

# Influence of visual art participation on creative thinking for art and design private college student in Guangzhou, China

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**Abstract:** This study focuses on the impact of visual arts participation on the creative thinking of students in private art and design institutions in Guangzhou. Visual arts are not only an important part of art education but also play a crucial role in cultivating students' critical thinking, creative problem-solving skills, and divergent thinking. To explore this impact, the study collected data on students' participation in visual arts courses through questionnaires, supplemented by interviews, and analyzed changes in their creative thinking. The results show that students demonstrated significant improvements in critical thinking, creative divergence, and problem-solving abilities after participating in visual arts activities. Specifically, through the free exploration and innovation fostered in art creation, students exhibited higher cognitive flexibility and an enhanced ability to solve complex problems. Thus, visual arts not only promote artistic expression but also provide opportunities for breaking free from conventional thinking, positively contributing to the development of interdisciplinary innovation skills. The findings offer new insights into creative thinking cultivation in art education and have practical implications for educational practice.

**Keywords:** Visual arts participation, creative thinking, critical thinking, STEAM education

## 1. Introduction

In the context of accelerating globalization and the rise of innovation-driven economies, the importance of creative thinking in education is becoming increasingly prominent, particularly in the fields of art and design. Creative thinking is seen as a key driver of innovation, problem-solving, and career development. For students pursuing art and design majors, creative thinking is not only an academic requirement but also the foundation for entering the creative industry and achieving long-term career success (Samaniego et al., 2024).

Visual arts encompass a wide range of fields, including painting, sculpture, architecture, photography, fashion, and digital arts, all of which can stimulate creativity through exploration, critical thinking, and innovative perspectives. Studies show that STEAM education and interdisciplinary approaches play a significant role in fostering creative thinking (Samaniego et al., 2024). Furthermore, visual arts pedagogy not only stimulates students' creative abilities but also promotes curriculum reform and interdisciplinary education. Although much research has been conducted in Western education systems, studies in non-Western regions remain relatively scarce. By integrating resources from different disciplines, students' critical thinking and innovative perspectives can be enhanced, providing new insights for global educational reforms (Lukaka, 2023).

As a core component of art education systems, visual arts have long been considered a crucial path for promoting the development of creative thinking. It not only provides students with a platform for expressing emotions and ideas but also creates a broad stage for nurturing innovative thinking. Through the process of artistic creation, students can fully demonstrate and express their personal ideas, while also sharpening their critical thinking and problem-solving abilities, thereby effectively enhancing their cognitive flexibility and creative potential. As research has pointed out, visual arts education fosters rigorous thinking habits and promotes the continuous development of cognitive and social skills (Winner et al., 2020).

Throughout the visual art creation process, students often face various innovative challenges, which require them to break free from conventional thinking and explore novel and unique solutions. As visual art creation relies on the transformation between abstract thinking and concrete expression, there is a close relationship between artistic creation and innovative outcomes (Ulger, 2018). Innovations in color, composition, and form during the creation process not only

enhance students' artistic skills but more importantly, they significantly foster their divergent thinking and creative abilities.

Guangzhou, a city with a rich cultural heritage, offers abundant artistic practice opportunities through its private art and design institutions. These institutions skillfully integrate the cultivation of creative thinking with professional skill training, thereby establishing a unique teaching model that comprehensively promotes students' progress in artistic skills, critical thinking, cross-cultural understanding, and innovation. Therefore, conducting in-depth research into the role of visual arts in these institutions, especially its impact on students' creative thinking, is of great significance for advancing the reform and long-term development of art education in Guangzhou.

This paper will systematically review relevant research and delve into the specific impact of visual arts on students' creative thinking in private art and design institutions in Guangzhou. Specifically, this paper will address the following questions:

1. How does participation in visual arts enhance students' creative thinking?
2. How do critical thinking and creative thinking complement each other in art education to improve students' academic and innovative abilities?
3. How do emotional factors influence students' creative thinking in visual art creation?

This paper aims to deeply explore the role of visual arts in art education and provide solid theoretical support and practical guidance for future innovations and reforms in art education.

## 2. Literature review

### 2.1 Definition of Creative Thinking

In recent years, there has been an increasing recognition that creative thinking should be cultivated as an important outcome in school education. Creative thinking is generally defined as the ability to view and solve problems from unique perspectives, avoiding traditional solutions and encouraging out-of-the-box thinking. In this process, individuals can discover new connections, embrace challenges, and propose unusual, original, and innovative methods. However, despite the widespread recognition of the importance of creative thinking, there is still no consensus on its definition. As a result, there is still a lack of a universally accepted framework for teaching and assessing creative thinking (Ramalingam et al., 2020).

Creative thinking can be described as a set of cognitive activities used by individuals to address specific objects, problems, and situations, or as the effort made by individuals to tackle specific events and problems according to their abilities (Birgili, 2015). Creative thinking is a mental process that allows students to use their imagination to generate and evaluate their ideas, questions, and hypotheses (Kampylis & Berki, 2014). The indicators of creative thinking in research include fluency, flexibility, originality, and elaboration (Syaibani et al., 2017). Fig.1 presented the conceptual framework of this research.

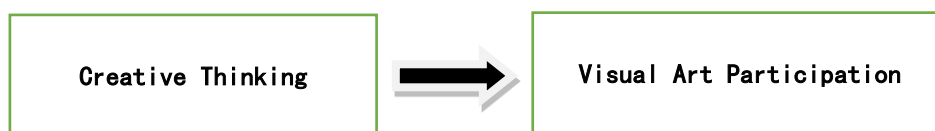


Fig. 1 Conceptual framework

## 2.2 Research on Creative Thinking

### 2.2.1 The Relationship Between Creative Thinking and Critical Thinking

The relationship between creative thinking and critical thinking has been a major focus of academic research. Critical thinking primarily focuses on evaluating and analyzing the value of things, while creative thinking focuses on the generation of new concepts and innovative problem-solving methods. For example, in Indonesia's education system, a STEM-based project-based learning model has been shown to significantly improve high school students' critical and creative thinking abilities, particularly among higher-scoring students (Sumarni & Kadarwati, 2020).

Design sprints, as highly concentrated collaborative design activities, are effective in promoting the development of both creative and critical thinking by solving real-world problems in a short period of time, thus providing strong support for students' professional and academic careers (Tang et al., 2020). This process not only stimulates students' innovative thinking but also cultivates their ability to critically analyze complex issues (Alsaleh, 2020). Moreover, the cultivation of creative thinking is not only aimed at generating novel ideas but also includes divergent thinking, associative thinking, and critical thinking (Pan, 2022). Emotional factors in learning are also important, and research has

shown that art forms (such as video art) can effectively stimulate students' creative thinking and enhance their deep understanding of learning content (Santiago & Perez, 2020).

With the ongoing development of education, neuroscience, and innovation fields, many important studies have explored the relationship between creativity and critical thinking. Research has shown that creative thinking involves multiple brain areas, and the emotional motivation system closely collaborates with higher cognitive functions during creative tasks. The generation of creative thinking depends not only on an individual's cognitive abilities but also on emotional and motivational factors (Khalil et al., 2019).

Furthermore, the 21<sup>st</sup>-century skills framework emphasizes that the education system must equally focus on the cultivation of both critical and creative thinking, particularly in fostering students' innovative capabilities. Critical thinking helps students analyze problems rationally, while creative thinking promotes the generation of innovative solutions. Research indicates that critical thinking and creative thinking complement each other, and both work together to enhance problem-solving abilities (Thornhill-Miller et al., 2023; Ülger, 2016).

From an educational practice perspective, the integration of critical and creative thinking is crucial for the comprehensive development of students. Recent neuroscience studies have revealed the complex neural networks behind creative and critical thinking. By understanding the biological foundations of these cognitive processes, we can better design educational interventions to enhance students' thinking abilities. Moreover, critical and creative thinking are not only fundamental to the innovation process but also play a significant predictive role in the generation of innovative outcomes (Shubina & Kulakli, 2019). Creative thinking and cognitive processes, such as problem-solving and inspiration triggering, are crucial in innovation (Shubina & Kulakli, 2019). Therefore, higher education needs to systematically design curricula to cultivate students' creative and critical thinking (Lukaka, 2023).

In conclusion, creative thinking and critical thinking are not only closely linked at the cognitive level but also play a vital role in education and innovation practices. These studies provide theoretical support for educational reform and offer valuable insights for future research directions (Khalil et al., 2019; Shubina & Kulakli, 2019; Thornhill-Miller et al., 2023; Ülger, 2016).

### **2.2.2 The Relationship Between Creative Thinking and Emotions**

There is a close relationship between creative thinking and emotions, and this phenomenon has been extensively explored in recent academic research. Mindfulness, as a psychological state, promotes the development of creative thinking by alleviating anxiety, enhancing emotional regulation, and cultivating an open-minded thinking pattern. Mindfulness training helps individuals overcome the fear of external judgment, promoting emotional balance and increasing self-awareness, which plays a critical role in enhancing creativity (Henriksen et al., 2020). Moreover, emotions play a crucial role in the thinking process. Research has found that positive emotions, such as happiness and curiosity, significantly enhance an individual's cognitive flexibility, risk-taking spirit, and problem-solving ability, thereby fostering creativity.

In contrast, negative emotions, such as anxiety and sadness, may inhibit the development of creative thinking. Therefore, educators should create environments conducive to innovation and creativity by effectively managing and guiding students' emotions (Irving-Walton et al., 2024). On this basis, different emotional states have significantly different effects on creativity. Positive emotions, such as happiness and satisfaction, promote creative thinking, while negative emotions, such as sadness and fatigue, may suppress creativity. Further studies have shown that moderate adjustments to environmental factors, such as providing access to natural landscapes, can effectively improve emotional states and create favorable psychological conditions for creative thinking (Ko et al., 2020).

Further research indicates that emotional regulation and emotional states play a crucial role in shaping creative thinking. Emotional regulation ability, particularly the ability to reappraise emotions, has a positive effect on creativity, while rumination weakens this ability (Lam & Saunders, 2024). A meta-analysis further confirms the positive impact of emotion reappraisal on creativity when solving complex problems, while emotion suppression inhibits creativity (Kuška et al., 2020).

The impact of emotional intelligence, resilience, and gratitude on creativity has been studied by Li et al., who found that emotional intelligence promotes creativity by enhancing resilience, while gratitude plays a moderating role in this process. Additionally, research has shown the role of emotions in creative evaluation, revealing that positive emotions promote the acceptance of creativity, while negative emotions lead to stricter evaluations. Both studies emphasize the significant role of emotions in creativity, while also pointing out the complexity of emotional influence on creativity. Future research should explore the bidirectional effects of emotions and cultural differences.

### **2.2.3 The Relationship Between Creative Thinking and Academic Achievement**

In the 21<sup>st</sup>-century education system, creative thinking has become one of the core skills, especially in the field of visual arts, where fostering creativity is particularly important. Recent studies have shown that different educational approaches and technological tools have a significant impact on students' creative thinking and artistic achievement. For example, by using the Schoology teaching platform, students' creative thinking skills and artistic achievements were significantly improved. In particular, compared to traditional teaching methods, students in the experimental group demonstrated stronger creativity and artistic expression (Baharudin et al., 2022). This finding highlights the important role of the

educational environment and technological platforms in art education. Additionally, a study in China explored visual arts courses based on micro-videos. The results showed that students' use of smartphones and video editing software to create micro-videos effectively enhanced their creative thinking, imagination, and innovation ability. This not only increased students' autonomy but also fostered their sense of social belonging (Osterman, 2023). Experiential learning, through hands-on art creation activities, significantly improved students' creative problem-solving skills and artistic expression, emphasizing the close relationship between creative thinking and students' artistic development (Esola, 2022).

Moreover, creative thinking not only has a profound impact on art education but also plays a significant role in promoting academic achievement. For example, creative thinking enhances students' academic performance in solving complex problems and innovative tasks (Henriksen et al., 2020). Academic challenge pressure has a positive impact on graduate students' creative thinking, with academic self-efficacy and resilience playing important mediating roles (Tzachrista et al., 2023). At the same time, the educational environment and teaching methods are considered key factors in promoting creative thinking. Specifically, interactive, student-centered teaching methods can significantly improve students' creativity (Irving-Walton et al., 2024). Further research has explored the moderating role of students' motivation in the relationship between creative thinking and academic achievement, suggesting that intrinsic motivation positively impacts students' creativity (Yao et al., 2023). While these studies provide valuable insights, further investigation is needed to explore how different cultural backgrounds and individual differences specifically influence the development of creative thinking, in order to provide more targeted strategies for educational practices.

### 2.3 Definition of Visual Art Participation

As a concept in educational and psychological research, visual art participation originated from exploring the role of art education in students' growth and psychological development. It has become a topic extensively studied by many scholars who have provided rich theoretical foundations from different perspectives. Pierre Bourdieu, through his theory of cultural capital, emphasized the close relationship between social class, educational background, and art consumption, proposing that visual art participation is not only an aesthetic activity but also a symbol of social status and a tool for the reproduction of social structures.

Similarly, Howard S. Becker in his book *Art Worlds* suggested that art creation is not an individual activity but a product of social collaboration, with artists, audiences, patrons, and other roles collectively constructing the art world. Mihaly Csikszentmihalyi's "Flow Theory" revealed the deep psychological experiences involved in the art creation and participation process, suggesting that visual art participation can allow individuals to enter a highly immersive state, thereby enhancing creativity and happiness. John Dewey, from the perspective of experiential philosophy, argued that art is an experiential process, where the interaction between the audience and the artwork provides profound cognitive and emotional experiences, making art not merely a static material form but a dynamic aesthetic experience.

Through art participation, students can enhance creativity, develop critical thinking, and express emotions. Nicolas Bourriaud, through his concept of "Relational Aesthetics," expanded the definition of visual art participation by emphasizing the interactive role of the audience in contemporary art, asserting that the meaning of the artwork lies in the relationship constructed between the audience and the artwork. Furthermore, Ellen Dissanayake, from an anthropological perspective, explored the evolutionary function of art, pointing out that art, as part of human culture and emotional expression, is not limited to aesthetics but also has social interaction and cultural communication functions.

### 2.4 Various Types of Visual Art Participation

#### 2.4.1 Educational Participation

Research in the field of education has shown that participation in visual arts has profound impacts on students' development in several areas. Visual art activities not only help alleviate anxiety and depression, enhance self-esteem, and foster social connections, but also contribute to the rehabilitation of psychological health (Tomlinson et al., 2023). Moreover, demographic factors such as race, age, and education level significantly affect art participation. The results of art education show that through art courses, students' levels of participation are significantly improved. Through visual art, students learn to creatively and critically solve complex problems, which has a far-reaching impact on their overall development (Sheridan et al., 2022).

At the same time, participatory art activities not only serve as carriers of aesthetic experiences but also have the potential to challenge social organizations, particularly in redefining and discussing social issues (Sztabiński, 2018). The impact of visual art participation extends beyond creation and expression; it is also closely linked to academic achievement and students' overall sense of engagement. Research shows that visual art courses significantly enhance students' innovation, critical thinking, and self-expression (Arov et al., 2019), and play a key role in improving classroom participation and academic performance (Schneider & Rohmann, 2021).

In addition, research on visual art participation across different cultural backgrounds reveals varying influences of art education. In the United States, the availability of high school art courses is closely related to the size of the school, with larger schools, especially public schools, being more likely to offer art courses, while schools in poorer areas face a lack of art resources (Winner et al., 2020). Research in the Netherlands suggests that art can serve as a "bond" and

“bridge” for social cohesion, particularly in challenging artistic forms, helping to promote more inclusive and open social attitudes (Otte, 2019). In African regions, artistic methods are widely used in the public health field, especially in AIDS prevention and health education, through forms such as drama, music, and visual art to promote behavior change related to health (Bunn et al., 2020). Meanwhile, the impact of performing arts on individual mental health, social interaction, and cultural identity has been confirmed, as it promotes emotional expression and social connections through music, dance, and other forms.

The combination of technology and art has also become an important trend in recent years. For instance, the application of media art and augmented reality technology in museum experiences enhances audience participation and immersion through innovative exhibition methods (Papadas et al., 2023). LLaVA (Large Language and Vision Assistant), which uses visual and language models to automatically analyze artworks and generate complex language descriptions, has greatly improved the efficiency of art criticism and curating (Liu et al., 2024). These studies demonstrate the tremendous potential of combining technology with art and provide new perspectives on art consumption and creation.

### **2.4.2 Art Consumption Participation**

Art consumption is not only an aesthetic experience but also a diverse emotional journey. Studies show that museum visitors experience a wide range of emotional responses, such as curiosity, awe, and joy, especially those who visit for the first time or have a strong interest in art. Their emotional experiences are richer, not only triggering emotional resonance but also enhancing their multidimensional understanding of art (Ryan Bengtsson & Edlom, 2023). The museum experience extends beyond appreciating individual artworks, becoming part of a broader emotional journey. Visitors generate emotions such as curiosity, surprise, and joy when attending exhibitions or purchasing artworks, which enhances psychological satisfaction (Fekete et al., 2023).

Moreover, performing arts provide audiences with unique emotional and cultural experiences. Live performances allow audiences not only to consume content but also to foster emotional interaction and resonance. Although digital platforms have expanded the channels for consuming performing arts and increased accessibility, online performances cannot fully replace the immersion and interactivity of live experiences. Performing arts not only promote the cultural industry but also provide emotional and social experiences that enhance physical and mental health and improve life satisfaction (Guhn et al., 2020; Sheppard & Broughton, 2020).

During the COVID-19 pandemic, art consumption became an important tool for coping with stress and anxiety. Research has found that age, education level, social support, and emotional coping strategies are key predictors of art participation. Younger people and those with higher levels of social support are more likely to engage in emotional regulation through digital art, music, and crafts. These activities not only alleviate stress but also promote personal development (Mak et al., 2021).

### **2.4.3 Participation in Art Creation**

In the 20<sup>th</sup> century, art creation underwent a process of "de-skilling," especially with the rise of conceptual art. Avant-garde artists such as Marcel Duchamp introduced ready-made objects, breaking traditional standards of artistic technique and redefining the boundaries of art creation. "Deskilling" emphasizes that the value of art comes from the creator's ideas and concepts, rather than relying on traditional craftsmanship, reflecting a shift in artistic labor from material production to conceptual production. In this process, the "labor" of art creation involves the production of symbols and the re-creation of social meanings.

The various projections in the art creation process are closely related to the artist's imagination and perception. The creative process is more like the gradual clarification of a vague or "unfinished" state, rather than arriving at a clear solution through filtering. This dynamic and constantly revised creative path shows how artists gradually find direction in uncertainty and ambiguity, ultimately forming a complete artwork. Visual art participation is not limited to traditional viewing and creation, but also includes broader cultural and local art practices, which are significant for studying the relationship between art and health (Sonke et al., 2024). The forms of art participation are diverse, including active volunteer involvement, public displays of art creation, and in-depth exploration of social interaction (Gross & Pitts, 2016).

In the creation of performing arts, the content often includes multimedia narratives, self-reflection, exploration of social issues, and collaboration. Through media such as film, video, and sound, creators can convey complex emotions and ideas, reflecting issues such as identity, race, and gender. Performing arts creation emphasizes collaboration, breaking the isolated creation model and enhancing social connections and interactions (Rice et al., 2020). Performing arts creation involves interactivity, emotional expression, technical challenges, and cultural background. Creators must adapt to the real-time feedback from the audience, conveying emotions through body and sound, while stage design and lighting add complexity to the creative process. Cultural background has a profound influence, especially in modern creation, where creators must balance multiculturalism and the expression of social issues. Overall, performing arts creation integrates interactions and challenges from various aspects (Bayles & Orland, 2023; Talaboev et al., 2020).

### 3. Discussion

In recent years, participation in visual arts has been regarded as a key factor in advancing students' creative thinking and academic abilities. The "Studio Thinking" model theory suggests that visual arts education helps students develop rigorous thinking habits, which in turn enhances cognitive levels and social skills. It emphasizes the central role of reflective practice in art education and argues that artistic creation fosters critical thinking and creative problem-solving abilities (Winner et al., 2020).

Educational methods play a crucial role in visual arts instruction. Approaches such as problem-based learning, project-based learning, and interactive teaching can help students develop higher-order and divergent thinking skills. The development of design thinking during the foundational stages of art education is of significant importance. The integration of technology, such as virtual reality and artificial intelligence, through interactive and immersive methods, stimulates students' creative thinking and enthusiasm for participation. STEAM education, which integrates interdisciplinary approaches, and project-based learning in art programming courses further promote the development of students' creative thinking. Field visits to art museums also provide valuable opportunities for cultivation.

The impact of visual arts education is influenced by learning styles. Art students engage in reflective practices, making them more adaptable to complex creative tasks, while design students tend to favor pragmatic learning styles. In social and cultural contexts, visual arts provide students with opportunities to express opinions and reflect on societal issues, helping them grow into citizens with critical thinking and a sense of social responsibility. Additionally, the role of visual arts in promoting students' mental health and creativity has been a topic of increasing interest.

Research shows that participation in visual arts significantly improves students' self-efficacy, mental health, and creative thinking. Further research has explored the impact of art education on college students' mental health, pointing out that creativity and self-efficacy play a moderating role in improving students' mental health status. A systematic review summarizes the effectiveness of interdisciplinary projects, artistic practices, and digital tools in promoting creative thinking, with a particular focus on the core role of STEAM education in fostering creativity (Samaniego et al., 2024). However, existing research has limitations in terms of sample diversity and research methods. Future studies should involve longitudinal research and a broader sample coverage to verify the long-term effects and universality of educational methods.

### 4. Conclusion

In the context of globalization and the rise of innovation-driven economies, the role of creative thinking in education, especially in the fields of art and design, has become increasingly significant. Art education is recognized as a key pathway to fostering creative thinking, as visual arts play a crucial role in enhancing cognitive flexibility and innovation abilities. By promoting critical thinking, innovative perspectives, and problem-solving skills, visual arts such as painting, sculpture, and photography help students transcend traditional thinking boundaries, thus cultivating creativity and the capacity to solve complex problems. Research indicates that integrating interdisciplinary practices, such as STEAM education, with art education further strengthens students' creative thinking and mental well-being. Notably, private art institutions in Guangzhou have emphasized this integration, fostering cross-cultural understanding and innovation through a combination of art creation and interdisciplinary approaches.

However, despite the promising potential of visual arts education in global educational reforms, research on its impact in non-Western regions, particularly in China, remains limited. Existing studies suggest that art education positively influences students' self-efficacy, mental health, and creative thinking, yet the diversity of sample populations and the methodological approaches in current research could be improved. Future studies should employ longitudinal designs and broader sample coverage to verify the long-term effects and generalizability of these educational methods. Ultimately, visual arts education not only cultivates creative thinking but also plays an essential role in enhancing mental health, critical thinking, and interdisciplinary innovation. As such, further research focusing on its impact within different cultural contexts is vital for advancing global educational reforms and fostering innovation in education worldwide.

#### 4.1 Innovations and Limitations of the Study

The study highlights several innovative approaches in visual arts education. By incorporating methodologies like problem-based learning (PBL), project-based learning, and interactive teaching, the research emphasizes the development of higher-order and divergent thinking. Notably, PBL fosters creativity by helping students tackle uncertain and open-ended challenges. The integration of emerging technologies, such as virtual reality and artificial intelligence, introduces immersive and interactive dimensions to art education, effectively enhancing students' creative thinking and engagement. Furthermore, STEAM education and interdisciplinary projects, including art programming courses, provide a holistic framework for cultivating creativity. Field visits to art museums offer students real-world opportunities to interact with artwork, promoting open and critical thinking.

Despite these advancements, the study acknowledges several limitations. Existing research is constrained by limited sample diversity, as most studies focus on specific student groups, such as art or design majors. Additionally, the methodologies often lack longitudinal data, making it difficult to evaluate the sustained impact of these educational approaches. The findings predominantly rely on short-term interventions, leaving room for uncertainty about their long-

term effects and generalizability across diverse educational contexts. Moreover, the influence of cultural and institutional factors on the effectiveness of these methods remains underexplored, signaling the need for broader and more inclusive research designs.

## 4.2 Future Outlook

Future studies should aim to address the identified limitations by adopting longitudinal research designs to assess the enduring effects of visual arts education. Expanding sample diversity is critical, incorporating students from varied disciplines and cultural backgrounds to ensure findings are universally applicable. Additionally, exploring the integration of newer technologies, such as augmented reality and generative AI, could further enrich the scope of visual arts education, fostering more immersive and adaptive learning environments.

Collaborative efforts between educators, technologists, and policymakers are necessary to develop curricula that emphasize creativity, critical thinking, and social responsibility. STEAM education should continue to serve as a foundational framework, with further research on interdisciplinary approaches that combine art, technology, and humanities. Moreover, studies should investigate the role of visual arts in addressing contemporary societal challenges, such as mental health and social inequality, to reinforce its relevance in a broader social context.

Lastly, more attention should be given to understanding the cultural and institutional dynamics influencing the adoption of innovative practices in art education. By bridging the gaps between theoretical models and practical applications, future research can ensure that visual arts education remains a dynamic and inclusive field that nurtures creative and socially conscious individuals.

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