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Practical pathways for fostering creativity in elementary art education: A systematic literature review

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Abstract

This study systematically reviews the teaching methods of cultivating students' creativity in basic art education, and puts forward a practical framework to provide reference for future teaching and curriculum design. Following PRISMA 2020 guidelines, researchers searched the Web of Science and Scopus databases and initially obtained 2049 records. After de duplication and screening, eight quasi-experimental studies were retained. All the subjects were primary school students. Each study implemented a teaching method aimed at enhancing the creativity of art classroom, and used standardized tools to evaluate the effectiveness of these methods. Using the methods of narrative review and theme analysis, the author summarizes three main teaching paths. First, some researches have adopted Project-Based Learning (PBL) in STEAM teaching environment. These courses combine art and science to cultivate students' creative thinking and practical ability. Secondly, some researches focus on classroom interaction and innovative teaching strategies. These methods significantly improve the students' creative expression ability and the quality of artistic works. Third, through interdisciplinary and multi-sensory curriculum design, integrate the contents of various disciplines and sensory experience, provide students with rich visual and sensory experience, and promote the development of students' aesthetic consciousness and creative expression ability. In general, these teaching methods have improved students' creativity to varying degrees, especially in fluency, originality and attention to detail. Some studies also found that students have a more positive learning attitude, deeper emotional participation, and increased classroom participation. The existing evidence shows that art education urgently needs a clear and reasonably structured teaching path, which integrates thinking, emotion and culture to better support the all-round development of students' creativity.

Keywords: Elementary art education, Creativity development, Systematic literature review, Quasi-Experimental study, Practical pathways

1.Introduction

Creativity ability is the core ability of modern education. It is considered to be an important foundation for students to realize self-worth and solve complex problems in a rapidly changing society (Brown, Ince and Ramlachhan, 2024). Art education is widely regarded as an ideal way to cultivate creative thinking because of its expressive, exploratory and emotional characteristics (Isakov, 2025). The value of basic art education lies not only in learning painting skills or visual abilities, but also in stimulating children's inherent innovation potential through observation, experience and imagination (Lukaka, 2023). However, in the actual teaching, the art class is often ignored or simplified as a single technical training. The teaching method of cultivating innovative ability in the system is still insufficient. This limits students' cognitive development and affects their ability to form genuine original expressions (licul & juriševič, 2020; Swanzy impraim et al., 2022; Jam et al., 2025).

In recent years, the development of interdisciplinary education has brought new opportunities. STEAM Education (Science, technology, engineering, art and Mathematics) provides a feasible way to improve this situation. Adding "a" (Art) to the original STEM emphasizes the important role of art in promoting innovation, bridging disciplinary links and breaking disciplinary boundaries (Kim, 2018). Under the STEAM framework, "art" includes not only visual arts and performing arts, but also social, cultural, humanistic and linguistic content. It helps students develop comprehensive thinking through the combination of multicultural and interdisciplinary methods. Activities and creations in the artistic context can help students make abstract scientific and engineering concepts more intuitive and understandable, and connect cognition, emotion and social experience in their creations (Yakman, 2007; Malele & Ramaboka Letsoalo, 2020).

Research shows that the combination of art and technology can help students use convergent

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thinking to analyze complex problems in reality, and use divergent thinking to propose and implement solutions (Brady, 2014; Ejiwale, 2013). In STEAM teaching, project-based learning (PBL) is a core method. Through interdisciplinary, student-centered long-term projects, guide students to learn around real problems, and effectively stimulate learning interest and creativity (Hawari et al., 2020; Chang & Chen, 2018). Lu, and Syu (2022) found that the "paper cutting art" STEAM course designed by the "creative problem solving" (CPS) method can significantly improve the creativity of primary school students. This shows that the combination of STEAM and PBL provides a clear and feasible teaching mode for the cultivation of creativity in art education.

Cheng et al. (2007) pointed out that the structured learning process of PBL mainly depends on Teachers' scaffolding support, students' cooperation and real tasks. Students gradually develop self-reflection ability and innovation consciousness in the process of constantly revising and displaying their works. Chang and Chen (2018) also found that incorporating inquiry tasks into art related PBL activities can not only improve students' learning motivation, but also enhance their learning autonomy and promote the transfer of creative thinking to other situations. At the same time, innovative teaching methods, especially the improvement of interactive teaching methods, are crucial to the cultivation of innovative ability. Topping (1998) believes that peer feedback mechanism can enable students to evaluate and learn from each other in cooperation. Through continuous feedback, they will develop critical thinking and diversified perspectives, so as to produce more innovative artistic ideas. The research of Lee et al. (2021) further shows that when digital tools such as mobile devices are introduced into the art classroom, students form a circular structure of "learning feedback redesign" through multiple rounds of assessment and recreation, so as to systematically enhance creativity and classroom participation. Emotion is also an important factor in the creative process. Helping students identify, understand and use emotions to guide their thinking can effectively improve their ability to identify problems and generate ideas (Ivcevic & Hoffmann, 2017; Parke, Seo & Sherf, 2015). In this process, art education is not only an outlet for emotional expression, but also an important way to cultivate emotional regulation ability and creativity. Hoffman, Ivcevic and Malikkal (2021) combined visual art activities with emotional intelligence teaching and found that when students can recognize and use different emotions to guide their creativity, their work quality and problem sensitivity will be significantly improved.

The introduction of contemporary art has also brought new perspectives and methods to primary school art education. Kozjek Varl and Herzog (2021) pointed out that contemporary art has the characteristics of openness, diversity and social criticism, which helps students get rid of simple imitation and establish the connection between personal expression and cultural thinking. By integrating physical experience and multiple perspectives into teaching, students show a higher level of originality and flexibility in creating contemporary art works. This shows that contemporary art is not only an aesthetic content, but also an important teaching tool to promote students' thinking process and enhance creative judgment.

At the same time, the "art fusion" teaching mode connects art with mathematics and other disciplines, expanding the space for creative development. Brezovnik (2015) believes that visual arts can become an important channel for learning mathematics. Through the principles of symmetry, proportion and perspective, students can understand abstract mathematical concepts in a more intuitive way. This learning method is conducive to interdisciplinary understanding and knowledge transfer (Silverstein & Layne, 2010). This integration mode shows that art education is not an isolated course, but should become the core of interdisciplinary integration. The combination of art and mathematics reshapes the learning process: students are no longer just passive listeners, but actively construct knowledge through art and visual expression, realizing the transformation from "understanding knowledge" to "creating knowledge".

On the other hand, the research also shows that the classroom environment and social emotional atmosphere are the key external factors affecting the creativity of Art Education (Licul & Juriševič, 2020). A positive, inclusive and supportive learning environment can enhance students' psychological security. This environment encourages students to

express themselves boldly, dare to try and make mistakes, so as to better play their creative potential. Kogej Varl & Herzog (2021) believes that teachers' creative guidance, classroom structure and peer interaction are the core elements of a classroom atmosphere conducive to creativity. This atmosphere not only helps to cultivate students with special talents, but also stimulates the creative expression of all students.

Overall, the cultivation of creativity in art education has shifted from single skill training to more diverse, comprehensive, and systematic exploration. The existing empirical research, with the help of interdisciplinary teaching (such as STEAM-PBL), innovative classroom interaction (such as peer feedback and emotional guidance), and content integration (such as combining contemporary art and mathematics), provides multiple experiences and inspirations for this field. But these achievements are still relatively scattered and lack systematic integration and comparison.

Therefore, this study adopts a systematic literature review method to organize and analyze quasi experimental research on creativity cultivation in primary school art education. Research focus: In empirical studies of primary school art classrooms, which teaching practices have been proven to effectively enhance students' creativity. According to the PRISMA 2020 guidelines, a systematic search was conducted in the Web of Science and Scopus databases, resulting in the inclusion of 8 eligible studies. The core objective of this study is to identify key teaching practices that have been empirically supported in primary school art education and analyze their possible mechanisms of action. The research results hope to provide evidence-based references for art curriculum design, teacher professional development, and basic education reform.

2. Methods

The purpose of this study is to systematically identify, evaluate and synthesize the existing empirical research on the cultivation of creativity in basic art education, so as to reveal the effective teaching practice. In order to ensure preciseness, transparency and integrity, this study strictly complies with PRISMA 2020 guidelines. The overall research framework and screening process are based on the standard PRISMA flow chart (see Figure 1).

2.1 Eligibility criteria

To ensure that the included studies were highly relevant to the research question, the research team predefined specific inclusion and exclusion criteria aligned with the objectives of the literature review. This study also applied an exclusion principle, whereby studies were excluded if their purpose had only an indirect relationship to artistic creativity or if the intervention was not significantly related to art education.

Table 1.1 Inclusion and exclusion criteria for this study

Category	Inclusion Criteria	Exclusion Criteria
Study Type	Must be a peer-reviewed empirical study with a quasi-experimental design.	Non-empirical studies (e.g., commentaries, theoretical discussions, opinion pieces, or literature reviews).
Participants	Participants must be primary school students (approximately 6 to 12 years old).	Participants are not in primary school (excluding preschool, middle school, or university).
Intervention	Must involve specific teaching practices, curriculum models, or instructional interventions designed to foster or influence student creativity within an arts education context.	The study context is not arts education or does not involve the integration of arts with other subjects.
Outcome Measures	Must include direct measurement or assessment of creativity.	No direct assessment of creativity or lacks relevant outcome indicators.
Language and Publication Date	Limited to English-language literature published between June 2015 and June 2025.	Non-English literature or articles published outside the period of June 2015 to June 2025.
Article Type	Only empirical research articles will be accepted.	Excludes conference abstracts, book chapters, and non-peer-reviewed "gray literature."

2.2 Information sources and search strategy

The systematic search was conducted between January and June 2025, utilizing two major international academic databases, the Web of Science (WOS) Core Collection and Scopus. The search strategy combined subject terms and free-text terms, covering four core dimensions, "primary/elementary school", "visual art", "creativity/creative thinking", and "class/curriculum practice". An example of the search query used for the Web of Science database: is "primary school " OR "elementary school" AND "visual art" AND "creativity" OR "creative thinking" AND "class" OR "curriculum" NOT "kindergarten" OR "secondary" OR "high school" OR "pre-school" OR "preschool" OR "university" OR "higher education" OR "vocational education" OR "teenager*" OR "adolescent*" OR "disab*" OR "disord*" OR "disadvant*" OR "special education". For the Scopus database, the search syntax was adjusted, with modificationsto logical operators and field tags to improve retrieval accuracy. To avoid overlooking potential studies, backward citation tracking reference listsand forward citation searches on subsequent works by relevant authors were also conducted. After multiple rounds of screening, no additional empirical studies meeting the inclusion criteria were found.

2.3 Selection process

The literature screening process was conducted independently by two researchers to ensure objectivity and consistency. This process involved the following four steps:

First, duplicate removal and initial processing. All records retrieved from the two databases were imported into EndNote 20. The software's function was used to automatically remove duplicate records, followed by a manual check to eliminate any remaining duplicates. An automated screening tool was then used to exclude studies with clearly irrelevant titles. Second, title and abstract screening. The two researchers independently read the titles and abstracts of the remaining articles. They performed an initial screening based on the inclusion and exclusion criteria, removing studies that did not meet the requirements. Third, full-text eligibility assessment. Full-text versions of the articles that passed the initial screening were obtained. These were reviewed again to assess whether the research content, subjects, methods, and results included a direct measurement of creativity. Fourth, a mechanism for resolving disagreements. If the two researchers disagreed on the inclusion of a study at any stage, they first discussed it to reach a consensus. If an agreement could not be reached, a third researcher was invited to review and arbitrate the decision.

The final screening results are shown in the PRISMA flow diagram (Figure 1). From an initial 2049 records, 8 quasi-experimental studies that met the inclusion criteria were ultimately selected for the synthesis and analysis phase after duplicate removal, automated screening, manual review, and content assessment.

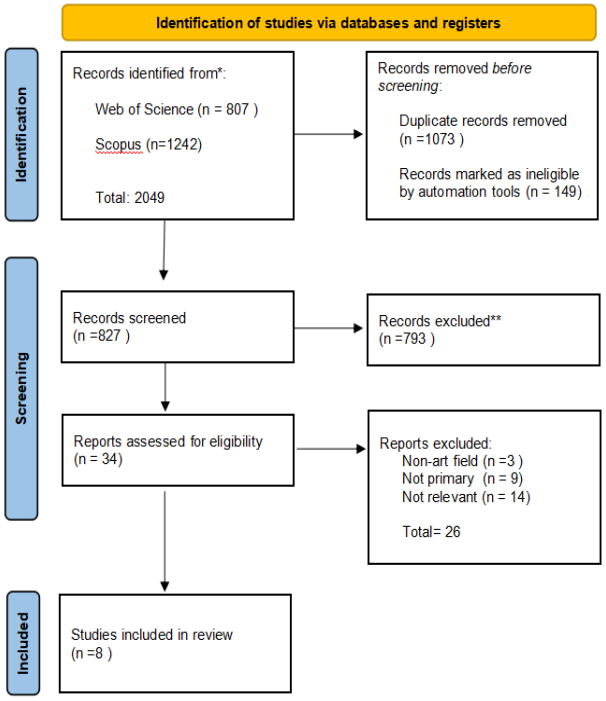

Figure 1. Screening flowchart

2.4 Data extraction

In order to ensure the systematicness and accuracy of data extraction, the research group designed a standardized data extraction template. The first researcher performed the initial extraction, and the second researcher reviewed all entries to ensure consistency.

The extracted data items include basic information (author's name, year of publication, research area), research design (experiment type, class hours, grouping settings), research samples (sample size, students' grade and age range), intervention characteristics (practice mode, course hours, implementation field), creativity evaluation indicators (measurement tools and evaluation dimensions), and main results (specific impact of intervention on students' creativity, including quantitative statistics or qualitative thematic conclusions). In addition, in order to enhance comparability, the research team re coded all the research results and divided them into three categories according to the teaching framework: "STEAM-PBL", "innovative classroom interaction" and "curriculum integration and emotional support". This classification provides the basis for the subsequent thematic synthesis.

2.5 Synthesis of results

Due to the significant heterogeneity in the design, intervention strategies and measurement tools of the included studies, no statistical meta-analysis was conducted in this study. Instead, it adopts the method of narrative synthesis.

Specifically, follow the steps of thematic analysis. First, the inductive method is used to open code the teaching interventions extracted from each study. Then these initial codes are divided into sub topics according to similarity and conceptual connection. 1) Interdisciplinary project learning under the framework of STEAM-PBL; 2) Interactive creative feedback and emotional teaching; 3) A curriculum system that combines interdisciplinary content with art. Finally, through continuous comparison, find out the common points and different mechanisms of these ways. In the whole process of integration, the research team paid special attention to the teaching logic, change mechanism and learning results of each practice path, so as to ensure that the conclusion is not only theoretical explanatory, but also can be used as a reference model for teaching practice.

2.6 Quality assurance

In order to ensure the quality of the study and the credibility of the conclusions, this study implemented a dual verification mechanism from data screening to analysis. All included studies were peer-reviewed empirical papers. Researchers record each step according to the transparency standard recommended by PRISMA 2020, and archive all decision records. The review results shall be cross checked before final determination to minimize subjective bias.

3. Results

This chapter aims to objectively present the results of a systematic literature review, summarize the characteristics of the eight studies included in the final analysis, and synthesize the findings to identify core practical pathways for fostering creativity in primary school art education.

3.1 Characteristics of included studies

This systematic review ultimately included eight quasi-experimental studies that met the inclusion criteria (Table 1). These studies were published between 2015 and 2022 and geographically spanned multiple countries and regions in Asia (Taiwan, South Korea) and Europe (Croatia, Slovenia, Serbia, and Spain). This distribution indicates a global trend and sustained research interest in creativity cultivation within elementary school art education.

In terms of research design, all included studies adopted a pre-test and post test experimental design. Some studies also combine qualitative observations or mixed methods to improve effectiveness. For example, Lu et al. (2022) used a single group pre-test and posttest design to analyze the impact of STEAM curriculum on creativity in upper grade primary school students through a combination of quantitative testing and classroom observation. They conducted CAP creativity tests before and after the course, supplemented by classroom observations and student homework analysis, in order to combine quantitative and qualitative data. Lee et al. (2021) used two comparative quasi experimental designs and implemented a three week "Mobile based Progressive Peer Feedback Scaffolding Strategy". This strategy guides students to engage in self-regulation and peer criticism during the painting creation process through a three-stage feedback mechanism of "micro macro advanced", demonstrating a more

dynamic experimental structure. Kim's (2018) study is a long-term interdisciplinary art education experiment (100 hours in total) that emphasizes the integration of art, science, and humanities curriculum concepts. It uses TTCT graphic test a to measure changes in students' divergent thinking abilities. Other studies structured intervention experiments were conducted, most of which included a parallel control group, and the effectiveness of teaching interventions was evaluated through a combination of quantitative testing, observation, and interviews (Licul & Juriševič, 2020; Kogej Varl & Herzog, 2021 ; Brezovnik, 2015 ; Hoffmann et al., 2021; Selaković, 2017) .

The participants ranged from first grade to sixth grade elementary school students, with sample sizes ranging from 21 to 210 (Lu et al., 2022; Brezovnik, 2015). Most studies controlled for gender and class balance, and some studies also used stratified and quota sampling to ensure sample representativeness (e.g. Licul & Juriševič, 2020) . The cultural and educational backgrounds of the research subjects vary greatly. For example, Hoffmann et al. (2021) conducted an experiment at an art center in Santander, Spain, while Selaković (2017) focused on students in public schools in the Užice district of Serbia. This cross-cultural sample source is highly valuable in determining the universal mechanisms of creativity development in art education.

In terms of teaching intervention, these studies show considerable diversity and innovation. Lu et al. (2022) developed a STEAM based Project-Based Learning (PBL) course called "micro: drill paper-cut lantern", involving Creative Problem Solving (CPS). This course is jointly developed by interdisciplinary teachers and emphasizes setting goals, guiding questions and teamwork in the whole process. Lee et al. (2021) used the mobile application "Hello color pencil" to create a progressive peer feedback system, allowing students to comment on peer works from the perspective of technology, emotion and concept. Jin (2018) designed a 100-hour interdisciplinary art project that combines art with science, environment, language and humanities. This deeply immersive interdisciplinary intervention requires students to visit galleries and artist studios many times and build a portfolio that reflects their learning process.

Licul & Juriševič (2020) investigated 142 Slovenian ordinary art students and gifted students' perceptions of the creative classroom atmosphere, emphasizing the impact of classroom culture and social factors on the development of creativity. Kogej varl & Herzog (2021) explored the changes of 12-year-old students' artistic expression through their "contemporary art intervention course" with the theme of "I am inventing an unusual musical instrument". The results show that the introduction of contemporary art forms, such as video and installations, significantly improves flexibility.

Brezovnik (2015)'s experiment introduced the visual art system into the mathematics classroom, and linked equality with artistic balance, inequality and imbalance through symbolic visual metaphor, demonstrating the interdisciplinary value of artistic cognitive participation. Hoffmann et al. (2021) combines six "emotion and art" units to guide students to understand and apply emotion through artistic creation. The results show that during the two-month follow-up, students' understanding of emotions and the level of thinking are high. Selaković (2017) focused on "actively observing works of art", and examined the visual art creativity (Level 1 and level 2 tests) between the experimental group and the control group, showing a unique teaching approach to activate creativity through perception and artistic expression.

The most widely used standardized tools for assessing creativity include the Torrence Creative Thinking Test (TTCT) (Kim, 2018; Lee et al., 2021), the Creativity Assessment Package (CAP) (Lu et al., 2022), the Karavaris and Kraguljak artistic creativity test (Kogej varl & Herzog, 2021; Selakovi ć, 2017) and the creative classroom atmosphere questionnaire (2015) by Pete szaca et al. (Licul & Juriševič, 2020). Hoffmann et al. (2021) used the Alternative Use Task (AUT) and the creative achievement questionnaire of Batey (2007) to capture children's daily creative behavior.

This multi-level evaluation system combines quantitative scales with qualitative tools, so that the research can comprehensively evaluate the intervention effect from the perspective of cognition, emotion and product, and establish strong cross research comparability and method consistency.

3.2 Quality and consistency assessment

In order to evaluate the scientific preciseness and consistency of the included studies, this study conducted a systematic evaluation according to the PRISMA 2020 reporting guidelines and quality standards in the field of educational research. The evaluation is conducted in five dimensions: research design, sample representativeness, "intervention fidelity", measurement reliability and result transparency. The three-level scale (high/medium/low quality) was used and independently verified by two researchers.

(1) Rigor of research design

The quasi-experimental method was used in all eight studies. Seven of them including the experimental group and the control group, providing a clear structure (Lu et al., 2022; Lee et al., 2021; Kim, 2018; Kogej Varl & Herzog, 2021; Brezovnik, 2015; Hoffmann et al., 2021; Selaković, 2017). Although Lu et al. (2022) used only a set of pretest and posttest designs, they made up for the lack of control variables by combining art work analysis and classroom observation. Kim (2018)'s Cross semester research has a long duration (100 hours) and is highly longitudinal comparable. Hoffmann et al. (2021) included three measurements (pretest, posttest and two-month follow-up) to enhance internal consistency and verify long-term effects. Most studies report on teacher training, classroom tools and experimental environments, indicating that process control is adequate. However, some studies was slightly inadequate in the description of intervention details and randomization procedures (Brezovnik, 2015; Selaković, 2017) .

(2) Sample representativeness and group equivalence

The study samples are generally distributed in multiple layers. Brezovnik (2015) has the largest sample (210 students), which adopts random course selection to improve the statistical ability. Lee et al. (2021) the experimental group and the control group were completely matched (20 participants in each group). The teachers and teaching process were consistent, showing strict method control. The sample of Hoffmann et al. (2021) is from an art center project in Spain (n=64), which uses a combination of voluntary registration and lottery, which helps to reduce the bias of self-selection. Licul & Juriševič (2020) used nonrandom quota sampling to sample artistic talents and conventional groups; Despite the gender imbalance (22% male, 78% female), t-test confirmed that the two groups' perception of classroom atmosphere was comparable. In general, all studies have proved the good practice of sample recruitment, group allocation and pre-test equivalence check, ensuring high external validity.

(3) Clarity and fidelity of intervention methods

All studies provided a structured description and implementation details of educational interventions. In Lu et al. (2022), an interdisciplinary team of teachers jointly implemented the STEAM course, and the effectiveness of the teaching plan was verified by experts. Lee et al. (2021) designed a multi round feedback and progressive evaluation system, and defined weekly tasks and feedback procedures. Kim (2018) reported on an interdisciplinary project jointly directed by teachers and University researchers, including off campus exhibitions and portfolio development. Hoffmann et al. (2021) trained the hosts for 21 hours before the course, using standardized teaching manuals and emotional theme tasks throughout to ensure consistency. In addition, most studies, such as Kogej varl & Herzog (2021), use classroom observation, teacher diaries or videos to monitor the intervention, and some even mirror the content between the experimental class and the control class. These practices have effectively proved the consistency and systematicness of instructional design and its implementation.

(4) Reliability and validity of creativity measurement tools

All studies utilized internationally validated assessment tools. Lu et al. (2022) used the Creativity Assessment Packet (CAP; revised edition by Lin & Wang, 1994). Lee et al. (2021) employed the Creative Drawing Scale, which combines the Torrance Tests of Creative Thinking (TTCT) with expert ratings. Kim (2018) used the TTCT Figural and Verbal Tests, Form A, and reported SPSS analysis results. Licul & Juriševič (2020) used the Pitter-Szarka Creative Classroom Climate Questionnaire. Kogej Varl & Herzog (2021)

and Selaković (2017) both used the Karlavaris & Kraguljac Art Creativity Test. Brezovnik's (2015) study used a dual-test approach, assessing cross-domain cognitive impact through mathematics achievement and an art task. Hoffmann et al. (2021) used a composite assessment including the Alternative Uses Test (AUT), a problem-finding task, and a creative behavior questionnaire. The internal consistency reliability of the measurement tools in most studies was above 0.80, indicating a high overall level of reliability and demonstrating that the measurement results were stable and dependable.

(5) Results reporting and statistical transparency

All studies provided specific statistical results, including mean difference, significance level and effect size. Some studies, such as Licul & Juriševič (2020), supplement the conclusion of statistical significance by using Cohen's D to calculate the effect size. Hoffmann et al. (2021) used a unique follow-up design. The results showed that two months after the end of the course, creative behavior continued to improve. In the research of Lu et al. (2022) and Lee et al. (2021), three senior teachers independently rated students' works and reported the inter rater reliability (ICC). Kim (2018) and Brezovnik (2015) provided detailed data tables and analysis of variance using SPSS, proving the high transparency of the data. The only thing that needs to be improved is that some studies do not fully discuss the potential confounding variables (e.g., teaching time, teacher style).

Overall quality assessment

Based on the combined scores across the five dimensions, the eight studies were categorized as follows:

High-quality studies (4 studies): Lu *et al*. (2022); Kim (2018); Lee *et al*. (2021); Hoffmann *et al*. (2021). These studies were superior in terms of design integrity, data transparency, and theoretical consistency.

Medium-quality studies (3 studies): Brezovnik (2015); Licul & Juriševič (2020); Kogej Varl & Herzog (2021). These studies had high ecological validity but were limited by sample size or a lack of long-term validation.

Foundational-quality study (1 study): Selaković (2017). This study had a simple design but made exploratory contributions to classroom practice innovation and the development of visual art perception.

Overall, theconcluded studies demonstrate a high degree of consistency and strong reliability in their design logic, assessment tools, and reporting standards, providing a solid empirical basis for subsequent thematic synthesis.

Table 1.2 Characteristics of included studies

No.	Paper Title	Author/ Year	Study Location	Study Design/ Method	Study Scale/ Duration	Measurement Scale	Results
1	Project-based learning oriented STEAM: the case of micro–bit paper-cutting lamp	Lu *et al*., 2021.	Taiwan, China	Creativity-Oriented PBL STEAM Course / Single-Group Pre-test-Post-test Quasi-experimental Design (GAP)	21 upper grade elementary school students / two weeks (420 minutes total)	Revised Creativity Assessment Packet (CAP) (Lin & Wang, 1994)	After the intervention, the experimental group showed significant improvements in the fluency, originality, elaboration, and overall scores of creativity. Qualitative analysis indicated that students exhibited positive behaviors in higher-order thinking, problem-solving, and collaborative

							learning during the course.
2	Effects of a mobile-based progressive peer-feedback scaffolding strategy on students' creative thinking performance, metacognitive awareness, and learning attitude	Lee *et al.*, 2021	Taiwan, China	A mobile-based progressive peer feedback scaffolding learning strategy /Quasi-experiment (experimental group, control group)	40 third grade elementary school students / Duration: three weeks (240 minutes total)	1. Creative drawing scale based on TTCT dimensions; 2.Metacognition scale by Lai & Hwang (2014); 3.Learning motivation scale by Schraw & Dennison (1994).	The experimental group's post-test scores in creative performance, metacognitive awareness, and learning attitude were significantly higher than those of the control group. The study indicates that the progressive peer feedback strategy effectively promotes creative performance and self-regulated learning.
3	An analysis of creative effect on interdisciplinary practices in art education	Kim, H. (2018)	South Korea	Interdisciplinary program (integrated teaching across curricula) / Quasi-experimental one group pretest-posttest (paired samples t-test)	41 sixth grade elementary students / One semester (100 hours total)	Torrance Tests of Creative Thinking (TTCT) - Figural Form A	Interdisciplinary arts education significantly improved effectiveness and student performance across all dimensions of creativity (fluency, flexibility, originality, and elaboration), with the greatest improvement in originality.
4	The perception of creative classroom climate in elementary school students: Comparison between regular and enriched visual art classes	(Licul & Juriševič, 2020)	Croatia	An enrichment program for artistically gifted students/ quasi-experimental design (experimental group, control group, independent samples t-test, and paired samples t-test)	142 students from grades 5 to 8 over four school years	School Climate for Creativity Questionnaire (Pitter-Szarka *et al.*, 2015)	Students in the art enrichment program perceived their classroom's creative atmosphere (e.g., encouragement of independence, teacher-student interaction) significantly more positively than students in the regular curriculum.
5	The Impact of Contemporary Art on the Creativity Of Twelve-Year-Olds	Kozjek Varl, K., & Herzog, J. (2021).	Croatia	A quantitative, quasi-experimental study on the impact of contemporary art on the artistic creativity of 12 year old children.	65 sixth grade students from two primary schools (30 in the experimental group, 35 in the control group).	Test for Artistic Creativity or Developmental Standards (Karlavaris & Kraguljac, 1974, *et al.*).	The results showed that teaching methods based on contemporary art effectively promoted six thematic dimensions of students' artistic creativity, with significant improvements in problem sensitivity, elaboration, and originality.

6	The Benefits of Fine Art Integration into Mathematics in Primary School	Anja Brezovnik（2015）	Slovenia	Integrating art into the math curriculum/ Quasi-experiment (Independent samples t-test)	210 students from 10 randomly selected fifth-grade classes	1. Art creativity tasks; 2. Four math tests	The results indicated that the integrated teaching of art and mathematics positively impacted students' acquisition of mathematical knowledge and their ability to solve non-routine problems, demonstrating the transfer benefits of interdisciplinary learning.
7	Emotions, creativity, and the arts: Evaluating a course for children	Hoffmann, J. D., Ivcevic, Z., & Maliakkal, N. (2021)	Spain/Germany	A visual arts-based program teaching creative and emotional intelligence skills /Quasi-experimental (MANOVA and paired-samples t-test)	64 primary school students / two groups	Assessment of Children's Emotional Skills (ACES) (Schultz, Izard, & Bear, 2004); 2. Alternate Uses Task (AUT); 3. Creative Behavior Questionnaire	Compared to the control group, children who received the program showed significant improvements in problem finding, divergent thinking, and emotional understanding, demonstrating the effectiveness of integrating emotional and creative training.
8	Developing and fostering creativity through the works of art by young pupils	Selaković, K. (2017)	Serbia	Applied specially designed strategies and programs to study the effects of active observation of artworks / Quasi-experimental (Independent Samples T-test and ANCOVA)	199 third grade students from two primary schools.	1. Creativity Test (LV1); 2. Four Paintings Test (LV2).	The experimental group (engaged in active art observation) scored significantly higher in general visual arts creativity than the control group. The study demonstrates that guiding students to actively observe artworks is an effective strategy for cultivating their creativity.

3.3 Results and Discussion

This study synthesizes eight quasi-experimental studies on how primary school art education fosters creativity. Through thematic analysis, three main practical approaches were identified: (1) interdisciplinary STEAM-PBL (Project-Based Learning) oriented toward problem-solving; (2) creative classrooms centered on interactive feedback and emotional support; and (3) integrated arts learning based on artistic integration and cultural experiences. These three approaches correspond to the cognitive, affective, and cultural dimensions of creativity development, respectively. The following section presents these findings and discusses their underlying mechanisms and educational implications.

(1) Interdisciplinary STEAM-PBL Learning: A Problem-Oriented Approach to Cognitive Integration and Innovation

Lu et al. (2022) and Kim (2018) showed that the interdisciplinary STEAM-PBL course significantly improved the core indicators of pupils' creative thinking, especially fluency, flexibility and originality.

In the "micro: bit paper cutting lamp" course designed by Lu et al., students participate in the complete inquiry process of identifying problems, designing solutions, implementing or optimizing through the integration of science, programming and art. The pre and post test results of the Creativity Assessment Packet (CAP) show that students' cognitive dimension scores are significantly improved, showing strong problem-solving and innovation ability. Similarly, Kim's research found that after a comprehensive course combining art with science and humanities, students showed significant progress in the Torrance Tests of Creative Thinking (TTCT) ($p<0.001$), and made significant progress in divergent thinking and collaborative skills.

These findings indicate that STEAM-PBL reorganizes cognitive structure through project-based learning and problem-based learning. By building projects or solving problems across disciplinary boundaries, students combine experience, experiment and artistic expression to create a "learning by doing" learning model. This not only verifies the effectiveness of the Creative Problem Solving (CPS) model, but also reflects the learning mechanism of "practice before cognition" in Vygotsky's constructivist theory (Vygotsky, 1978). Inquiry based tasks in these courses not only increase cognitive complexity, but also increase students' participation and self-efficacy. However, this method is relatively weak in emotion and reflection. Future courses can integrate reflective evaluation and emotional experience into project teaching to promote the sustainable development of creativity.

(2) Interactive feedback and emotional support: social construction of creativity growth

Lee et al. (2021), Hoffmann et al. (2021) and Licul & Jurišević (2020) have shown that the development of creativity depends not only on cognitive stimulation, but also on social interaction and emotional support. Lee et al. Designed a "mobile progressive peer feedback" course, which guides students from individual creation to peer evaluation and reflection through a three-stage feedback cycle. After three weeks' experiment, the students' painting structure and expression are better than those of the control group, and their learning attitude and metacognitive awareness are also significantly improved. In interviews, students generally reported that multidimensional feedback from peers fostered broader thinking and self-correction, showing the positive impact of social collaboration on creative learning.

Similarly, Hoffmann's "Visual Arts and Emotional Intelligence Course" combines emotional recognition with artistic creation. 05) The results of the 3-week experiment showed that students' creative behavior and emotional understanding improved significantly after the test ($P<0.05$). The study found that the enhancement of emotional perception and expression obtained through artistic experience constituted an important psychological condition to promote creative thinking. Licul and jurišević's research has increased the perspective of classroom atmosphere: when gifted students perceive greater openness and psychological safety, their creative performance is significantly improved, indicating that environmental support is the key to the formation of intrinsic motivation.

In general, creativity has obvious social emotional attributes, and the generation of creativity depends on the internal mechanism of interactive feedback and emotional resonance. Theoretically, this is consistent with Vygotsky's socio-cultural theory and Amabile's social psychological model, which believes that emotional safety and positive feedback provide psychological protection for individuals to explore new ideas (Alexander, 2020; Wenger, 1998). The interaction in art classroom is not only a cognitive communication, but also a social process of Co Construction of meaning. Therefore, basic art education should strengthen social support and emotional trust in the organization and evaluation methods, so that students can form a stable creative self through expression and co creation.

(3) Artistic integration and cultural experience: perceptual activation and meaning generation

Kozjek Varl & Herzog (2021), Brezovnik (2015) and Selaković (2017) and other scholars' studies emphasize that cultural experience in art education can promote students' innovative development in perception, cognition and values. In the experiment conducted by kozjek Varl and Herzog, students' scores in refinement and flexibility were significantly

improved after introducing contemporary art forms such as installations, videos and performances. This shows that open artistic expression encourages students to liberate from a single way of thinking and form personalized views. Brezovnik's research integrates art into mathematics courses, teaching functions and equations through visual concepts such as balance and rhythm. The results show that the experimental group is better than the control group in mathematics performance and innovative problem-solving ability, which shows the role of art as a bridge in interdisciplinary learning. Selaković's research further points out that the systematic teaching of actively observing works of art can significantly improve students' visual sensitivity and imagination, and confirm that perceptual experience is a creative cognitive trigger.

These studies theoretically reflect Eliot Eisner's theory of artistic cognition and Arthur efran's view of cultural learning. They believe that art is a way of thinking that constructs meaning through multi-sensory experience (Eisner, 2002; Efland, 2002). In the process of observing, understanding and reproducing art works, students not only improve their expression ability, but also learn to interpret the world from a cultural perspective. This shows that the cultural experience in art education has dual generativeness, which helps students form value judgments in the social context while cultivating individual imagination. Therefore, basic art education should serve as a bridge connecting cognition and culture, and promote students' critical thinking and cultural understanding through aesthetic exploration.

(4) Theoretical Integration and Educational Implications

By integrating the three pathways, a three-dimensional interactive model for fostering creativity in elementary school art education can be constructed.

Table 1.3. A Three-Dimensional interactive model for fostering creativity in elementary school art education

Dimension	Pedagogical Focus	Internal Mechanism	Creativity Manifestation
Cognitive	Interdisciplinary STEAM-PBL Learning	Problem-Driven Inquiry and Knowledge Restructuring	Fluency, Logic, and Cognitive Flexibility
Affective	Peer Feedback and Emotionally Supportive Classrooms	Interactive Reflection and Affective Empathy	Originality, Affective Depth, and Self-Expression
Cultural	Arts Integration and Cultural Experiences	Perceptual Activation and Meaning-Making	Openness, Critical Thinking, and Cultural Creativity

The model believes that the cultivation of creativity in primary school art education is a systematic process involving cognitive inspiration, emotional experience and cultural reflection. STEAM-PBL course strengthens cognitive inquiry, interactive feedback mechanism stimulates emotional motivation, and comprehensive art teaching expands cultural understanding. These three elements work together to form a dynamic balance among cognition, emotion and culture. From the perspective of practical teaching, this requires educators to not only pay attention to problem design and knowledge connection, but also create a safe and interactive environment to guide students to reflect on society and culture through art practice. Therefore, art education goes beyond simple skill acquisition and becomes an important way to cultivate comprehensive innovation ability and humanistic quality.

To sum up, the comprehensive results of the eight studies show that the development of creativity in primary school art education is not driven by a single teaching strategy, but the result of the interaction of various forces. Art learning promotes knowledge updating through interdisciplinary integration, arouses desire for expression through social interaction, and deepens meaning generation through cultural experience. This three-dimensional mechanism provides theoretical guidance for the reform of primary school art curriculum in the future. It encourages teachers to expand teaching from technical training to situational creative experience, and transform the classroom into a comprehensive learning community connecting knowledge, emotion, intention and action.

4. Conclusion

Through a systematic review of eight empirical studies, this paper identifies three main ways for primary school art education to cultivate creativity: interdisciplinary STEAM-PBL learning, interactive and emotional support classroom, and art comprehensive cultural experience teaching. These approaches correspond to the cognitive, emotional and cultural dimensions of learning, and together form a systematic mechanism for cultivating creativity. The results show that interdisciplinary project-based learning can effectively improve students' cognitive flexibility and problem-solving ability. Emotional participation and interactive classroom improve students' willingness and intrinsic motivation to express themselves. In addition, the comprehensive art course broadens students' cultural understanding and aesthetic imagination. In short, art education in primary schools should be regarded as an organic unity of cognitive reconstruction, emotional participation and value construction.

Based on these conclusions, the practice of cultivating creativity in primary school art education should be more comprehensive in the future. Curriculum design should strengthen interdisciplinary and project integration, integrate art, science, technology and humanities seamlessly, and promote the transfer and application of creative thinking through problem solving in real situations. The implementation of teaching should pay attention to emotional interaction and create a safe, open and encouraging classroom atmosphere. Establish a dynamic evaluation system based on peer feedback and teacher-student dialogue, pay attention to students' emotional experience in the process of innovation, and stimulate students' internal motivation and innovation confidence. Educational content and resources should be combined with contemporary art, community culture and daily aesthetics, highlighting culture and multiple perspectives. Through observation, experience and critical thinking, guide students to link art learning with cultural understanding and value construction. In addition, future research should adopt mixed methods, combining quantitative assessment with qualitative observation, to reveal the dynamic evolution of creativity in cognitive, emotional and cultural dimensions. Cross cultural comparative research also needs to verify the universal applicability and cultural adaptability of different teaching models.

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