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Implicit Transdisciplinary Affordances in Indonesia and Malaysia's National Curricula: Where Does Art Education Stand?

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ABSTRACT
Transdisciplinary pedagogy has gained increasing attention in curriculum studies as education systems respond to complex social, cultural, ecological, and technological challenges. However, national curricula do not always explicitly name transdisciplinarity, even when they contain structures that may support cross-disciplinary knowledge integration. This qualitative comparative case study examines how transdisciplinary affordances are articulated in Indonesia's Kurikulum Merdeka and Malaysia's Kurikulum Kebangsaan, with particular attention to the positioning of art education. Drawing on official curriculum documents, policy frameworks, learning outcome statements, and pedagogical guidelines, the study uses thematic document analysis to identify references to cross-curricular learning, project-based learning (PjBL), knowledge integration, creativity, and the arts. The findings show that neither curriculum explicitly adopts the term "transdisciplinary" ; however, both contain implicit affordances through mechanisms such as Indonesia's Projek Penguatan Profil Pelajar Pancasila (P5), learning phases, flexible subject choices, and Malaysia's Elemen Merentas Kurikulum (EMK), Pendekatan Bersepadu, higher-order thinking skills, and thematic integration. The comparison also reveals an important asymmetry. Indonesia positions art education more visibly as a site of interdisciplinary integration, whereas Malaysia distributes integrative expectations more broadly across cross-curricular and competency-based structures. The study argues that art education can serve as a generative epistemic space for transdisciplinary curriculum work, yet it also risks being instrumentalized if its intrinsic artistic, cultural, and critical value is subordinated to broader curriculum agendas.

KEYWORDS
Art education; comparative curriculum analysis; curriculum policy; Kurikulum Kebangsaan; Kurikulum Merdeka; transdisciplinary pedagogy

INTRODUCTION

In an era marked by rapid technological change, globalization, and complex societal challenges such as the climate crisis, inequality, and digital transformation, education must equip learners not only with technical or disciplinary knowledge but also with creative, reflective, and adaptive capacities. Art education is well-positioned to address these demands through its emphasis on aesthetic sensibility, imagination, emotional intelligence, empathy, and meaning-making (Başaran & Erol, 2023; Burnard et al., 2022). At the same time, it must remain open to collaboration with STEM, the social sciences, and the humanities so that it does not become siloed or disconnected from broader knowledge practices. Such openness enables art to cultivate learners who can think critically and imaginatively about complex real-world problems, integrate diverse modes of knowledge, and engage in culturally sensitive and socially responsible innovation. Conversely, non-art fields also benefit from artistic thinking through visualization, design thinking, storytelling, user-centered perspectives, visual literacy, collaboration, and empathy; research on STEAM education indicates that integrating the arts with STEM can promote innovation, enhance student engagement, and improve problem-solving skills (Hughes et al., 2022; Perales & Aróstegui, 2024). Okwara and Pretorius (2023) similarly argue that integrating the arts into science learning supports a transdisciplinary approach by connecting discovery, observation, experimentation, interpretation, visualisation, exploration, and communication across disciplinary practices. Previous research on Indonesian primary students' perceptions of art-science integration shows that learners may shift from viewing art and science as separate domains towards recognising similarities and connections between the two disciplines when they experience integrated thematic learning (Wulandari, 2020). However, the integration of art into other fields should not reduce art education to a merely instrumental or decorative function; rather, it should recognize it as a distinctive mode of inquiry, meaning-making, and knowledge production (Erbilgin et al., 2024).

This growing recognition of mutual benefit leads naturally to the concept of transdisciplinarity. Transdisciplinarity implies more than mere collaboration or integration between disciplines; it involves transcending traditional disciplinary boundaries, co-creating new frameworks of thought, and reimagining how knowledge is constructed and applied (Morton, 2025; Ndwandwe, 2024; Nicolescu, 2002). In curriculum terms, transdisciplinarity differs from multidisciplinarity and interdisciplinarity. Multidisciplinary approaches place disciplines side by side, while interdisciplinary approaches integrate methods or perspectives from different disciplines to address a common issue. Transdisciplinarity goes further by seeking to generate new understandings that move across and beyond disciplinary classifications, often in response to complex real-world problems. Much research emphasizes the benefits of integrating multiple disciplines to foster holistic and meaningful learning experiences (Barth et al., 2023). This approach marks a departure from traditional educational methods, which often maintain distinct subject boundaries, and advocates instead for cohesive and interconnected learning (Darbellay, 2015; Ertas, 2010; Park & Son, 2010; Rigolot, 2020). It acknowledges the

role of values, ethics, and the learner's positionality in shaping the educational process and outcomes, thereby promoting socially responsible and contextually relevant learning. However, implementing such pedagogy necessitates comprehensive collaboration across diverse fields of study, presenting significant practical challenges.

Beyond structural integration, the notion of valid knowledge is central to understanding the depth of transdisciplinary engagement. Transdisciplinary curricula require attention not only to how subjects are connected, but also to how knowledge is legitimized, constructed, and applied within specific educational contexts. Transdisciplinary education often aligns with a constructivist epistemology, particularly where learning is organised through inquiry, dialogue, and engagement with real-world problems; from this perspective, knowledge is not viewed as fixed content to be transmitted, but as something actively constructed by learners through experience, reflection, interaction, and the use of available interpretive resources (Boon et al., 2022; Kubisch et al., 2021; Taber, 2024). Such an epistemological stance emphasizes the co-creation of knowledge through collaborative integration of insights from multiple disciplines and learning agents. This is especially relevant to art education, where knowledge may emerge through visual, material, embodied, affective, cultural, and interpretive forms of learning. Research on museum-based learning in Indonesia and Malaysia further suggests that creative pedagogy can be strengthened through narratives, internal and external dialogues, experiential learning, and greater alignment between museum resources and school curriculum goals (Ambarwati et al., 2023).

To implement transdisciplinary principles in classroom practice, curriculum design acts as a key mediating framework. It serves as a strategic tool for aligning various educational components and fostering transdisciplinary learning (Allinson & Mahon, 2022; Marshall, 2014; Savage & Drake, 2016). National curricula in Indonesia and Malaysia, namely Kurikulum Merdeka and Kurikulum Kebangsaan, demonstrate efforts to adopt integrative approaches by standardizing educational practices across regions and academic levels. These frameworks aim to set consistent academic standards but are shaped by their socio-cultural and political environments, which influence how transdisciplinary pedagogy is interpreted and applied. While designed to address diverse academic needs, the extent to which these curricula provide explicit or implicit affordances for transdisciplinary learning warrants critical examination.

Understanding transdisciplinary affordances requires attention to how curriculum structures, pedagogical principles, and educational aims are articulated in policy documents (Allinson & Mahon, 2022; Lawrence, 2015). A well-designed curriculum can facilitate collaboration across subject areas, potentially dismantling traditional disciplinary barriers (Savage & Drake, 2016). The national curricula of Indonesia and Malaysia aim to uphold academic standards while catering to the unique socio-cultural and political needs of their populations, thereby enhancing the relevance of transdisciplinary approaches.

A notable gap in the literature is the lack of comparative research on how art education is positioned, framed, and connected to transdisciplinary affordances in Indonesia's Kurikulum

Merdeka and Malaysia's Kurikulum Kebangsaan. Most existing studies focus on single-country policy reform, creativity initiatives, arts integration, or museum-based learning (e.g., Ambarwati et al., 2023), without systematically investigating how art is positioned within transdisciplinary curricular elements in both nations. This gap is significant because the presence of cross-curricular, project-based, or competency-oriented mechanisms does not automatically indicate explicit transdisciplinarity; rather, such mechanisms may serve as affordances that enable transdisciplinary learning, depending on how the curriculum is structured, pedagogical principles are configured, and disciplinary boundaries are defined.

The study aims to examine how transdisciplinary affordances are articulated in Indonesia's Kurikulum Merdeka and Malaysia's Kurikulum Kebangsaan, and to analyze how art education is positioned within these affordances. The following research questions guide the study: 1) How are transdisciplinary affordances articulated in Indonesia's Kurikulum Merdeka and Malaysia's Kurikulum Kebangsaan? 2) Through which curriculum mechanisms are these affordances expressed? 3) Where does art education stand within these transdisciplinary affordances, and how does its positioning differ between the Indonesian and Malaysian national curricula?

METHOD

Research Design

The study adopts a qualitative comparative case study design, using document analysis as the primary method of data collection and analysis to examine curriculum policy as a complex, context-bound phenomenon situated within two national education systems: Indonesia's Kurikulum Merdeka and Malaysia's Kurikulum Kebangsaan (Baxter & Jack, 2008; Mtisi, 2022). The comparative orientation enables the study to identify similarities and differences in how transdisciplinary affordances are articulated across these two curriculum systems, rather than treating each curriculum as an isolated case. Document analysis was selected because official curriculum documents, policy frameworks, learning outcome statements, and pedagogical guidelines provide stable and traceable evidence of how curriculum intentions, concepts, and structures are formally represented (Bowen, 2009; Dalglish et al., 2020). This design is therefore suitable for analysing how transdisciplinary possibilities are embedded in policy discourse, curriculum structure, and pedagogical guidance, with particular emphasis on the positioning of art education. The study does not examine classroom implementation but focuses on curriculum documents as textual evidence of policy affordances that may enable, constrain, or shape transdisciplinary learning.

Document Corpus and Selection Criteria

The primary data sources consist of official curriculum documents, policy papers, and pedagogical guidelines issued by the respective Ministries of Education and related agencies in both countries. These documents cover various educational levels and provide comprehensive insights into the structural and philosophical foundations of each national curriculum. As

detailed in Table 2 (see appendix), these materials were selected based on the inclusion and exclusion criteria described in Table 1 (see appendix).

Data Collection and Unit of Analysis

Data collection occurred between June and November 2024, during which the documents listed above were systematically collected and organized for analysis. Each document was cataloged with a document code to ensure traceability during the analytical process. The unit of analysis comprised curriculum statements, policy clauses, learning outcome descriptors, pedagogical recommendations, and arts-related curriculum statements that addressed curriculum integration, cross-disciplinary learning, PjBL, real-world problem-solving, competency development, creativity, values education, or art education.

Data Analysis Process

The analytical process involved thematic coding to identify elements indicative of transdisciplinary affordances, such as interdisciplinary integration, PjBL, and fostering holistic competencies. Special attention was given to sections about art education to assess its positioning and potential as a conduit for transdisciplinary learning. The analysis was conducted in six stages. First, all documents were read repeatedly to establish familiarity with their curriculum philosophy, structure, and terminology. Second, relevant excerpts were identified through lexical and conceptual screening of terms related to transdisciplinarity, interdisciplinarity, cross-curricular learning, curriculum integration, PjBL, creativity, assessment, and art education. Third, deductive codes were developed from the literature on transdisciplinary pedagogy, curriculum integration, and arts-based learning. Fourth, inductive codes were generated from context-specific policy terms found in the Indonesian and Malaysian documents, including *lintas disiplin ilmu*, *lintas mata pelajaran*, Projek Penguatan Profil Pelajar Pancasila, Elemen Merentas Kurikulum, Pendekatan Bersepadu, and KBAT. Fifth, within-case analysis was conducted to examine each national curriculum separately. Finally, cross-case comparison was used to identify convergences, divergences, and tensions in the positioning of transdisciplinary affordances and art education across the two curriculum systems.

The analysis is informed by theoretical frameworks on transdisciplinary pedagogy and curriculum integration, drawing on established literature to contextualize the findings within broader educational discourses. This theoretical grounding enables a nuanced interpretation of how national curricula can either facilitate or hinder the adoption of transdisciplinary methodologies, particularly through the lens of art education.

Trustworthiness

Trustworthiness was addressed through several strategies to strengthen validity and reliability in the qualitative analysis. Credibility was supported by triangulating multiple official documents within each curriculum system, while dependability was ensured through an audit trail of document codes, analytical notes, coding categories, and comparative matrices. Confirmability was maintained by separating descriptive evidence from interpretation, and transferability by providing contextual detail. Original Indonesian, Malay, and English terms were retained to

reduce translation distortion, while acknowledging the findings concern policy affordances rather than classroom practice.

FINDINGS

The findings are organized around three analytical domains derived from the document analysis: terminological visibility, curriculum mechanisms, and the positioning of art education. These domains allow the comparison to move beyond a country-by-country description and instead identify how implicit transdisciplinary affordances are differently configured across the two national curricula. Table 4 provides an overview of the comparative findings, with subsequent sections elaborating on each domain in greater detail.

Terminological Visibility of Transdisciplinarity

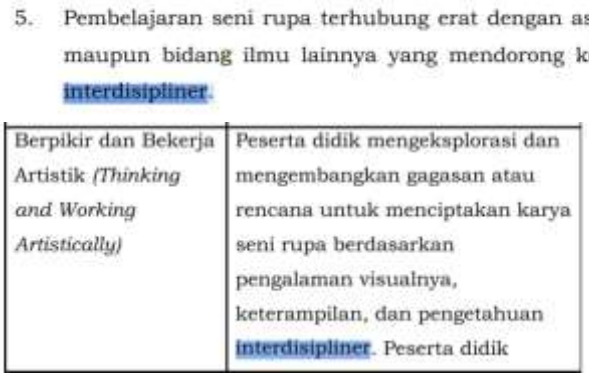
The first analytical domain examines whether, and how, the language of transdisciplinarity appears in the selected curriculum documents. Rather than treating the absence of the term "transdisciplinary" as evidence of absence, this section traces related policy terms that signal integrative, cross-curricular, interdisciplinary, or knowledge-connecting orientations.

Indonesia: Integrative Terminology without Explicit Transdisciplinary Labeling

The Kurikulum Merdeka framework in Indonesia appears to be rooted in an interdisciplinary philosophy, integrating knowledge from various academic fields and reflecting a transdisciplinary perspective. The term *interdisciplin* (interdisciplinary) appears in Document I.9, where it is mentioned nine times. However, this term is not used for general concepts or all subjects; it only describes the learning outcomes of visual arts and performing arts subjects starting from phase C (grades V and VI). It is stated that both subjects are closely linked to art and other scientific fields, thereby promoting interdisciplinary collaboration.

Figure 1.

The use of the interdisciplinary term in the Kurikulum Merdeka document as the learning outcome of visual and performing arts



5. Pembelajaran seni rupa terhubung erat dengan aspek seni maupun bidang ilmu lainnya yang mendorong kolaborasi interdisipliner.

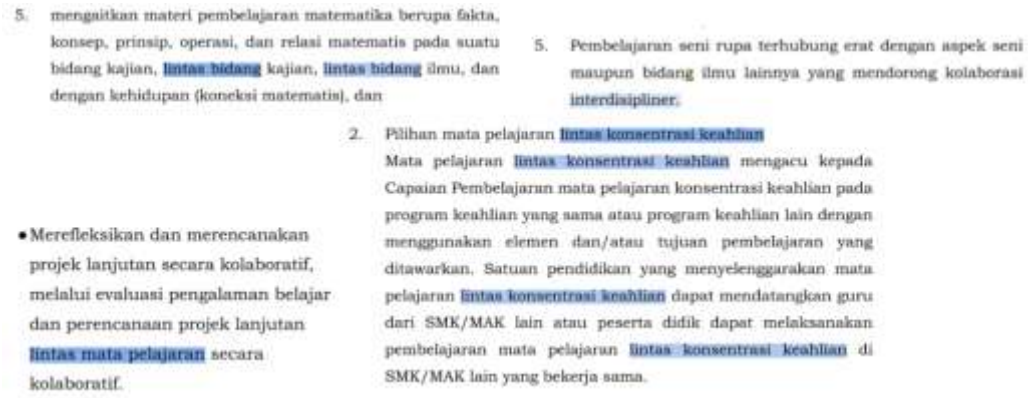
Berpikir dan Bekerja Artistik *(Thinking and Working Artistically)*	Peserta didik mengeksplorasi dan mengembangkan gagasan atau rencana untuk menciptakan karya seni rupa berdasarkan pengalaman visualnya, keterampilan, dan pengetahuan interdisipliner. Peserta didik

While the term "transdisciplinary" may not be explicitly used in all official documents, different terms are used, such as lintas bidang kajian (across fields of studies), lintas bidang ilmu (across fields of sciences), lintas mata pelajaran (across subjects), lintas kosentrasi keahlian (across expertise concentrations), as shown in the sample in Figure 1. One specific policy aimed

at facilitating the transdisciplinary concept is Projek Penguatan Profil Pelajar Pancasila, or P5 (Pancasila Student Profile Enhancement Project). In Documents I.4, I.5, and I.6, P5 is defined as 'collaborative learning across disciplines (lintas disiplin ilmu) in observing, exploring, and/or formulating solutions to real issues or problems relevant to students." There is also a more explicitly mentioned term, *multidiscipline* (multidisciplinary), as found in Document I.9. However, the study did not classify it as transdisciplinary due to a subtle difference in meaning. Multidisciplinary and transdisciplinary approaches emphasize integrating different areas of knowledge; however, in the transdisciplinary approach, there is an effort to develop a new understanding, theory, or axiom beyond disciplinary classifications (Ertas, 2010; Park & Son, 2010).

Figure 2.

Some terms used in the Kurikulum Merdeka documents related to transdisciplinary philosophy



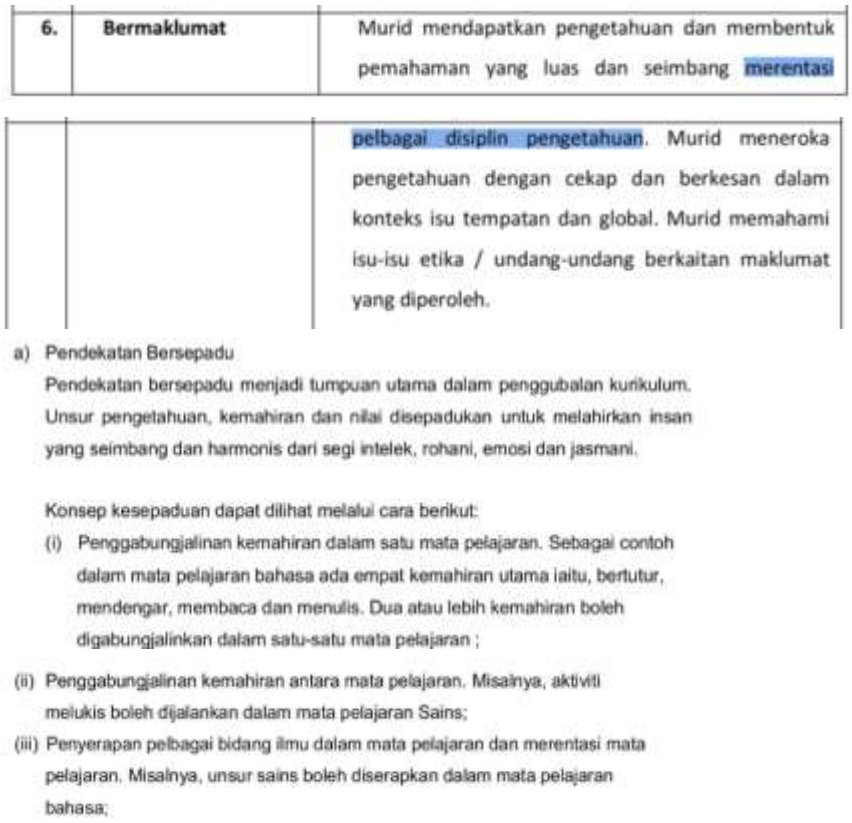
Malaysia: Cross-Curricular and Integrated Terminology without Explicit Transdisciplinary Labeling

Comparable trends can be observed in the Malaysian educational system. In the Kurikulum Kebangsaan, the term "transdisciplinary" is not directly used in official documents. However, the curriculum frameworks incorporate concepts akin to the transdisciplinary approach, for example, using another term such as merentasi pelbagai disiplin pengetahuan. This term refers to "across various disciplines of knowledge," a quality of the Bermaklumat (informative) student profile, in which students should gain knowledge and form a broad and balanced understanding (Document M.5, pages 42-43). The same term also appears with a more explicit meaning in Document M.4, relating to the Pendekatan Bersepadu (integrated learning approach). It is stated that the concept of kesepaduan (unity) in Pendekatan Bersepadu "can be seen through the following ways: .... (ii) Combining skills between subjects (penggabungjalinan kemahiran antara mata pelajaran). For example, drawing activities can be carried out in science subjects; (iii) Absorption of various fields of knowledge in subjects and across subjects (merentasi mata pelajaran). For example, elements of science can be incorporated in language subjects; ...." (Document M.4, pages 4-5). The Malaysian curriculum framework's emphasis on integrating

knowledge, skills, and concepts across subject areas resonates with the principles of transdisciplinary education.

Figure 3.

Some terms used in the Kurikulum Kebangsaan documents related to transdisciplinary philosophy



6.	**Bermaklumat**	Murid mendapatkan pengetahuan dan membentuk pemahaman yang luas dan seimbang merentasi pelbagai disiplin pengetahuan. Murid meneroka pengetahuan dengan cekap dan berkesan dalam konteks isu tempatan dan global. Murid memahami isu-isu etika / undang-undang berkaitan maklumat yang diperoleh.

a) Pendekatan Bersepadu

Pendekatan bersepadu menjadi tumpuan utama dalam penggubalan kurikulum. Unsur pengetahuan, kemahiran dan nilai disepadukan untuk melahirkan insan yang seimbang dan harmonis dari segi intelek, rohani, emosi dan jasmani.

Konsep kesepaduan dapat dilihat melalui cara berikut:

(i) Penggabungjalinan kemahiran dalam satu mata pelajaran. Sebagai contoh dalam mata pelajaran bahasa ada empat kemahiran utama iaitu, bertutur, mendengar, membaca dan menulis. Dua atau lebih kemahiran boleh digabungjalinkan dalam satu-satu mata pelajaran ;

(ii) Penggabungjalinan kemahiran antara mata pelajaran. Misalnya, aktiviti melukis boleh dijalankan dalam mata pelajaran Sains;

(iii) Penyerapan pelbagai bidang ilmu dalam mata pelajaran dan merentasi mata pelajaran. Misalnya, unsur sains boleh diserapkan dalam mata pelajaran bahasa;

Curriculum Mechanisms that Generate Implicit Transdisciplinary Affordances

While the term "transdisciplinary" may not be explicitly stated in the curricula of Indonesia and Malaysia, elements of transdisciplinary learning are present to varying degrees. This suggests that transdisciplinary integration exists along a continuum, ranging from implicit practices to explicit frameworks. For instance, specific PjBL initiatives may naturally foster cross-disciplinary connections without being formally labeled as transdisciplinary. Recognizing this spectrum allows for a more comprehensive understanding of how transdisciplinary approaches are embedded within educational practices, even if not overtly acknowledged.

Indonesia: P5, Learning Phases, Flexible Pathways, and Project-Based Learning

The Kurikulum Merdeka incorporates several key elements that align with the philosophy of transdisciplinarity. This philosophy fosters a holistic learning experience that integrates knowledge and skills beyond disciplines. The following components of the Kurikulum Merdeka reflect this philosophy.

Projek Penguatan Profil Pelajar Pancasila (P5 – Pancasila Student Profile Enhancement Project)

The P5 curriculum, one of the most clearly defined curricula that accommodate transdisciplinary learning experiences, is designed to integrate learning across subjects and connect them to the

real-world applications of Pancasila values, such as social responsibility, collaboration, and cultural understanding. In practice, the time allocation for P5 is 20%–30% of each subject in the curriculum, with its implementation combined across all subjects. Therefore, philosophically, P5 serves as a meeting place for various knowledge domains that are dynamically utilized together. Through this framework, students engage in projects focused on environmental sustainability, community development, civic engagement, and other areas, requiring them to draw on knowledge from diverse academic fields. By emphasizing the resolution of complex societal problems, P5 naturally fosters a transdisciplinary approach. Through this integrative framework, students acquire academic knowledge and cultivate a deeper understanding of societal values and global challenges.

Learning Phases

In the Kurikulum Merdeka, Capaian Pembelajaran (CP – Learning Outcomes) is organized through Fase Pembelajaran (Learning Phases), which represent stages of student development across age groups and education levels. Rather than measuring achievement solely by grade-level competencies, this structure allows learning to be viewed in terms of broader developmental progress and the holistic profile expected in each phase. It also supports a more individualized approach, enabling teachers to adjust strategies according to students' needs, specializations, and learning trajectories, and supports responsiveness to students' diverse learning rhythms. Students are encouraged to apply general, 21st-century, and discipline-based skills across varied contexts, rather than mastering isolated facts within separate subjects. Consequently, learning phases create curricular space for teachers to design activities that connect knowledge from different disciplines and relate it to real-life situations. Depending on students' development, materials from different phases and subjects can be integrated to support more flexible and meaningful learning. This flexibility also allows evidence of learning to be viewed more holistically, particularly when students demonstrate their ability to connect knowledge, skills, and attitudes through projects, presentations, and collaborative tasks. In this sense, the learning phase structure in Kurikulum Merdeka provides an important affordance for interdisciplinary and potentially transdisciplinary learning, as it encourages the application of knowledge across contexts rather than rigid progression within the boundaries of isolated subjects.

Flexibility in Learning Pathways

The Kurikulum Merdeka emphasizes the implementation of differentiation-based education, which, upon analysis, is grounded in differentiated instruction theory (Pozas et al., 2020). Moving from exclusive to inclusive education, the Kurikulum Merdeka aims to create a more equitable and accessible learning environment that caters to the diverse needs and abilities of all students. It allows for greater flexibility in organized learning, enabling teachers to tailor learning experiences to students' needs and specializations.

Overall, the educational journey in the Kurikulum Merdeka shows flexibility, especially at the senior high school (SMA) level. Under the previous curriculum, the SMA study streams were

divided into three: Natural Science, Social Studies, and Language. In the Kurikulum Merdeka, these interest divisions were slightly revised to serve as a mechanism for regulating subject selection in SMA (Document I.9, page 60). In this rule, specializations are no longer a compartmentalized program but a selection of subjects according to students' needs, specializations, talents, and aspirations. Starting from grade 11 SMA, students are required to take subjects from the general subject group, such as Religion, Bahasa Indonesia, Pancasila, etc., and choose elective subjects from four groups of disciplines: MIPA (natural sciences), IPS (social sciences), Languages and Culture, and Prakarya (Crafts)/Vocation. Each student may flexibly choose four subjects from at least two groups of elective subjects. In other words, students now select individual subjects rather than pathway programs, meaning there are no longer tracks or groupings based on students' choices.

Project-Based Learning and Problem-Based Learning (PBL)

PjBL and PBL are central to the Kurikulum Merdeka. These learning approaches encourage students to explore real-world issues or challenges that transcend a single subject area. With the inclusion of PjBL in the curriculum structure, activities oriented toward general competencies or transversal skills that support character development are integrated into the learning process that all students must undertake (Document I.3, page 29). In practice, students must integrate knowledge and skills from various disciplines, such as science, technology, social studies, and language, toward a unified goal. This approach breaks down the traditional boundaries between subjects, promoting the synthesis of knowledge and ideas.

Malaysia: EMK, KBAT, Pendekatan Bersepadu, STEM, and Thematic Integration

The Kurikulum Kebangsaan incorporates several elements that align with the philosophy of transdisciplinarity, though the term itself may not be explicitly stated. The following aspects support the transdisciplinary philosophy.

Elemen Merentas Kurikulum (EMK – Cross Curriculum Elements)

EMK refers to components or elements of education that are cross-disciplinary and integrated across all subjects. These elements aim to ensure that vital aspects of education, such as moral values, critical thinking, and life skills, are integrated holistically into the learning process. In other words, EMK is not taught in isolation but is seamlessly integrated into teaching all school subjects. It is stated that "The concept of unity can be seen through the following ways: .... (v) Elements across the curriculum include language, environment, science and technology, patriotism, thinking skills, learning skills, entrepreneurship, ICT, creativity and innovation, ..." (Document M.4, pages 4-5). The overarching goal of EMK is to develop holistic competencies, instill positive values and attitudes, and strengthen cross-disciplinary connections.

EMK policy aligns with the educational emphasis on 21st-century skills, such as critical thinking, creativity, collaboration, and communication, which are inherently transdisciplinary. These skills are integrated across various subjects, prompting students to apply knowledge from multiple fields when addressing complex challenges. The focus is to prepare students for a rapidly changing world of interconnected knowledge and multidimensional problems.

Additionally, this policy promotes Kemahiran Berfikir Aras Tinggi (KBAT), or higher-order thinking skills, encouraging students to think critically and creatively and to make connections across different disciplines. KBAT aims to develop students' ability to analyze, evaluate, and synthesize information from various subjects, a core aspect of transdisciplinary learning.

Pendekatan Bersepadu (Integrated Learning Approach)

The Pendekatan Bersepadu is a central teaching and learning strategy in the Kurikulum Kebangsaan. This approach integrates academic content, skills, and values from different disciplines, fostering a holistic, interconnected understanding of knowledge that transcends traditional subject boundaries. The key features of the Pendekatan Bersepadu include integrated subjects, thematic instruction, student-centered learning, cross-disciplinary skills, the integration of values and ethics, and lifelong learning. The Pendekatan Bersepadu represents a holistic, integrated approach to education. It merges academic content with the development of values, ethics, and 21st-century skills, preparing students for the complexities of the contemporary world. The Pendekatan Bersepadu equips students with the knowledge and competencies they need to succeed in local and global contexts by fostering interdisciplinary connections and promoting active learning.

Pendidikan STEM (Science, Technology, Engineering, Mathematics Education) and Thematic Integration

STEM education is a crucial initiative in the Kurikulum Kebangsaan that supports interdisciplinary learning by integrating science, technology, engineering, and mathematics into cohesive learning experiences. Document I.2: The ministry will strive to lay the foundation at the school level to ensure that the country has a sufficient number of qualified STEM graduates to meet the needs of the industrial workforce and drive the Malaysian economy. STEM is applied in various subjects, including Reka Bentuk dan Teknologi (Design and Technology). Figure 2 exemplifies the implementation of a STEM-based transdisciplinary philosophy. In applying technology, students must "Learn and apply technology in a design that includes various disciplines" (Document M.4, page 144). STEM education encourages students to apply concepts from multiple disciplines to solve real-world problems, reflecting a transdisciplinary approach to learning. This enables students to ask questions, explore their environment through inquiry-based learning, and solve real-world problems, thereby cultivating STEM practices.

The findings reveal that both the Kurikulum Merdeka and Kurikulum Kebangsaan utilize flexible learning pathways, integrated curricula, and PjBL approaches that align with the principles of transdisciplinary pedagogy. These curriculum elements are interconnected learning experiences that transcend the boundaries of traditional disciplines.

While there is an evident overlap between interdisciplinary and transdisciplinary approaches, it is crucial to recognize their distinct properties. Interdisciplinary refers to the integration of knowledge and methods from different disciplines, whereas transdisciplinary goes beyond this, creating a unified framework that transcends the boundaries of individual disciplines (Darbellay, 2015; Liao, 2016). Neither curriculum explicitly mentions “transdisciplinary,” as its structure

remains predominantly discipline-based. Consequently, when students select subjects, they tend to combine several disciplines. However, from the perspective of real-world problem-based projects adopted as learning strategies, it can be seen that the existing learning can lead students to a transdisciplinary understanding as they interpret their learning experiences. For instance, in P5, students strive to create projects by utilizing various information and skills without labeling and classifying them into particular disciplines.

Figure 4.

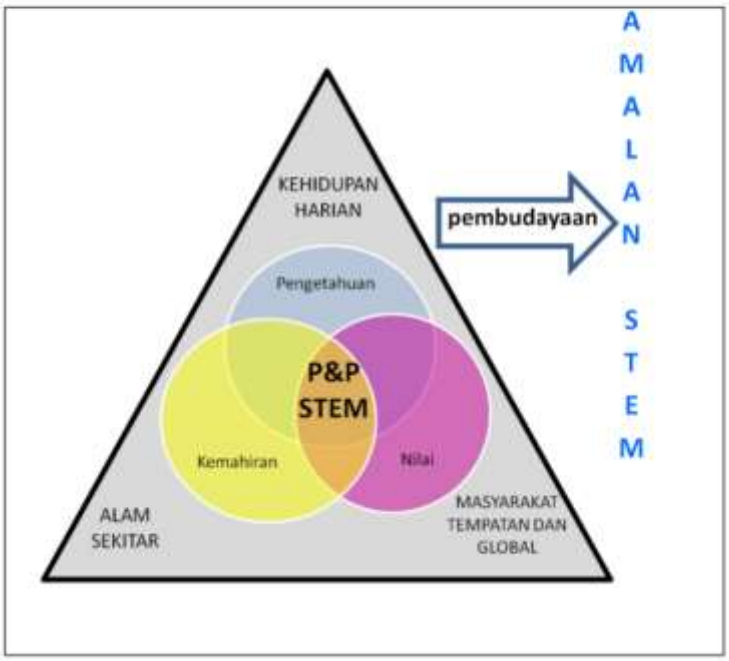
STEM in Kurikulum Kebangsaan

- Pedagogi menekankan kepada pembelajaran secara mendalam melalui pendekatan pengajaran dan pembelajaran (p&p) yang berasaskan kemahiran berfikir aras tinggi (KBAT). Fokus diberikan kepada pembelajaran berasaskan inkuiri, penyelesaian masalah, pembelajaran kontekstual, pembelajaran kolaboratif, pembelajaran berasaskan projek dan pendekatan STEM.

Murid yang mengikuti p&p di bawah KSSM dilengkapi kemahiran yang diperlukan untuk menghadapi cabaran dunia yang sentiasa berubah dalam arus kemajuan dengan mengaplikasi pengetahuan, kemahiran dan nilai yang terdapat dalam bidang *Science, Technology, Engineering and Mathematics* (STEM).Tumpuan diberikan kepada peningkatan kemahiran STEM pengukuhan asas program sedia ada dan menggalakkan murid peringkat menengah atas dan lepas menengah untuk mengikuti STEM.

Pendekatan STEM

Pendekatan STEM melibatkan pengaplikasian pengetahuan, kemahiran dan nilai STEM untuk menyelesaikan masalah dalam konteks kehidupan harian, masyarakat dan alam sekitar seperti dalam Rajah 2.



The Position of Art Education within Curriculum Integration

Art education in Indonesia's and Malaysia's curricula reflects an evolving pedagogical role beyond producing artistic objects. Indonesia positions art more visibly as interdisciplinary

integration, whereas Malaysia embeds it within broader mechanisms of creativity, visual literacy, cultural appreciation, KBAT, STEM, and thematic integration.

Indonesia: Art Education as a Visible Site of Interdisciplinary and Creative Integration

In the Indonesian Kurikulum Merdeka context, art and performing arts serve as visible platforms for integrative pedagogy, as they are explicitly linked to interdisciplinary learning outcomes. This suggests that the arts are treated as flexible curricular spaces through which students can connect artistic practice with culture, science, environment, technology, and social life. Art education, therefore, becomes a concrete site where interdisciplinary and potentially transdisciplinary learning can be operationalized.

This role is most evident in PjBL and Projek Penguatan Profil Pelajar Pancasila (P5). Within these initiatives, art is not merely decorative or illustrative, but functions as a generative medium of inquiry. Students may examine real-world issues such as environmental sustainability, cultural diversity, community life, and social responsibility through visual representations, performances, collaborative artifacts, and other creative outputs. In this process, artistic production becomes a way of interpreting, synthesizing, and communicating knowledge across domains.

Creating visual representations, performances, or collaborative artifacts also becomes an epistemic process that crosses subject boundaries. For example, when students develop two- or three-dimensional responses to environmental or social issues, they combine aesthetic judgment with contextual knowledge, ethical awareness, material understanding, and critical reflection. The transdisciplinary potential of P5 is therefore visible when artistic work requires broader social, cultural, and scientific understanding.

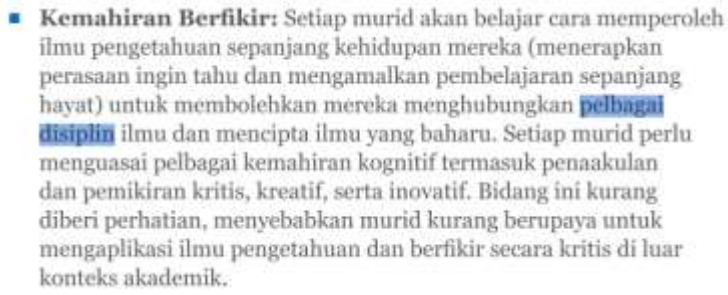
Document I.9 and related guidance indicate that artistic learning may be connected with other disciplinary areas, including science, cultural studies, material exploration, environmental awareness, and local knowledge. This positioning also affirms the arts as a legitimate space for meaning-making within curriculum integration processes. Thus, in Kurikulum Merdeka, art education functions both as a disciplinary subject and as a pedagogical bridge for integrated learning.

Malaysia: Art Education within Creativity, Visual Literacy, Cultural Appreciation, and Integrated Learning

In Malaysia's Kurikulum Kebangsaan, art education reflects transdisciplinary principles, although it is usually framed in terms of "integration" and "thematic learning." Rather than assigning the integrative role mainly to art education, the curriculum distributes integration across wider mechanisms, including Elemen Merentas Kurikulum (EMK), Pendekatan Bersepadu, KBAT, STEM-related learning, and thematic instruction. Within this structure, art education contributes to creativity, visual literacy, aesthetic appreciation, cultural understanding, and the application of knowledge across contexts.

Figure 5.

Learning outcomes supported through the arts



- **Kemahiran Berfikir:** Setiap murid akan belajar cara memperoleh ilmu pengetahuan sepanjang kehidupan mereka (menerapkan perasaan ingin tahu dan mengamalkan pembelajaran sepanjang hayat) untuk membolehkan mereka menghubungkan pelbagai disiplin ilmu dan mencipta ilmu yang baharu. Setiap murid perlu menguasai pelbagai kemahiran kognitif termasuk penaakulan dan pemikiran kritis, kreatif, serta inovatif. Bidang ini kurang diberi perhatian, menyebabkan murid kurang berupaya untuk mengaplikasi ilmu pengetahuan dan berfikir secara kritis di luar konteks akademik.

The curriculum emphasizes 21st-century skills, including creativity, critical thinking, and problem-solving, which are nurtured through art learning. Students are encouraged to interpret images, communicate ideas visually, appreciate cultural heritage, and connect artistic knowledge with everyday life, different fields, and future careers (Document M.4). This indicates that art education is not isolated from broader educational aims, but contributes to holistic and adaptable learner development.

Although STEAM is not officially recognized, the relationship between artistic learning and STEM-related curriculum areas may support comparable pedagogical purposes. Visual art can contribute to design thinking, representation, interpretation, creativity, and problem-solving within integrated or thematic learning contexts. The curriculum also promotes thematic learning, where art connects subjects such as history, geography, science, technology, culture, and environmental studies. Students may create artworks based on historical events, local culture, ecological change, technological development, or social themes. Although art has become an elective subject at the senior secondary level for Sijil Pelajaran Malaysia (SPM), KSSR, and KSSM still emphasize its contribution to KBAT. Thus, art education in Malaysia occupies an important but more dispersed position within creativity, integration, and competency development. Its role is therefore significant, but less explicitly foregrounded than in Indonesia's art curriculum, where interdisciplinary outcomes are more directly named and visible.

DISCUSSION

Transdisciplinarity as an Implicit Curriculum Affordance

The findings show that neither Indonesia's Kurikulum Merdeka nor Malaysia's Kurikulum Kebangsaan explicitly adopts transdisciplinarity as a formal label. Nevertheless, both curricula contain structures that enable learning across and beyond disciplinary boundaries. This supports the argument that transdisciplinarity in both systems should be understood as an implicit affordance rather than an explicit policy category. Recent literature likewise suggests that transdisciplinary education is not merely a matter of combining subjects but entails designing conditions in which learners engage with complex problems, integrate heterogeneous knowledge, and move beyond conventional disciplinary classifications (Daneshpour & Kwegyir-Afful, 2022).

This distinction is important. An affordance does not automatically become practice; it indicates that the curriculum creates possibilities for learning, but these possibilities remain contingent on how disciplinary boundaries, pedagogical expectations, and institutional arrangements are configured. Recent research on arts teachers' planning under Kurikulum Merdeka also indicates that curricular flexibility does not automatically produce deep pedagogical plurality, as differentiated arts learning may remain limited to surface variation unless it is translated into meaningful learning design (Wulandari et al., 2026). Farihen et al. (2026) warn that policy intentions may become fragmented when curriculum enactment is shaped by administrative compliance rather than meaningful learning and contextual pedagogical judgement. Studies on transdisciplinary curriculum design emphasize that real-world problem orientation, PjBL, co-creation, and contextual relevance must be embedded to make transdisciplinary intentions meaningful educational experiences (Tasdemir & Gazo, 2020; Gulikers et al., 2025). In Indonesia, these affordances are visible through P5, PjBL, flexible pathways, and arts-related interdisciplinary learning outcomes. In Malaysia, they are distributed through EMK, Pendekatan Bersepadu, KBAT, STEM-related learning, and thematic integration. Both systems move beyond narrow disciplinary transmission, but through different policy architectures: Indonesia foregrounds a project- and values-oriented model, whereas Malaysia relies more on cross-curricular and competency-based integration.

Art Education as an Epistemic Bridge

The positioning of art education in both systems illustrates its dual identity, as a bridge for transdisciplinary synthesis and as a subject that may be overburdened with integrative expectations. As an epistemic bridge, art education enables learners to connect visual, material, embodied, cultural, emotional, ethical, and conceptual forms of knowledge. Arts-based pedagogy can also create dialogic and culturally situated spaces for curriculum development, positioning art forms as expansive, generative, and epistemically meaningful modes of communication rather than merely expressive products (Huxley, 2025). This argument resonates with recent STEAM scholarship, which positions the arts not as an accessory to STEM but as a mode through which learners interpret, represent, and make sense of complex phenomena (Burnard et al., 2022; Guyotte et al., 2014, Perales & Aróstegui, 2024). Through images, artifacts, performances, design processes, and aesthetic judgment, students can translate abstract ideas into visible, tangible, and affective forms.

Beyond its structural role, art education in both curricula suggests a shift in how knowledge is conceived. These curricular practices indicate a movement towards constructivist and embodied understandings of learning, in which knowledge is actively constructed through inquiry, interpretation, collaboration, material engagement, and real-world problem-solving (Strakšienė et al., 2022). Visual art-based STEAM research further shows that the visual arts can support observation, association, interpretation, critical thinking, design-based inquiry, and the communication of ideas that may be difficult to express verbally (Zhang & Jia, 2024). In this sense, art education is not merely a vehicle for expression, but a mode of knowing.

Such an epistemological stance aligns closely with the foundational aims of transdisciplinary pedagogy. Through art, students may engage with local culture, ecological concerns, technological change, and social issues in ways that connect cognition, imagination, and values. However, this role also requires caution. Recent reviews of integrated STEAM education warn that the arts are sometimes included instrumentally, with limited attention to artistic competencies or the intrinsic value of art education (Sanz-Camarero et al., 2023, 2025). Therefore, the distinctive contribution of art education lies not only in supporting integration but in expanding what counts as knowledge within transdisciplinary curriculum work.

Between Integration and Instrumentalization

Although art education has strong integrative potential, its curriculum positioning also raises critical concerns. Recent scholarship on integrated and STEAM education warns that the inclusion of the arts does not automatically guarantee meaningful arts integration; it may instead reproduce the instrumentalization or undervaluation of art if artistic knowledge is treated merely as a support mechanism for other subjects (Sanz-Camarero et al., 2023, 2025). Ensuring that this role is balanced with an appreciation for the intrinsic aesthetic, cultural, and epistemic value of the arts is therefore a key consideration for curriculum designers and educators. If art is valued only because it illustrates science, decorates project outputs, or increases student engagement, it risks being reduced to a service discipline rather than being recognized as a rigorous field of inquiry in its own right.

This concern is particularly visible in the Indonesian context, where art and performing arts are explicitly associated with interdisciplinary learning outcomes. This designation underscores confidence in art's flexibility and a systemic expectation that the arts shoulder the integrative mandate. However, it also raises questions of curricular equity. If integration is considered valuable for art education, it should also be considered relevant to science, language, social studies, mathematics, and technology. In this respect, transdisciplinary curriculum work should avoid positioning the arts as the only flexible or integrative domain. As Burnard et al. (2022) argue, arts and sciences in transdisciplinary education should be understood as co-constitutive rather than hierarchically arranged.

This asymmetry invites epistemological reflection: is the integration of knowledge seen as an artistic strength or as a functional obligation imposed on a supposedly "less rigorous" discipline? The question is not whether art should participate in transdisciplinary learning; it should. The more important issue is whether the responsibility for integration is distributed fairly across the curriculum. The Malaysian curriculum mitigates this risk to some extent by distributing integrative expectations through EMK, Pendekatan Bersepadu, KBAT, STEM-related learning, and thematic integration. However, Malaysia also faces another risk: art education may become less visible if its distinctive aesthetic, cultural, and epistemic role is absorbed into general creativity, STEM, or competency-based agendas. Therefore, the challenge for both curricula is to promote integration without weakening the disciplinary dignity and knowledge contribution of art education (Perales & Aróstegui, 2024; Strakšienė et al., 2022).

Limitations

The study has several limitations. First, it relies on curriculum documents, policy frameworks, learning outcome statements, and pedagogical guidelines; therefore, the findings should be understood as an analysis of curriculum positioning and policy affordances rather than evidence of classroom enactment. Second, because the study focuses on national-level documents, it does not capture regional adaptations, school-level curriculum interpretation, teacher practices, student experiences, or local learning materials. Third, although the Indonesian and Malaysian documents were selected for comparability, the curriculum systems differ in policy history, terminology, institutional structure, and document organization, which may affect the symmetry of comparison. Fourth, the analysis involves Indonesian, Malay, and English terms; while original terms were retained to preserve nuance, some meanings may remain context-specific and not fully transferable across languages. Finally, the study reflects the curriculum documents available at the time of data collection, and subsequent policy revisions or guidelines may reshape how transdisciplinary affordances and art education are positioned in both national curricula.

CONCLUSION

The study identifies implicit transdisciplinary affordances in the national curricula of Indonesia and Malaysia, with a focus on the positioning of art education. Although “transdisciplinary” is rarely named explicitly, both curricula promote integrative orientations through policy language, curricular mechanisms, and pedagogical structures that support interdisciplinary and cross-curricular learning. These affordances differ in configuration: Kurikulum Merdeka foregrounds project-based, values-oriented, flexible, and arts-linked structures through P5, learning phases, subject flexibility, and interdisciplinary art outcomes, whereas Kurikulum Kebangsaan distributes integration through EMK, Pendekatan Bersepadu, KBAT, STEM-related learning, competency-oriented structures, and thematic approaches. Thus, art education occupies a strategic but uneven position, appearing more visible in Indonesia and more dispersed in Malaysia, while functioning across both systems as an epistemic bridge linking aesthetic, cultural, ethical, scientific, and social knowledge within wider transdisciplinary curriculum possibilities and debates. It shows that the value of art education in transdisciplinary curriculum work lies not only in its capacity to support integration but also in its distinctive artistic, cultural, and critical contribution. Future curriculum development in both contexts would benefit from a clearer articulation of transdisciplinary affordances, a more balanced distribution of integrative expectations across subjects, and stronger recognition of the intrinsic value of art education within national curriculum frameworks.

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The authors declare that this study did not involve human participants; therefore, informed consent was not required.

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APPENDIX

Table 1.

Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
1. Official documents issued by the Ministry of Education or relevant national curriculum agencies. 2. Documents directly related to national curriculum frameworks, curriculum philosophy, learning outcomes, pedagogical guidelines, assessment, cross-curricular elements, or art education. 3. Documents representing national-level curriculum policy. 4. Documents containing evidence of curriculum integration, PjBL, cross-disciplinary learning, values education, competency development, creativity, or the positioning of art education. 5. Documents publicly accessible and traceable through official or recognized institutional sources. 6. Indonesian and Malaysian documents with functionally comparable policy roles.	1. Non-official commentaries, media reports, opinion pieces, blog posts, or secondary interpretations of curriculum policy. 2. School-level curriculum documents, local adaptations, or individual lesson plans. 3. Teacher-generated modules, classroom worksheets, or instructional materials are not issued as national policy guidance. 4. Documents that do not address curriculum structure, pedagogy, assessment, cross-curricular learning, competency development, or art education. 5. Materials lacking sufficient publication details, institutional authorship, or traceable provenance. 6. Documents that were superseded, inaccessible, or not functionally comparable with the selected corpus.

Table 2.

Documents Analyzed

Doc. code	*Documents of Indonesia – Kurikulum Merdeka*
I.1	Kurikulum Merdeka Website (Kemendikbudristek, 2024a)
I.2	Ministry of Education and Culture Strategic Plan 2020–2024 (Permendikbud RI No. 22 Tahun 2020 tentang Rencana Strategis Kementerian Pendidikan dan Kebudayaan Tahun 2020-2024, 2020)
I.3	Academic Review: Curriculum for Learning Recovery (Kemendikbudristek, 2022)
I.4	The Curriculum for Early Childhood Education, Primary Education, and Secondary Education (Permendikbudristek RI No. 12 Tahun 2024 tentang Kurikulum pada PAUD, Jenjang Pendidikan Dasar, dan Jenjang Pendidikan Menengah, 2024)
I.5	Guidelines for Development: Curriculum of Educational Units (Kemendikbudristek, 2024c)
I.6	Guideline for Development: P5 (Pancasila Student Profile Enhancement Project) (Kemendikbudristek, 2024d)
I.7	Guidelines: Learning and Assessment for Early Childhood Education, Primary Education, and Secondary Education (Kemendikbudristek, 2024b)
I.8	Dimensions, Elements, and Subelements of the Pancasila Student Profile in the Kurikulum Merdeka (Keputusan KBSKAP Kemendikbudristek Nomor 009/H/KR/2022 Tentang Dimensi, Elemen Dan Subelemen Profil Pelajar Pancasila Pada Kurikulum Merdeka, 2022)
I.9	Learning Outcomes (Keputusan KBSKAP Kemendikbudristek Nomor 032/H/KR/2024 Tentang Capaian Pembelajaran Pada PAUD, Jenjang Pendidikan Dasar, Dan Jenjang Pendidikan Menengah Pada Kurikulum Merdeka, 2024)
Doc. code	*Documents of Malaysia – Kurikulum Kebangsaan*
M.1	Ministry of Education Website (Kementerian Pendidikan Malaysia, 2024)
M.2	Malaysia Education Blueprint 2013-2025 (Kementerian Pendidikan Malaysia, 2013)
M.3	National Education Policy (Kementerian Pendidikan Malaysia, 2017a)

M.4	Primary School Standard Curriculum (KSSR): Subject Curriculum Framework (Kementerian Pendidikan Malaysia, 2017b)
M.5	Middle School Standard Curriculum (KSSM) Description Book (Kementerian Pendidikan Malaysia, 2016)
M.6	Primary School Standard Curriculum (KSSR) for Visual Art Education: Standard Curriculum and Assessment Document (Kementerian Pendidikan Malaysia, 2019)

Table 3.

Coding Framework

Code	Analytical focus	Examples of evidence examined
TD1	Explicit or implicit terminology related to transdisciplinary learning	Terms such as transdisciplinary, interdisciplinary, multidisciplinary, cross-curricular, *lintas disiplin ilmu*, *lintas mata pelajaran, merentas kurikulum*, and *merentasi pelbagai disiplin pengetahuan*
TD2	Real-world problem orientation	References to sustainability, citizenship, community issues, social responsibility, environmental concerns, cultural identity, and problem-solving
TD3	Knowledge integration	Statements indicating the integration of knowledge, skills, values, subjects, disciplines, or learning domains
TD4	Curriculum mechanisms	P5, EMK, Pendekatan Bersepadu, learning phases, flexible subject choices, thematic learning, KBAT, STEM, and PjBL
TD5	Position of art education	References to visual art, creativity, cultural expression, aesthetic inquiry, visual literacy, material practice, and arts integration
TD6	Tensions and constraints	References or interpretive evidence related to monodisciplinary traditions, STEM dominance, disciplinary hierarchy, and instrumentalization of art education

Table 4.

Comparative Findings on Implicit Transdisciplinary Affordances in Indonesian and Malaysian National Curricula

Analytical domain	Indonesia's Kurikulum Merdeka	Malaysia's Kurikulum Kebangsaan	Comparative interpretation
Terminological visibility	The curriculum does not explicitly use transdisciplinary, but selected documents use *interdisiplin, lintas disiplin ilmu, lintas mata pelajaran, lintas bidang kajian*, and *multidisiplin*.	The curriculum avoids the term transdisciplinary but uses expressions such as *merentas kurikulum, merentasi pelbagai disiplin pengetahuan*, Pendekatan Bersepadu, and cross-curricular integration.	Both curricula articulate integrative orientations without formalizing transdisciplinarity; it therefore operates as an implicit policy affordance.
Main curriculum mechanisms	Affordances are expressed through P5, learning phases, competency-based outcomes, PjBL, and flexible subject choices at upper secondary level.	Affordances are expressed through EMK, Pendekatan Bersepadu, KBAT, STEM initiatives, thematic learning, and KSSR/KSSM structures.	Indonesia foregrounds project-based, values-oriented, and student-profile mechanisms, while Malaysia distributes integration through cross-curricular, integrated, and competency-based structures.

Real-world problem orientation	P5 provides space for sustainability, citizenship, cultural identity, social responsibility, and community-based problem-solving.	Real-world relevance is embedded through EMK, STEM, KBAT, environmental awareness, entrepreneurship, ICT, and thematic learning.	Both curricula connect learning to real-world concerns, but Indonesia offers a project-based approach, whereas Malaysia embeds relevance across broader structures.
Knowledge integration	Knowledge integration is encouraged through cross-disciplinary projects, flexible pathways, interdisciplinary arts outcomes, and opportunities to combine subjects across conventional groupings.	Integration is encouraged through principles of integrated curriculum, cross-curricular elements, thematic teaching, STEM, and links among skills across subjects.	Both systems support knowledge integration: Indonesia is project-based, whereas Malaysia is embedded across curriculum elements and subjects.
Position of art education	Art education is positioned as a site for interdisciplinary learning through creativity, visual expression, cultural inquiry, projects, and arts–knowledge connections.	Art education contributes to creativity, appreciation, cultural understanding, visual literacy, integrated learning, and higher-order thinking, but its transdisciplinary role is less foregrounded.	Art education is strategic but uneven: Indonesia links it more visibly to interdisciplinary outcomes, while Malaysia disperses its integrative potential across broader mechanisms.
Key tension	Art education may be overburdened as a flexible space for integration and reduced to a vehicle for broader agendas.	Art education may be subordinated within STEM, competency, or cross-curricular agendas if its aesthetic, cultural, and creative contributions are not explicit.	Both curricula need to protect art's intrinsic value while recognizing its capacity to connect aesthetic, cultural, ethical, scientific, and social knowledge.