



DESIGN, IMPLEMENTATION, AND EVALUATION OF AN INNOVATIVE ART EDUCATION PROGRAM BY PRE-SERVICE KINDERGARTEN TEACHERS, WITH AN EMPHASIS ON THE ARTFUL THINKING TECHNIQUE

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Abstract:

Arts play a vital role in the development of children in preschool education. Artistic expression within the kindergarten setting offers children opportunities to explore the world around them, enhance their imagination, strengthen their self-confidence and creativity, express their ideas through various media, enrich their emotional world, and cultivate their cultural awareness. Today, engagement with the creation of art serves as an effective means of creative representation and communication of ideas and emotions for preschool children. Findings from numerous studies highlight the impact and significance of integrating arts into early childhood education, linking them to the development of lifelong learning skills. The international academic community recognizes the importance of building children's capacity to respond effectively to situations that require critical thinking, reflection, autonomy, creativity, and decision-making. Incorporating artful thinking (A.T.) and thinking routines (T.R.) into kindergarten classrooms has been shown to support both artistic reasoning and the development of children's critical thinking skills. But how artful thinking, thinking routines, and the arts are connected in early childhood education? Can thinking routines, in the context of art, become effective and meaningful in developing children's critical thinking skills? The purpose of the present study is to implement and evaluate a program for introducing works of art by pre-service kindergarten teachers (P.K.T.) to preschool children through the technique of artful thinking. Specifically, this research aims to investigate whether an innovative education program based on global artworks—conducted during the teaching practice of pre-service kindergarten teachers—can enhance preschool children's thinking skills through artful thinking routines. The study sample consists of 40 third-year pre-service kindergarten teachers from the Department of Preschool Education at the University of Crete, who are teaching in five public kindergartens

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in the prefecture of Rethymno during the 2024–2025 academic year. Data will be collected and analyzed through the examination of pre-service kindergarten teachers' individual portfolios, classroom observation of their instructional interventions, and an evaluation questionnaire on the art program. The findings indicate a notable enhancement in young children's critical thinking skills as a result of the systematic implementation of thinking routines and the artful thinking approach within art-integrated instructional interventions. These pedagogical practices appear to support both the process of active knowledge discovery and the cultivation of aesthetic literacy, while also strengthening children's reflective and interpretive abilities. Moreover, the majority of pre-service kindergarten teachers expressed a positive attitude toward the art program based on artful thinking, acknowledging its contribution to children's cognitive development and creative expression.

Keywords: artful thinking, art, critical thinking, kindergarten, pre-service kindergarten teacher

1. Introduction

Art, as a medium of expression, creation, and communication, plays a decisive role in the lives of young children. From the earliest years, children come into contact with colors, materials, and various media, which they use to express their thoughts, emotions, and experiences—often in ways that precede verbal communication. Art constitutes a fundamental means of exploring the world and is closely linked to children's holistic development. Through various forms of artistic expression, children develop skills, cultivate creativity, and shape their identities (Lowenfeld & Brittain, 1964).

According to research, art is a key tool in both aesthetic and emotional development (Isenberg & Jalongo, 2013). Engagement with art helps children develop emotional intelligence, while, as a creative process, it offers a safe space for emotional release and the cultivation of self-esteem and confidence (Eisner, 2002). At the same time, art fosters innovation and critical thinking (Perkins, 1994), giving children the opportunity to experiment, solve problems, and express themselves in unique ways—free from the fear of “right” or “wrong.”

Furthermore, art serves as a common ground for communication among all children, regardless of linguistic, cultural, or cognitive background (Wright, 2012). It provides an open and inclusive space for expression and participation in which children cultivate imagination, observation, critical thinking, and symbolic representation (Efland, 2002; Freire, 1978; Perkins, 1994). Today, the integration of the arts in early childhood education goes beyond artistic expression and is deeply connected with the development of critical thinking and reflective thought. Through structured creative processes and appropriately designed learning environments, children develop skills of observation, analysis, interpretation, and evaluation—skills that lay the foundation for becoming active, autonomous, and reflective individuals (Eisner, 2002; Wright, 2012).

Thus, the investigation of the role of the arts in developing preschool children's critical thinking is highly significant. It supports educators in:

- a) recognizing the child as an active and reflective subject rather than a passive recipient of knowledge,
- b) designing appropriate learning environments that promote dialogue, interpretation, and inquiry, and
- c) validating, both scientifically and pedagogically, the importance of the arts in early childhood education as a meaningful domain of learning—not merely as entertainment.

The aim of this study is to present an innovative program of art, based on works of global art, implemented within the teaching practice of pre-service kindergarten teachers. The objective of the program is to enhance and support the development of critical thinking and reflection in preschool children through the use of the artful thinking approach.

2. Literature Review

2.1 Arts and Critical Thinking in Early Childhood

Arts are a field of expression and creativity, but also function as a significant catalyst for the cognitive and reflective development of preschool children. By integrating artistic activities that encourage critical thinking and reflection, the kindergarten environment can certainly cultivate citizens who think creatively, independently, and with a sense of social responsibility.

Art provides children with the chance to explore, make decisions, analyze, differentiate, and rationalize their choices (Eisner, 2002). Exposure to artistic influences and engagement in the creation of artworks improve children's capacity to think and act autonomously and beyond the obvious, to interpret various viewpoints in their unique manner, and to establish significant links with the real world in which they are growing up (Wright, 2012).

Critical thinking, according to Facione (1990), entails the intentional and reflective evaluation of different information and concepts. Although it is a multifaceted skill, many studies suggest that it can start to be developed in early childhood through various experiences that embrace questioning, exploration, and creativity within a collaborative context (MacNaughton & Williams, 2009). The concept of critical reflection refers to the process through which children think about their own thoughts and actions, reflect on their experiences, and construct new meanings (Schön, 1983).

Within the modern kindergarten context, this kind of reflection is fostered through verbal expression and interaction with peers and educators, dialogue, interpretation, and the connection of personal experiences with a range of creative activities (Ingalls, 2013; Lukaka, 2023). The arts—especially when combined with discussion, storytelling, or dramatic representation—create fertile environments for the development of these capacities.

Moreover, artworks support children in discovering multiple meanings, generating symbolic representations, and reflecting on issues related to social relationships, situations, or emotions (Vecchi, 2010). Art does not provide a one-way to “correct” answers, but instead fosters dialogues and channels of communication. This creates the conditions for reflective learning communities (Rinaldi, 2021). Kindergarten can be one of these contexts, where children, teachers, and the environment create a dynamic network that promotes critical thinking, discussion, and artistic meaning-making.

Interacting with a work of art develops observational skills, symbolic interpretation, reasoning, and self-expression (Isenberg & Jalongo, 2013; Wright, 2012). Through personal and shared exploration, open expression, conversation, and thoughtful practice, the child transforms into an active co-creator of knowledge. The teacher, the reflective setting, and the group serve as multimodal supports for promoting lifelong learning and critical consciousness from early childhood.

Today, the role of the kindergarten teacher is to create environments that promote critical inquiry, to pose open-ended questions, to allow time for thinking, and to embrace diverse answers (MacNaughton & Williams, 2009). Kindergarten teacher acts as a facilitator of thinking rather than an authoritative figure, thereby giving space to the child’s initiative and voice (Edwards, Gandini & Forman, 1998).

2.2 Thinking Routines and Artful Thinking

In the current pedagogical context, the focus has transitioned from merely imparting knowledge to fostering thinking skills in analysis, interpretation, and the creation. Especially in early childhood, a period characterized by intense curiosity and imagination, the development of reflective thinking is deemed essential for lifelong learning. In this framework, thinking routines and artful thinking serve as two interconnected approaches that encourage visible thinking, engagement, collaboration, communication, and creative expression.

Thinking routines are concise and adaptable strategies aimed at assisting children in the exploration of ideas, formulation of questions, and interpretation of situations. They act as a form of “scaffolding” that renders children’s thinking observable, fosters metacognitive awareness, and promotes reflection (Ritchhart, Church & Morrison, 2011; Ritchhart & Perkins, 2008). In the early childhood context, these routines can be enhanced through the incorporation of images, objects, role-playing, and storytelling.

Conversely, the artful thinking framework employs the arts—such as visual arts, music, movement, and drama—to enhance thinking, imagination, interpretation, and creativity (Tishman & Palmer, 2006). By utilizing thinking routines, this method makes children's thinking visible and directs them through a process of critical reflection. Specifically, children are motivated to observe, describe, connect, analyze, interpret, and develop new perspectives.

One of the primary objectives of artful thinking is to foster dispositions for reflection, particularly focusing on the nurturing of thoughtful learners (Bratitsis,

Melliou, Kalamatianou & Fatseas, 2023). The essential dispositions associated with artful thinking encompass:

- a) making comparisons and connections,
- b) recognizing complexity,
- c) exploring alternative perspectives,
- d) reasoning based on evidence,
- e) posing questions and conducting investigations, and
- f) observing and articulating (Tishman & Palmer, 2006).

The foundation of artful thinking philosophy lies in the formulation of well-structured questions that activate thinking, enhance observation, inspire creativity, promote justification, and recognize the absence of definitive right or wrong answers (Tishman & Palmer, 2006).

The research literature underscores the role of thinking strategies and artful thinking in the cognitive, linguistic, social, and emotional growth of young children. Evidence consistently demonstrates that thinking routines assist children in organizing their thoughts and articulating their ideas coherently, while artful thinking enables them to transcend the obvious, intertwining emotion with reason, and fostering imagination and empathy. Furthermore, both thinking routines and artful thinking have been evidenced to enhance language skills, critical reflection, and children's engagement in social discourse (Perkins, 1994; Ritchhart & Perkins, 2008; Tishman & Palmer, 2006).

2.3 Research Aim and Research Questions

The aim of this study is the implementation and evaluation of an art program involving works by various painters, carried out by pre-service kindergarten teachers with preschool children, through the artful thinking approach. More specifically, the present research seeks to explore:

- a) the value and contribution of the arts to the development of preschool children,
- b) the types of methodological approaches and instructional practices employed by the pre-service kindergarten teachers to support children's critical thinking through artful thinking strategies, and
- c) the potential benefits of implementing an art-based program using the artful thinking technique in early childhood education.

To fulfil the objectives of the present study, the following research questions were formulated:

- How are the principles of artful thinking and thinking routines connected to the arts within the context of a kindergarten setting?
- Can an art program, based on global artworks, enhance and improve children's thinking skills in the preschool setting through the artful thinking technique?
- Is it possible to develop children's critical thinking and reasoning abilities through their engagement with works of art by various painters?

3. Methodology

3.1 Method

This study constitutes a qualitative, evaluative multiple-case study of instructional interventions implemented by pre-service kindergarten teachers as part of their teaching practice. The multiple-case study is situated within the framework of a collective case study design, which aims to achieve a holistic understanding of a phenomenon by examining complex systems that are not easily isolated or studied through other methods (Dillman Taylor & Blount, 2021; Merriam, 1998).

3.2 Research Procedure

To explore the research questions of this study, six instructional interventions were designed and carried out by pre-service kindergarten teachers in five public kindergartens located in the prefecture of Rethymno, Crete. Throughout the implementation and observation of these instructional interventions, the academic supervisor–researcher acted as a facilitator, guide, mentor, advisor, and interpreter of the process.

Prior to the implementation of the instructional interventions, two preparatory workshops were held at the university to support pre-service kindergarten teachers in understanding and internalizing the artful thinking methodology for approaching artworks with preschool children.

Subsequently, the pre-service kindergarten teachers implemented the instructional interventions in the kindergartens, under the observation of the academic supervisor. Following the instructional interventions, content analysis of the pre-service kindergarten teachers' portfolios was conducted, providing interpretive insights into their teaching practice. The findings of the instructional interventions were presented during a specially organized follow-up session at the university, held toward the end of the academic semester. This session aimed to facilitate an in-depth discussion of the data generated, evaluate the instructional processes, and highlight the conclusions drawn from the educational experience. Additionally, it served as a context for promoting feedback and collective reflective practice, thus contributing significantly to the strengthening of the learning community.

3.3 Sample

The study was conducted in five public kindergartens in the region of Rethymno, Crete, within the context of the pre-service kindergarten teachers' practice during the 2024–2025 academic year. A total of six instructional interventions were carried out over a period of six weeks. The sample consisted of 40 pre-service kindergarten teachers (4 male and 36 female) from the Department of Preschool Education at the University of Crete. Table 1 presents an overview of the participant sample involved in the study.

Table 1: Demographic data

		n	Percentage (%)
Sex	Male	4	10,0%
	Female	36	90,0%
Age	18-25	28	70,0%
	26-33	9	22,5%
	34-41	2	5,0%
	42-49	1	2,5%
	≥ 50	0	0,0%
Total		40	100,0%

3.4 Data Collection and Analysis

A variety of methods and techniques were employed for data collection. Specifically, the study utilized observation, textual analysis, and questionnaires administered to the pre-service kindergarten teachers upon completion of their instructional interventions.

Observation included all participating pre-service kindergarten teachers and was conducted by the academic supervisor, who recorded the data in a personal research journal. The use of non-participant observation allows the researcher to collect data in a natural setting in order to evaluate or understand behaviors and interactions as they occur spontaneously within a specific environment (Kakana & Botsoglou, 2016).

Textual analysis was based on the portfolios submitted by the pre-service kindergarten teachers at the end of their practice. Each portfolio included:

- a) the written daily plan of the instructional intervention (I.I.),
- b) a written description of the implementation of the instructional intervention,
- c) a written evaluation of the instructional intervention, and
- d) photographic documentation of the activities.

The questionnaire given to the pre-service kindergarten teachers consisted of two parts and ten questions. The first part included a single demographic question. The second part contained eight closed-ended questions using a five-point Likert scale, assessing:

- a) the perceived benefits of the art program for young children through the artful thinking technique,
- b) potential changes in children's thinking and expression,
- c) the degree of enhancement in children's cognitive functions,
- d) the extent of active, exploratory, and inquiry-based participation of children,
- e) the methodological approaches and teaching practices used during the instructional interventions,
- f) the extent to which children used higher-order thinking skills through the use of questioning, and
- g) the type of ICT tools employed.

Additionally, one open-ended question was included, asking participants to reflect on the strengths and weaknesses of the instructional interventions implemented through the artful thinking framework.

Content analysis was used for the interpretation and evaluation of all collected data, as it allows for drawing conclusions from a variety of data types (Krippendorff, 2013). For the analysis of the questionnaire results, frequency and percentage measures were used with the help of Microsoft Excel, which enabled efficient and accurate processing of the research data.

4. Results and Discussion

4.1 Instructional Interventions

The first instructional intervention aimed to introduce children to the painter Vincent van Gogh and his famous works *"The Starry Night"* and *"Vase with Fifteen Sunflowers"*.

The thinking routines implemented during the instructional intervention included:

- Questioning & investigating-centered routines (I see, I think, I wonder).
- Perspective taking-centered routines (perceive, know, care about).
- Observing & describing-centered routines (colors, shapes, lines).

The instructional intervention was interconnected with the thematic areas of mathematics, ICT, visual arts, and natural sciences through corresponding activities (Figure 1).

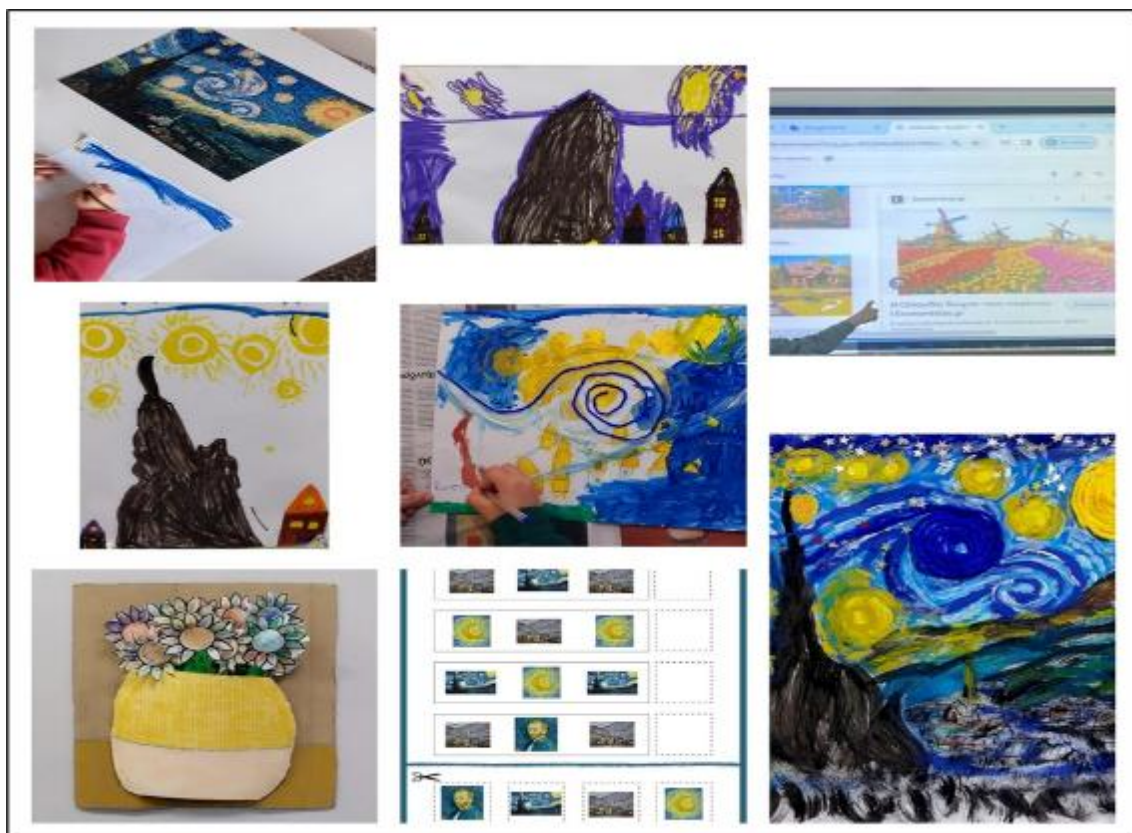


Figure 1: Activities related to Vincent van Gogh

Most of the pre-service kindergarten teachers experienced considerable anxiety during the first instructional intervention, as it was their initial encounter with children in a preschool setting. However, many reported that they used appropriate teaching tools that helped the children understand the topic and sparked their interest.

A typical excerpt from the instructional intervention evaluation of one pre-service kindergarten teacher illustrates this:

"I noticed that children were excited about art, and specifically about painting and this particular artist. It was a theme they were familiar with, as they engaged in painting on a daily basis. The teaching aids I used—such as a mascot, the storybook, reproductions of Vincent van Gogh's artworks, and the laptop—helped me capture their interest in art, resulting in a satisfactory level of participation..." (P.K.T. 2, Instructional Intervention Evaluation, pp. 12–14).

The second instructional intervention aimed to introduce children to the painter Edgar Degas through an exploration of his artworks *"The Millinery Shop"*, *"Ballet Dancers on the Stage"*, and *"Harlequin's Dance"*.

The following thinking routines were implemented during the instructional intervention:

- Questioning & investigating-centered routines (I see, I think, I wonder).
- Observing & describing-centered routines (colors, shapes, lines).



Figure 2: Activities related to Edgar Degas

The instructional intervention was integrated with the thematic areas of music, ICT, visual arts, mathematics, and physical education, through corresponding activities (Figure 2).

The content analysis of the pre-service kindergarten teachers' portfolios revealed that many of them successfully organized a rich learning environment at all levels, stimulating children's interest in personal exploration.

A characteristic excerpt from the academic supervisor's field journal regarding this particular instructional intervention illustrates the point:

"...Today I observed the instructional intervention of P.K.T.24, who conducted an activity centered on the exploration of visual artworks through the artful thinking approach, utilizing three paintings by Edgar Degas: The Millinery Shop, Ballet Dancers on the Stage, and Harlequin's Dance. The pre-service kindergarten teacher effectively organized the classroom environment, fostering a calm and aesthetically pleasing atmosphere. The artworks were progressively presented through large-scale prints and digital projections, and she diligently adhered to the core questions of the artful thinking routine: 'What do you see here?' 'What makes you say that?' 'What more can we find?' Children responded with vivid interest, articulating their thoughts, feelings, and interpretations with remarkable variety and sincerity. I observed that the pre-service kindergarten teacher responded to each child's input with sensitivity and authenticity, nurturing a safe communication space where every opinion was appreciated. In "The Millinery Shop", children focused on the intricate details of the hats and the women's faces, describing the shop as 'a dream-like place,' as one child expressed. In "Ballet Dancers on the Stage", the discussion expanded around movement, music, and how 'the body tells stories without speaking.' "Harlequin's Dance" also generated significant interest, with children recognizing elements of theatre, disguise, and dance, making connections to their own personal experiences. The activity culminated in free visual expression, where children crafted their own figures using pastels and paper cut-outs, inspired by the poses and costumes of the dancers. The transition from observation to expression was seamless and imaginative." (Academic Supervisor's Journal, p. 21)

The third instructional intervention aimed at introducing the children to the painter Henri Matisse and his artworks titled *"The Cat and the Red Fish"*, *"The Parakeet and the Mermaid"*, *"Red Room (The Dessert: Harmony in Red)"*, *"Boy with Butterfly Net"*, and *"The Snail"*.

The thinking routines that were implemented included:

- Questioning & investigating-centered routines (I see, I think, I wonder) (creative questions).
- Observing & describing-centered routines (colors, shapes, lines) (looking: ten times two) (beginning/ middle/ end).
- Comparing and connecting-centered routines (headlines).
- Perspective taking-centered routines (perceive, know, care about).

The instructional intervention was connected to the thematic fields of music, ICT, visual arts, mathematics, drama, and physical education through corresponding activities (Figure 3).



Figure 3: Activities related to Henri Matisse

By the midpoint of the instructional interventions, several pre-service kindergarten teachers realized the importance of allowing children the freedom to express their thoughts and the necessity of respecting them. More specifically, they understood that teaching is not a simple transmission of knowledge, but a dialogue in which the child is an active participant. Respecting each child's differing viewpoint is not merely an ethical imperative — it is a vital pedagogical strategy that enhances learning and autonomy in the modern preschool setting.

Characteristics are the excerpts from the instructional intervention reports of some pre-service kindergarten teachers:

"Today I felt like I was with children in a vibrant world filled with colors, shapes, and imagination. I chose to work with Henri Matisse's artworks, particularly from his collage period characterized by bold colors, because I wanted the children to express themselves freely, without being limited by realistic depictions. The activity was grounded in the fundamental principles of artful thinking: I presented each artwork without giving information about its title, so that the children could respond in a spontaneous manner. I posed the guiding questions: -What do you see here? -What makes you say that? -What else can we find? Their responses were remarkable. For "The Cat and the Red Fish", one child said: 'The cat isn't angry or hungry, it's merely dreaming it's a fish and wishes to

swim.’ For “The Snail”, another child observed: ‘It looks like a flower that spun around and became a painting!’ — which confirmed to me how open and creative children remain in their interpretations. In “Harmony in Red”, many children concentrated on the colors, with one stating: ‘The entire room is red because it’s within a fire.’ It was profoundly moving to see how many different meanings they could give to a nonobjective painting.” (P.K.T. 6, Instructional Intervention Report, p. 11)

“During the follow-up art activity, I gave them colorful papers to create their own collage compositions ‘like Matisse,’ inspired by their own thoughts. I noticed how much freedom they felt to cut, paste, and create images with non-realistic colors and unusual forms. This experience helped me realize that when art is approached as an open-ended stimulus, without pressure for ‘correct answers,’ it is possible to build an authentic dialogue with children.” (P.K.T. 25, Instructional Intervention Report, p. 9)

“...The artful thinking method functioned as a bridge between the artwork and their thinking — it gave them a voice. What I take away from this day: that children don’t need ‘knowledge’ to talk about art. They need space, trust, and respect for their ideas. Matisse’s art gave them all this — and I try to give it to them too.” (P.K.T. 4, Instructional Intervention Report, p. 7)

The fourth instructional intervention aimed to introduce children to the painter René Magritte and his artworks titled “Golconda”, “The Voice of Space”, “The Return”, “The Son of Man”, “Decalcomania”, “The Promise”, and “Man in a Bowler Hat”.

The thinking routines that were implemented included:

- Questioning & investigating-centered routines (I see, I think, I wonder).
- Perspective taking-centered routines (perceive, know, care about).
- Observing & describing-centered routines (colors, shapes, lines) (looking: ten times two).
- Comparing and connecting-centered routines (headlines).

The instructional intervention was connected to the thematic fields of ICT, visual arts, mathematics, natural sciences, and music through corresponding activities (Figure 4).

Upon completion of the four instructional interventions, a common denominator that emerged in most of the instructional interventions designed by pre-service kindergarten teachers was the intention to integrate pedagogical practices that promote experiential learning, a playful approach to education, and the collaborative dynamic of group work. The systematic introduction of children to these educational principles reflects the effort of the pre-service kindergarten teachers to enrich their teaching practices with pedagogical approaches that enhance active participation, social interaction, and authentic engagement in the learning process.



Figure 4: Activities related to René Magritte

Some pre-service kindergarten teachers characteristically write in their daily planning reports:

"...As I was preparing today's activity, I felt both excited and challenged: how can you introduce young children to the surreal world of René Magritte? The idea of using artful thinking based on his works seemed ideal to me, as it allows children to approach art through their own thoughts, associations, and imagination — without predetermined answers. To structure the activity, I tried to organize it around three core principles: experience, play, and collaboration. For experiential learning, my goal was for the children to engage both physically and emotionally. Before even seeing the paintings, we started with a 'fantasy object' game — I asked them to imagine a world where nothing is what it seems: umbrellas fly, apples talk, people have clouds for faces. This activity served as a warm-up to understand Magritte's logic. For playful learning, we played a game called 'Truth or Fantasy?', where the children, looking at details from Magritte's paintings (such as Golconda or The Son of Man), had to guess whether something was 'normal' or 'magical.' They had great fun with the strange images, which helped them more easily enter the symbolic, subversive world of the artist. Within the framework of collaborative learning, I divided the children into small groups, and each group worked on one painting. In their groups, they observed the painting, discussed what they saw, what seemed odd, and tried to 'alter' the image by creating their own version (e.g., changing what the man with the apple has instead of a face). What was most beautiful was that, during the preparation, I felt I wasn't 'teaching art' — I was creating a space for play, surprise, and mental exploration." (P.K.T.38, Instructional Intervention Report, p. 13)

"...Magritte provides wonderful material that children can engage with easily — as long as they are given space for interpretation. If I have time, I plan to follow up with a creative collage activity where each child will compose their own surreal image. I hope to see 'bubbles in the sky,' 'fish holding umbrellas,' or 'shoes that think' — because ultimately, through the absurd, children learn to see the world differently." (P.K.T. 32, Instructional Intervention Report, p. 19)

Another pre-service kindergarten teacher highlights emphatically:

"...For the first time, I realized the power of art when it connects with personal experience. The children weren't just looking at a painting. They were living it." (P.K.T. 11, Instructional Intervention Evaluation, p. 21)

The fifth instructional intervention aimed to introduce children to the painter Frida Kahlo and her artworks titled *"Me and My Parrots"*, *"Self-Portrait as a Tehuana"*, *"Self-Portrait Dedicated to Dr. Eloesser"*, *"The Wounded Deer"*, and *"Frieda and Diego Rivera"*.

The thinking routines that were implemented included:

- Questioning & investigating-centered routines (I see, I think, I wonder).
- Observing & describing-centered routines (beginning/ middle/ end).
- Comparing and connecting-centered routines (headlines) (I used to think, now I think).
- Perspective taking-centered routines (perceive, know, care about).

The instructional intervention was connected to the thematic fields of visual arts, physical education, ICT, mathematics, personal and socio-emotional development, and drama through corresponding activities (Figure 5).



Figure 5: Activities related to Frida Kahlo

As the instructional interventions were approaching their completion, it became evident that a significant number of pre-service kindergarten teachers designed and implemented instructional interventions aimed at strengthening children's core cognitive functions, such as observation, critical thinking, logical reasoning, and problem-solving. The application of appropriate pedagogical strategies and activities — with an emphasis on active participation — revealed the deliberate effort of the pre-service kindergarten teachers to enhance children's cognitive processes within a rich and multimodal learning environment inspired by the world of art.

One pre-service kindergarten teacher characteristically reflects on her experience with this particular self-report:

"...I chose to present to the children works of Frida Kahlo, knowing that her world is complex, full of emotion, symbolism, and pain. At first, I wondered whether young children could 'grasp' such elements. But eventually, I realized that with artful thinking, they don't need to understand everything — it's enough for them to observe, reflect, and feel. During the preparation process, my goal was to create an exploratory experience that would stimulate active thinking, supporting key mental functions such as observation, critical reasoning, reflection, analysis, and synthesis. In the end, the children succeeded! Regarding observation, they were encouraged to describe details, colors, and facial expressions. In terms of critical thinking and reasoning, when a child said, for example, 'I think Frida is sad,' I would ask, 'What makes you say that?' — and their responses often showed impressive depth. As for reflective thinking and emotional inquiry, in the painting "The Wounded Deer", many children were silent at first. But with open-ended questions like 'What might the animal be feeling?' or 'If this were a fairy tale, what story would it tell?', a rich and symbolic dialogue gradually unfolded. Regarding analysis and synthesis, one particularly interesting observation came when children made connections between the animals and Frida Kahlo herself. In "Me and My Parrots", one child said, 'Maybe the animals are her friends when she's lonely.' So, what do I believe I achieved? I think I created a space for open dialogue, without "right" or "wrong" answers. At the same time, I strengthened children's observation skills and expressive language through authentic questioning. The children responded willingly, and most seemed to grasp the power of images as emotional carriers. What would I improve in my teaching intervention? I would incorporate short stories prior to each painting to assist children in gradually recognizing Frida Kahlo's emotional world. Today's experience confirmed something I always believed in theory: children don't need to understand art — they just need to immerse themselves in it. Frida Kahlo served as a catalyst for us to discuss our own experiences, including themes of sadness, resilience, the animals that accompany us, and the stories we carry within. Ultimately, this is profoundly educational." (P.K.T. 16, Self-Evaluation Report, p. 41)

Another pre-service kindergarten teacher notes:

"...I didn't expect such depth in children's thinking. In the art activity, they gave form to their 'personal values.' I feel fulfilled. Their thinking matured through art — and so did I." (P.K.T. 17, Instructional Intervention Evaluation Report, p. 8)

The final instructional intervention aimed to introduce children to the painter Yayoi Kusama and her artworks titled *"Pumpkin"*, *"Dots Obsession"*, *"Infinity Dots"*, *"Mushrooms"*, *"Lemonade"*, *"Watermelon"*, and *"Flowers"*.

The thinking routines that were implemented included:

- Questioning & investigating-centered routines (I see, I think, I wonder),
- Observing & describing-centered routines (beginning/ middle/ end) (colors, shapes, lines),
- Comparing and connecting-centered routines (headlines).

The instructional intervention was connected to the thematic fields of ICT, visual arts, mathematics, and physical education through corresponding activities (Figure 6).

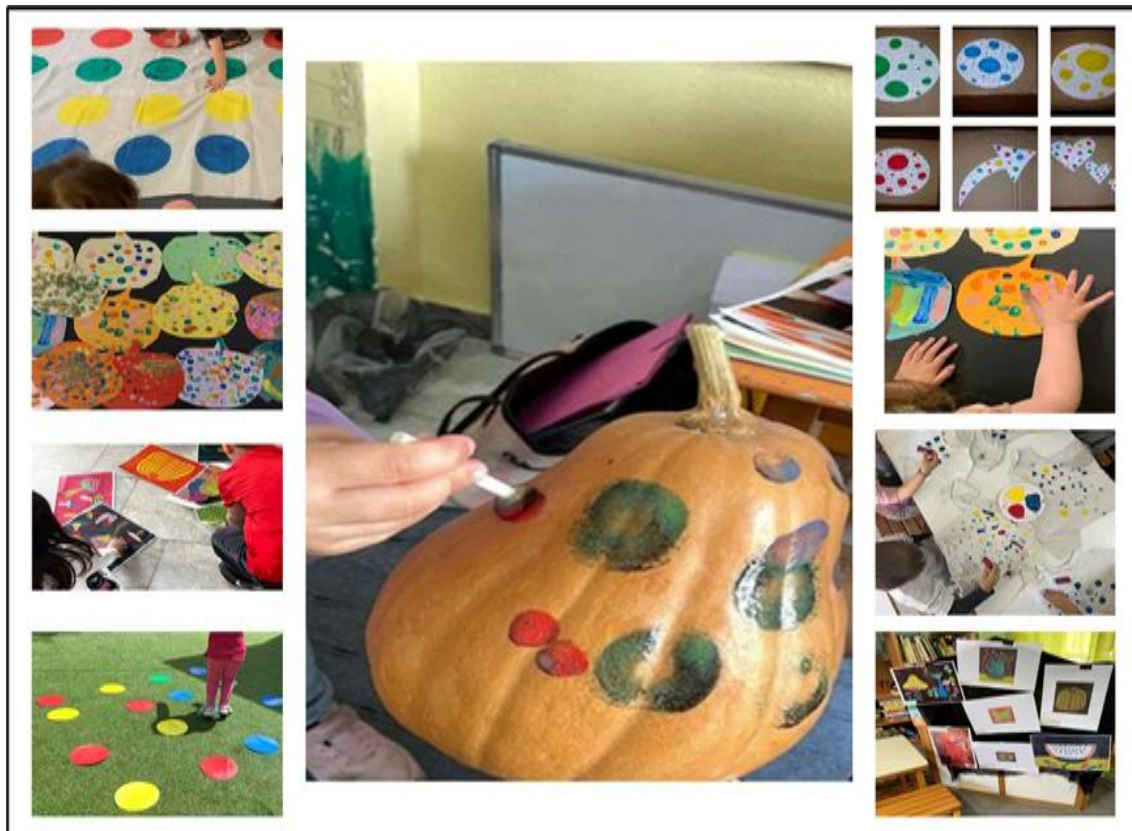


Figure 6: Activities related to Yayoi Kusama

Completing the series of instructional interventions, the reflections of both the pre-service kindergarten teachers and the academic supervisor confirmed the pedagogical value of the artful thinking approach, as well as its positive impact on strengthening children's cognitive, social, and emotional skills through this specific art program.

Characteristic are the reflections that follow from the academic supervisor regarding the final instructional intervention and the overall completion of the art program.

"Today's observation of the P.K.T. 18 was executed in an exemplary manner, showcasing a series of creative interventions designed to introduce young children to the world of contemporary art. Focusing on the works of Yayoi Kusama, the pre-service kindergarten teacher skilfully and imaginatively employed the method of artful thinking, integrating it with specific thinking strategies that facilitated the children's engagement with observation and reflection. The instructional intervention began with the display of numerous iconic works by Kusama, which instantly ignited the children's curiosity. With authentic enthusiasm and pedagogical insight, the pre-service kindergarten teacher posed open-ended questions that fostered dialogue and promoted thoughtful engagement among the children: "What do you see here?" – "What makes you say that?" – "What else can we notice?" The children responded expressively and imaginatively: "It looks like she entered into a dot and got lost," said one child, while another wondered, "Perhaps the colors represent feelings she has never experienced?" These responses illustrate the rich potential that art holds for nurturing critical thinking, empathy, and creative expression – even at such a young age. The art activity that followed (creating individual artworks inspired by Kusama's "dots") supported children's self-expression and experimental nature, allowing them to use colors and materials freely. The pre-service kindergarten teacher encouraged each child to articulate what was "hidden" within their artwork, activating the routine "Think – Expand – Share." The process exhibited duration, depth, and rhythm – all components that demonstrate how art, when paired with reflective strategies, can serve as a powerful tool for learning, expression, and personal empowerment.

...a brief reflection on the overall art program...

Leaving the classroom today, I felt deeply moved and inspired. The art program I observed over this period – and especially today's instructional intervention – affirms that preschool children not only can engage with art, but they genuinely need to do so. Not merely as a "subject," but as a context for free thought, aesthetic growth, and personal expression. The integration of thinking routines and artful thinking strategies has proven to be effective, facilitating children's cognitive, emotional, and aesthetic development in a natural and seamless manner. I sincerely hope to see more pre-service kindergarten teachers embark on this journey – a journey where art intersects with children's thoughts and imagination, fostering respect and inspiration." (Academic Supervisor's Journal, p. 94)

Equally important are the reflections of other pre-service kindergarten teachers regarding this particular instructional intervention and the completion of the art program, as they characteristically note in their self-assessments:

"...Today I carried out the final activity of the art program in the kindergarten, centered around the fascinating art of Yayoi Kusama. After a cycle of instructional interventions exploring various artists, choosing Kusama was both a challenge and an opportunity: her works are abstract, bold, different — just like the children's gaze. I began with the projection of "Infinity Dots", using the "See-Think-Wonder" thinking routine. The children observed shapes and colors, connected the dots to bubbles, microcosms, and even "playdough planets", as one child said. Approaching the artworks through artful thinking helped them deepen their thinking, justify their interpretations, and reflect on nonobjective images. Also, they created "infinite pumpkins" with dots and patterns. They worked in small groups, commented on each other's creations, and shared their thoughts in a discussion circle using the "Beginning – Middle – End" routine, telling the "story" their artwork might express. What excited me the most was how much the children's thinking had evolved over time. From simple descriptions, they moved toward analogies, questions, and interpretations. Art became a space for reflection — not just "drawing." The children became little philosophers, observers, creators." (P.K.T. 23, Instructional Intervention Evaluation, p. 28)

"...I leave the classroom filled with profound joy and fulfilment. Completing this art program through thinking routines and artful thinking, reaffirmed all my beliefs regarding the significance of art in early childhood. Children possess the capability to "interpret" images, to engage in complex thinking, and to reflect — as long as we offer them the space, the tools, and our trust. Yayoi Kusama — with her fascination for infinity, repetition, and emotional expression — served as a reflection for the children. In their artwork, I discovered something surprising: art as a conversation, rather than merely a product." (P.K.T. 12, Instructional Intervention Evaluation Report, p. 37)

"I can't wait to design new instructional interventions in the future. This experience empowered me as a future kindergarten teacher and filled me with energy, creativity, and confidence that art belongs at the heart of early childhood education — not peripherally, but meaningfully and experientially." (P.K.T. 31, Intervention Evaluation Report, p. 24)

4.2 Evaluation Questionnaire for the Instructional Interventions

The first part of the questionnaire referred to the demographic characteristics of the sample. The second part of the questionnaire included a question regarding the benefits of implementing the art program using the technique of artful thinking for young children. Table 2 presents the percentage and frequency concerning the benefits of the art program through artful thinking.

Table 2: Benefits of the Art Program through Artful Thinking

	Not at all	Slightly	Moderately	Very	Extremely
Social-emotional development	0 (0,0%)	16 (40,0%)	18 (45,0%)	5 (12,5%)	1 (2,5%)
Interpersonal relationships	1 (2,5%)	11 (27,5%)	19 (47,5%)	8 (20,0%)	1 (2,5%)
Behaviors	5 (12,5%)	10 (25,0%)	16 (40,0%)	4 (10,0%)	5 (12,5%)
Personal empowerment & social responsibility	1 (2,5%)	14 (35,0%)	19 (47,5%)	1 (2,5%)	5 (12,5%)
Communication	0 (0,0%)	4 (10,0%)	17 (42,5%)	8 (20,0%)	11 (27,5%)
Collaboration	0 (0,0%)	3 (7,5%)	10 (25,0%)	16 (40,0%)	11 (27,5%)

As shown in Table 2, most of the benefits of the art program, through artful thinking, are observed in children's social-emotional development, interpersonal relationships, and personal empowerment and social responsibility.

The third research question investigates the possibility of changes in the level of children's thinking as a result of participating in the art program through artful thinking. The results showed that significant changes (42,5%) were observed in the level of children's thinking due to their engagement with the program. Table 3 presents the frequency and the percentage of the degree of change in children's thinking as a result of their participation in the art program.

Table 3: Changes in the Level of Children's Thinking through the Implementation of the Art Program via Artful Thinking

Degree of change	n	Percentage (%)
Not at all	0	0,0%
Slightly	6	15,0%
Moderately	17	42,5%
Very	10	25,0%
Extremely	7	17,5%

The fourth research question aimed to record possible changes in children's modes of expression as a result of participating in the art program through artful thinking. Table 4 presents the percentage and the frequency of potential changes in the way children express themselves as a result of their participation in the art program.

Table 4: Changes in Children's Modes of Expression
through the Engagement of the Art Program via Artful Thinking

Degree of change	n	Percentage (%)
Not at all	0	0,0%
Slightly	2	5,0%
Moderately	17	42,5%
Very	20	50,0%
Extremely	1	2,5%

According to Table 4, it is evident that there were significant changes (50,0%) in the children's modes of expression as a result of participating in the art program through artful thinking technique.

The fifth research question aimed to record the degree of enhancement of children's cognitive functions through their engagement with the art program based on artful thinking. Data analysis revealed that critical thinking, observation skills, and inquiry were significantly enhanced. Table 5 presents the degree of enhancement in children's cognitive functions resulting from their involvement in this specific program.

Table 5: Enhancement of Children's Cognitive
Functions through their Involvement in the Art Program

	Not at all	Slightly	Moderately	Very	Extremely
Critical thinking	0 (0,0%)	2 (5,0%)	19 (47,5%)	14 (35,0%)	5 (12,5%)
Understanding	0 (0,0%)	2 (5,0%)	18 (45,0%)	13 (32,5%)	7 (17,5%)
Activation of reflective thinking	0 (0,0%)	3 (7,5%)	18 (45,0%)	12 (30,0%)	7 (17,5%)
Observation skills	0 (0,0%)	2 (5,0%)	16 (40,0%)	19 (47,5%)	3 (7,5%)
Creativity	0 (0,0%)	2 (5,0%)	15 (37,5%)	15 (37,5%)	8 (20,0%)
Questioning	0 (0,0%)	1 (2,5%)	17 (42,5%)	17 (42,5%)	5 (12,5%)
Inquiry	0 (0,0%)	1 (2,5%)	19 (47,5%)	15 (37,5%)	5 (12,5%)
Information analysis	0 (0,0%)	2 (5,0%)	17 (42,5%)	16 (40,0%)	5 (12,5%)
Justification-providing explanations	0 (0,0%)	3 (7,5%)	16 (40,0%)	17 (42,5%)	4 (10,0%)
Oral language enhancement	0 (0,0%)	2 (5,0%)	12 (30,0%)	21 (52,5%)	5 (12,5%)

The sixth research question aimed to investigate the degree of children's active participation in the instructional interventions through an inquiry-based and discovery-oriented approach. Data analysis showed that children participated quite satisfactorily (42,5%) in the art program through various learning experiences based on personal discovery and investigation. Table 6 presents the percentage and the frequency of

children's participation in inquiry-based learning processes and discovery-oriented approaches to knowledge.

Table 6: Children's Participation through Inquiry-Based and Discovery Learning

Children's participation in an investigative and exploratory manner	n	Percentage (%)
Not at all	0	0,0%
Slightly	2	5,0%
Moderately	17	42,5%
Very	14	35,0%
Extremely	7	17,5%

The seventh research question aimed to record the methodological approaches and teaching practices adopted by the pre-service kindergarten teachers for the implementation of the art program using the technique of artful thinking. According to Table 7, the most prevalent choices were collaborative learning, differentiated instruction, and play-based learning, followed by brainstorming and question-and-answer strategies.

Table 7: Methodological Approaches and Teaching Practices

	Not at all	Slightly	Moderately	Very	Extremely
Brainstorming of ideas & experiences	0 (0,0%)	6 (15,0%)	19 (47,5%)	9 (22,5%)	6 (15,0%)
Question & answer	0 (0,0%)	9 (22,5%)	16 (40,0%)	14 (35,0%)	1 (2,5%)
Problem solving	0 (0,0%)	10 (25,0%)	12 (30,0%)	13 (32,5%)	5 (12,5%)
Demonstration	9 (22,5%)	3 (7,5%)	10 (25,0%)	13 (32,5%)	5 (12,5%)
Modeling	11 (27,5%)	12 (30,0%)	5 (12,5%)	7 (17,5%)	5 (12,5%)
Inquiry-based learning	0 (0,0%)	14 (35,0%)	9 (22,5%)	8 (20,0%)	9 (22,5%)
Cooperative learning	0 (0,0%)	0 (0,0%)	7 (17,5%)	23 (57,5%)	10 (25,0%)
Differentiated learning	7 (17,5%)	10 (25,0%)	21 (52,5%)	1 (2,5%)	1 (2,5%)
Play-based learning	0 (0,0%)	0 (0,0%)	3 (7,5%)	18 (45,0%)	19 (47,5%)
Experiential learning	0 (0,0%)	8 (20,0%)	15 (37,5%)	8 (20,0%)	9 (22,5%)

The eighth research question aimed to investigate the extent to which higher-order thinking skills were utilized by the children during the questioning process. Table 8 presents the frequency and the percentage distribution of the activation of higher-order thinking skills, as recorded during the implementation of the instructional interventions.

Table 8: Use of Higher-Order Thinking Skills

Use of higher-order thinking skills	n	Percentage (%)
Not at all	0	0,0%
Slightly	2	5,0%
Moderately	19	47,5%
Very	12	30,0%
Extremely	7	17,5%

Table 8 shows that children develop, activate, and apply critical, analytical, and creative thinking skills to a considerable extent (47,5%) when they are asked questions connected to the art program.

The ninth research question aimed to record the ways in which pre-service kindergarten teachers utilized ICT in the art program through the method of artful thinking. According to Table 9, the majority of the sample (47,5%) used ICT as a tool to support and frame their instructional intervention. In contrast, 60,0% of the sample did not use ICT at all as a means to disseminate or share the children's artistic creations.

Table 9: Use of ICT

	Not at all	Slightly	Moderately	Very	Extremely
Visual aid	3 (7,5%)	4 (10,0%)	9 (22,5%)	13 (32,5%)	11 (27,5%)
Creative tool	9 (22,5%)	18 (45,0%)	4 (10,0%)	4 (10,0%)	5 (12,5%)
Information retrieval tool	1 (2,5%)	12 (30,0%)	16 (40,0%)	10 (25,0%)	1 (2,5%)
Supportive tool for instructional intervention	0 (0,0%)	0 (0,0%)	17 (42,5%)	19 (47,5%)	4 (10,0%)
Medium for sharing children's work	24 (60,0%)	0 (0,0%)	9 (22,5%)	4 (10,0%)	3 (7,5%)

The final research question aimed to capture the views of the pre-service kindergarten teachers regarding the positive and negative aspects of the instructional interventions of the art program. According to Table 10, the most important advantages identified were the introduction and familiarization of children with global art, the development of 21st-century skills, the improvement of their oral, written, and multilingual communication, and the enhancement of their ability to respond to questions with clarity and semantic completeness.

Table 10: Advantages of the Instructional Interventions

Advantages	n	Percentage (%)
Familiarization of children with global cultural heritage & awareness of the value of art	39	97,5%
Artistic expression of children through various means, techniques, & new materials	29	72,5%
Acquisition of new knowledge through experiential & playful learning	17	42,5%
Development of children's imagination, observational skills, & aesthetic judgment	24	60,0%
Enhancement of children's aesthetic literacy	23	57,5%
Improvement of 21st-century skills (critical thinking, creativity, collaboration, communication)	37	92,5%
Introduction of children to illustrated books	16	40,0%
Improvement of children's oral, written, & multilingual communication	37	92,5%
Development of children's ability to formulate well-supported answers based on critical thinking & data analysis	33	82,5%
Strengthening of children's ability to pose accurate & purposeful questions for inquiry & analysis	37	92,5%
Development of children's emotional self-expression	17	42,5%

Finally, according to Table 11, the most significant disadvantages concerning the instructional interventions of the art program through artful thinking routines were the cost of purchasing materials for each instructional intervention, and the difficulties encountered by pre-service kindergarten teachers when attempting to explain some questions of artful thinking to the young children.

Table 11: Disadvantages of the Instructional Interventions

Disadvantages	n	Percentage (%)
Limited duration of the instructional intervention	23	57,5%
Cost of materials required for the instructional intervention	35	87,5%
Difficulty in explaining some questions of A.T. to the children by pre-service kindergarten teachers	27	67,5%
Children's feelings of frustration due to posing incorrect questions and giving wrong answers	20	50,0%
Children's sense of fatigue	19	47,5%

5. Discussion

As evident from the presentation of the results, it is determined that the content of artful thinking and thinking routines can be creatively integrated with the arts within the kindergarten setting, thereby supporting children's cognitive, emotional, and aesthetic development.

The cultivation of thinking and creativity in young children is a primary objective of modern early childhood education. In this context, the arts serve not only as a medium

for expression and communication, but also as a rich environment for developing cognitive and metacognitive skills, as well as enhancing critical thinking (Freedman, 2008; Knight, 2010). The integration of pedagogical methods that promote profound understanding and reflection, such as artful thinking routines, has opened up new avenues for learning in early childhood education.

The findings indicate that artful thinking plays a significant role in enhancing essential skills such as observation, interpretation, argumentation, and collaboration. The thinking routines serve as structured tools that assist children in articulating, justifying, and reflecting on their thinking, thereby promoting their critical reflection. Similar findings are reported in the international literature, which validates the application of art as a pedagogical instrument to foster the development of critical and creative thinking, emotional intelligence, and the expression of children's internal experiences (Gholam, 2018; Tishman & Palmer, 2006).

Connecting these tools with the field of the arts in early childhood education is not only practical but also profoundly pedagogical. It helps children to “think through art”, express their emotions and experiences non-verbally, cultivate aesthetic sensitivity, and interpret their surroundings in a personal manner (Freedman, 2008). Art is regarded not as a peripheral aesthetic object, but rather as a catalyst and a foundation for thinking, inquiry, expression, and creative action.

In terms of the pedagogical application of art within a kindergarten setting, it seems to extend beyond a simple aesthetic experience or creative activity. A well-structured program that engages with global art can serve as a catalyst for stimulating cognitive processes such as observation, interpretation, association, synthesis, justification, argumentation, reflection, and empathy (Hetland, 2015). Therefore, art transforms into a cognitive instrument and a “pathway” to thought, especially when supported by effective teaching strategies like artful thinking routines (Tishman & Palmer, 2006).

The method of utilizing global artworks from diverse historical eras, cultures, and artistic styles allows young children to connect on various levels of meaning and emotional resonance. Art pieces function as multimodal texts through which children can discern narratives, feelings, symbols, and human experiences (Wright, 2012). Through focused pedagogical support, even preschool children can cultivate forms of emerging critical reasoning. The emphasis is not on discovering the “correct answer” but rather on the cognitive process and metacognition, which are essential components of critical thinking skills. Interaction with the artworks of various painters can elicit inquiries, inspire interpretations, and ignite creative actions, thereby enhancing language acquisition, observational abilities, and personal initiative (Vecchi, 2010).

Although critical thinking is often linked to older age groups, studies indicate that even children aged 4–6 can articulate reasoned viewpoints, reflect on the emotions of others, and grasp complex meanings when given appropriate support (Daniel & Auriac, 2013). Art offers a secure and open environment for the cultivation of such skills. In fact, critical reasoning in early childhood does not manifest as logical proofs but is articulated

through hypothesis generation, visual justification, and contemplation of various perspectives. The application of artful thinking routines within the context of this art education program enabled children to participate in this process in a natural, playful, and unrestricted manner.

The analysis of the findings concerning the advantages of incorporating artful thinking in a kindergarten setting is particularly noteworthy, as it demonstrates a significant improvement in children's emotional intelligence, social abilities, personal expression, and collective accountability. Art acts as a medium for self-understanding and understanding others, a dialogical space, and a means of attributing meaning to experiences. When utilized effectively, it can aid in the development of thoughtful, emotionally mature, and socially responsible individuals from a young age (Efland, 2002; Eisner, 2002).

Regarding teaching approaches and strategies, the choices of the pre-service kindergarten teachers are theoretically consistent with the principles of artful thinking, as they encourage active engagement, expression, dialogue, and reflective thinking. The collaborative learning model is particularly effective in fostering a culture of thinking and is a fundamental principle of Project Zero (Ritchhart et al., 2011). Similarly, the differentiated instruction model, which aligns with artful thinking, enhances each child's voice and pace in reflective dialogue (Tomlinson, 2014). The playfulness of artful thinking facilitates the natural merging of thought and action, thereby making reflective processes more accessible for children. The preference for these approaches aligns with the educational philosophy of artful thinking, which perceives thinking as a dynamic, experiential, social, and interpretive process.

The integration of Information and Communication Technologies (ICT) has become a fundamental aspect of contemporary educational practices. Research indicates that 47,5% of pre-service kindergarten teachers employ ICT as a supportive resource in their teaching methods, reflecting an increasing trend towards the incorporation of technological tools in educational practices. Nevertheless, a considerable segment of the sample (60,0%) refrains from utilizing ICT for the purpose of sharing or promoting children's creations, which underscores the challenges in effectively utilizing digital tools for communication and enhancing the visibility of learning activities. This situation underscores the necessity for additional training in ICT, which should focus not only on supporting instructional methods but also on promoting communicative and outward-facing pedagogical practices through technology.

The overall assessment of the art program by pre-service kindergarten teachers indicates that utilizing artworks as a foundation for thought, discussion, and creative expression can serve both:

- a) pedagogically, as a stimulus for the development of multidimensional skills, and
- b) didactically, as a framework that links learning with aesthetic experiences and personal meaning.

Concurrently, this methodology appears to foster participation, cultural awareness, and the active involvement of children in engaging dialogues with their

surrounding environment — a goal that is entirely consistent with the tenets of modern early childhood education.

Despite the positive and extensive outcomes of the art program that utilized artful thinking — which improved various aspects of children's learning and development — pre-service kindergarten teachers also recognized significant challenges and drawbacks faced during the implementation of the instructional interventions. These challenges included the increased cost of materials required for the activities and the difficulty children had in understanding certain questions and concepts associated with artful thinking routines. The financial burden issue highlights a persistent challenge in educational practice concerning insufficient material and technical support for innovative or aesthetically demanding programs. In early childhood education, where experiential learning is crucial, inadequate funding can obstruct the application of pedagogically beneficial approaches such as artful thinking. Ultimately, the challenges children encountered in comprehending some of the thinking routines associated with artful thinking indicate the necessity for a developmentally suitable environment, which demands flexibility, adaptation, and a comprehensive understanding of children's cognitive abilities (Vygotsky, 1978).

6. Conclusion

This study constitutes an attempt to investigate the contribution of art to preschool settings through the implementation and evaluation, by pre-service kindergarten teachers, of an educational art program focused on the artworks of famous painters, using the artful thinking routines.

The primary conclusions drawn from this study emphasize the following aspects:

- a) Art for young children serves as a significant cognitive and metacognitive instrument. Through engaging with artworks, children are encouraged to observe, interpret, articulate emotions, and share in reflective and synthesizing processes.
- b) Artful thinking fosters the development of skills such as observation, interpretation, reasoning, self-regulation, and empathy. Thinking routines provide children with a structured framework for articulating and evolving their ideas.
- c) The nurturing of early critical and creative thinking is achievable during preschool years. Even children aged 4–6 can formulate hypotheses, justify their reasoning, and contemplate the emotions of others when supported by suitable teaching tools and attentive pedagogical guidance.
- d) Art contributes to language development, personal agency, and the formation of an individual voice. Concurrently, it creates an environment for expressing internal experiences and cultivating social awareness and responsibility.
- e) Cooperative, differentiated, and playful teaching methodologies are regarded as particularly effective, as they resonate with the fundamental principles of artful thinking and promote experiential and participatory learning.

- f) While ICT is extensively utilized as a supportive resource in education, its application for sharing and showcasing children's creations is still limited. This underscores the necessity for training pre-service kindergarten teachers in digital competencies that enhance communication and the external engagement of educational practices.
- g) The effective execution of complex and innovative programs necessitates sufficient material and technical resources, along with careful modification of teaching strategies to align with the developmental needs and capabilities of young children.

In summary, the implementation of artful thinking through art in preschool settings stands out as an innovative pedagogical approach that offers considerable advantages for learning and development. By utilizing art as a vehicle for thought, emotion, and cultural insight, it fosters children's creativity, engagement, and reflective thinking. It is crucial to invest in appropriate teacher training, technical assistance, and flexible educational programs to ensure their effective integration into daily educational practices.

7. Research Limitations – Suggestions

The current research reveals specific limitations, mainly recognized along two principal axes. As with any qualitative approach, the basic aim is to explore the personal views and experiences of the participants. Although the sample is considered adequate for the purposes of this case study, the findings cannot be generalized to the wider population of pre-service kindergarten teachers, as the focus remains on a specific context and set of conditions.

An additional issue concerns the potential subjectivity of the sample and the possible influences on the reliability of the responses. It is possible that the participating pre-service kindergarten teachers expressed views aligned with socially desirable attitudes or were influenced by the complex role of the academic supervisor, who acted simultaneously as instructor and researcher.

For future research, it is proposed that longitudinal studies be conducted to examine the long-term impact of implementing artful thinking routines on the development of children's critical and creative thinking, emotional intelligence, and social maturity. It would also be beneficial to evaluate the effectiveness of artful thinking in diverse educational settings (urban, semi-urban, rural), or through comparative analyses between schools that apply this method and those that follow conventional approaches.

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Conflict of Interest Statement

The author declares no conflicts of interest.

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