

Chapter # 27

EMBODIED LEARNING THROUGH APPROACHING WORKS OF ART IN THE EDUCATION OF FUTURE KINDERGARTEN TEACHERS

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ABSTRACT

This paper aims to explore embodied learning through approaching works of art in the context of educating future kindergarten teachers and to contribute to the application of contemporary theory of embodied cognition in Pedagogical Departments. The study highlights the pre-existing perceptions of future kindergarten teachers regarding the use of embodied learning through approaching works of art in the classroom or in a museum environment and proposes, based on students' concerns and needs, a workshop grounded in this approach. A two-phase mixed research study was conducted. In the first phase, 53 undergraduate students completed an initial questionnaire, followed by analysis of their responses. Based on the findings, a four-phase workshop was designed and implemented, simulating experiential embodied learning practices for the school classroom. In the second phase, 23 students from the initial sample participated in the workshop and completed a second questionnaire. Data were analyzed using descriptive statistics and thematic analysis. Findings from the first phase indicate that future kindergarten teachers associate artistic, physical, and cultural experiences with key aspects of comprehensive preschool development. Reflections from the second phase revealed deeper emotional engagement's motor activation, empathy, creativity, and participation in learning, highlighting the workshop's potential in teacher education.

Keywords: embodied cognition, experiential learning, higher education, museum pedagogy, psychomotor education.

1. INTRODUCTION

Despite the insistence on traditional mind-centered teaching methods, which separate the body from the mind and have the learner sitting in a chair in a classroom, listening and writing, it is now increasingly recognized that movement and the experiences associated with it play an important role in the learning process (Macrine & Fugate, 2022; Wilson & Foglia, 2015). From early childhood, movement and physical experience play a crucial role in the development of cognition and understanding (Pourkos, 2015; Kosmas & Zaphiris, 2018; Barsalou, 2008). However, teacher education programs often focus on theoretical knowledge and provide limited guidance on how movement or museum visits can be integrated in the teaching practice (Koufou, 2025; Wu, 2024; Hilde & Ørbæk, 2024; Dimitriadi & Malafantis, 2022). This creates a disconnect between the teaching practices and the sensory, embodied experiences that characterize the learning process. In recent years, at the Department of Preschool Education at the University of Crete, we have begun to address this disconnect by incorporating embodied learning activities (such as guided sensory-motor games, games involving emotional engagement, body expression, and improvisation) into the curriculum, often using works of art as a starting point (Trouli, & Trouli, 2025).

2. BACKGROUND

2.1. Embodied Cognition and Embodied Learning

The theory of embodied cognition, formulated in the 1990s, argues that the state in which our body interacts with our cognitive processes (Barsalou, 2008; Wilson & Golonka, 2013; Wilson & Foglia, 2015). It is rooted in the phenomenological theory of Martin Heidegger and Maurice Merleau-Ponty (1962); according to this theory, the physiology of the human body and the environmental experiences an individual has with their body determine the way they think (Vasilaki, 2023; Kai-Kee, Latina & Sadoyan, 2020). The body and its sensory-motor capabilities serve as a point of orientation in the environment and, as such, a fundamental landmark for learning, developmental, and cognitive experiences (Pourkos, 2015). Knowledge does not dwell in abstract and symbolic representations but is built through sensory-motor interactions with the environment, where thought, language, and cognitive processes are intrinsically connected to the body. Embodied learning is not simply an experiential process, but the basis of cognitive activity driven by the body (Kallinou, 2021). In embodied learning, movement must be intertwined with the learning content to strengthen meaningfulness.

By changing the traditional ways of teaching and learning, embodied learning uses the body, the senses, the mind and the environment (Shapiro & Stolz, 2019; Paniagua & Istance, 2018). As an educational method, embodied learning is growing in popularity in the modern education system. It is described as a kinesthetic teaching method, predominantly involving the reproduction of movements and gestures, as well as emotional engagement. The student takes on an active role, where elements of their personality, sensations, thoughts, and emotions become the focus. The body no longer serves as a sterile "depository" of knowledge but is transformed into the primary teaching tool, both inside and outside the classroom (Barsalou, 2010). By combining information with a kinesthetic stimulus that excites the student's interest, the brain is thus stimulated, converting short-term memory into long-term memory and ultimately cementing that experience as knowledge (Kallinou, 2021; Smyrniou, Sotiriou, Georgakopoulou & Papadopoulou, 2016). Theater and dance are the main ways to do this (Vasilaki, 2023; Papadopoulos & Mamali, 2021).

Especially for children, motor and perceptual experiences form the basis of education (Quarello, 2024; Watson, & Delaney, 2024). Activities and educational environments that engage movement and encourage students to move in specific ways enhance the learning process. In addition, embodied educational interventions and interactions make knowledge accessible to all students, providing them with more opportunities for active participation (Foglia & Wilson, 2013; Kosmas & Zaphiris, 2018).

Research shows that embodied approaches help students understand complex or abstract concepts through physical and emotional experiences (Papadopoulos & Mamali, 2021; Smyrniou et al., 2016). For example, theater and movement have been successfully used in education to address sensitive issues such as the refugee experience (Trouli, 2023). This is linked to international pedagogical trends that call for the development of innovative teaching approaches beyond oral and linguistic methods, through the integration of experiential and creative activities (Paniagua & Istance, 2018). Moreover, research in arts education shows that physical engagement with art can deepen participation and understanding (Hubard, 2007; Kukkonen, 2022). Even within adult education, embodied experiences are recognized as a powerful learning tool (Freiler, 2008). Overall, these findings highlight embodied learning's potential to promote engagement, empathy, and deeper understanding; elements that are particularly important in the education of teachers.

2.2. Embodied Learning through Works of Art in Museums or in the Classroom

Museums, as non-typical learning environments, are excellent settings for embodied learning to flourish. They offer multimodal, comprehensive experiences that engage both mind and body (Wanttie, 2024; Kai-Kee et al., 2020). Contemporary posthumanist approaches in education argue that learning is distributed across bodies, objects, and environments rather than confined to the individuals' minds. In the context of museums, this implies that exhibits and works of art can be considered to be "active participants" in the learning process rather than merely passive objects (Hackett, Holmes, & Macrae, 2020). In recent years, a "body-centered pedagogy" has emerged in museums, encouraging visitors to engage with exhibits using their bodies and all their senses, rather than being limited to sight and hearing (Christofalou, 2021). This physical and sensory engagement can offer more personal and meaningful interpretations of works of art.

However, transporting young children from school to the museum is often not easy. Thanks to the development of emerging technologies, and the materials provided by museums, works of art can be displayed and used in the classroom (Kalesopoulou & Trouli, 2025). In fact, teachers can employ the Gallery Walk, a technique that engages learners physically and encourages active participation in the learning process (McCafferty & Beaudry, 2017).

A research gap has been identified in the field of teacher education between the teaching/learning process and the sensory and embodied experiences (Hilde & Ørbæk, 2024). A lack of courses on the utilization of art and museum experiences through embodied learning, both in the classroom and in the museum, has also been identified by both future and current educators (Koufou, 2025; Sotiropoulou-Zormpala, Trouli & Linardakis, 2010; Sotiropoulou-Zormpala, Trouli & Linardakis, 2015; Dimitriadi & Malafantis, 2022; Oikonomidis & Trouli, 2022; Trouli, 2023).

2.3. Purpose and Research Questions

This study investigated the perceptions of students in the Department of Preschool Education at the University of Crete concerning the use of embodied learning when approaching works of art in the classroom or in a museum environment. More specifically, it investigates how future kindergarten teachers perceive the use of embodied learning through the approach to works of art. A workshop was subsequently designed, based on the perceptions and needs of the participants, applying this approach in practice, and the participants' feedback was reviewed. The research questions prior to the implementation of the workshop focus on: (a) investigating the participants' general perceptions and experiences of museums, (b) researching their theoretical perceptions and expectations of embodied learning, (c) recording their perceptions on the role that movement plays in learning and development, and (d) exploring the associations between the participants' perceptions of museums and the contributions of embodied learning to the comprehensive development of children. In addition, following the implementation of the workshop, the research questions focused on (a) evaluating the pedagogical experience of the workshop, (b) the difficulties and obstacles in implementing embodied learning, and (c) perceptions of embodied learning and the experiences associated with it.

3. METHODOLOGY

3.1. Participants

The research sample in the first phase of the study consisted of 53 undergraduate students ($n = 53$), of whom 51 were women and 2 were men, with the main age distribution being 20-22 years old. This ratio reflects the actual demographic composition of students in Preschool Education Departments in Greece. All participants were in their final two years (3rd and 4th year) of their studies at the Department of Preschool Education at the University of Crete during the academic year 2024-2025. The sample was selected through convenience sampling, as the participants attended the Department's Psychomotor and Museum Education seminars during the spring semester of that year. The students who took part in the research had an academic background in arts education, including courses focused on preschool age, and specifically courses in preschool pedagogy, aesthetic education, psychomotor education, music and rhythmic education, museum education, theater education and visual arts.

In the second phase of the study, from the initial sample of 53 students, a convenience sample consisting of 23 female students ($n = 23$) was selected from an existing seminar class. This sample's sub-group was designated as the group for the workshop.

3.2. Research Design

This study followed a mixed two-phase research design, combining, on the one hand, a survey of the students' perceptions of their previous museum experience and embodied learning, and, on the other hand, the design, implementation, and evaluation, by the sample sub-group, of a workshop based on embodied learning. The initial digital questionnaire was completed by the participants in the first phase of the research during February 2025, followed by the design and implementation of the workshop with the research sample in early March 2025, and the completion of the final digital questionnaire by the participants. The workshop was implemented as part of a seminar course in collaboration with the Department's psychomotor and museum education instructors and lasted two hours. The research was approved by the Ethics Committee of the Department of Preschool Education (641/19.06.2024).

3.3. Research Tools

The data were collected through two online digital questionnaires (Google Forms) designed for the purposes of the study. The initial digital questionnaire consisted of 19 closed-ended questions on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) and 8 open-ended questions; it was completed by all participants in the first phase of the study. Specifically, the questions in the first digital questionnaire were grouped into three sections: 1) general perceptions and experiences about museums, 2) theoretical perceptions and expectations about embodied learning, and 3) perceptions about the role of movement in learning and development. The second digital questionnaire consisted of 11 closed-ended questions on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) and 10 open-ended questions; it was completed by the sample sub-group that participated in the workshop. Specifically, the questions in the second digital questionnaire were grouped into three sections: 1) evaluation of the pedagogical experience of the workshop, 2) difficulties and obstacles in implementing embodied learning, and 3) perceptions of embodied learning and the experiences associated with it.

The responses to the open-ended questions in both digital questionnaires were subjected to thematic content analysis (Tsiolis, 2018), where repetitive ideas were systematically encoded, classified into categories, and transformed into dichotomous variables (yes = 1, no = 0). Next, the absolute frequency (N) and relative percentage (%) of students who reported each category were determined to record the distribution of topics/categories across the sample. The answers to the closed-ended questions were analyzed quantitatively by calculating descriptive statistics (mean and standard deviation) for each topic/category (Chalikias, Lalou, & Manolesou, 2015).

Both digital questionnaires were checked for internal consistency of their questions (Cronbach's Alpha reliability test). Internal consistency was assessed for each individual section of each digital questionnaire.

On the digital questionnaire for the first phase of the study, which was completed by 53 students, it was found that, in the first section, "general perceptions and experiences about museums", the reliability of the 15 items in the section was considered to be good ($\alpha = 0.783$, $N = 53$). In the second section, "theoretical perceptions and expectations about embodied learning", the reliability of the 36 items was considered to be high ($\alpha = 0.964$, $N = 52$), and finally, the third section, "perceptions about the role of movement in learning and development", presented good internal consistency in the 8 items that were completed ($\alpha = 0.833$, $N = 53$). These values in all three sections of the digital questionnaire indicate that the questions in the section reliably measure the same contextual field (Tavakol & Dennick, 2011).

Similarly, for the digital questionnaire completed by the 23 students after the workshop, it was found that, in the first section, "evaluation of the pedagogical experience of the workshop", the reliability of the 16 items in the section was good ($\alpha = 0.883$, $N = 23$). In the second section, "difficulties and obstacles in implementing embodied learning", the reliability of the 16 items was adequate ($\alpha = 0.791$, $N = 23$). Finally, the third section, "perceptions of embodied learning and the experiences associated with it", exhibited high internal consistency in the 18 items that were completed ($\alpha = 0.912$, $N = 23$). Overall, the reliability values across all sections of both digital questionnaires indicate that the questions reliably measure the same contextual field (Tavakol & Dennick, 2011).

4. RESULTS OF THE FIRST-PHASE DIGITAL QUESTIONNAIRE

4.1. General Perceptions and Experiences about Museums

Regarding the first research question about the perceptions of the 53 students and their experiences of the museum, each student was requested to write down three words that came to mind when they heard the word museum, three things they liked about museums, and three things they thought were missing from museums. They were also asked to answer how visiting a museum or using works of art in the classroom would help preschool-aged children.

In their attempt to capture the notion of "museum," the students used the words statues ($N = 21$, 39.6%), history ($N = 16$, 30.2%), art ($N = 16$, 30.2%), exhibits ($N = 15$, 28.3%), paintings ($N = 14$, 26.4%), and culture ($N = 12$, 22.6%). Students perceive museums as places of: art and exhibits (objects, sculptures, paintings, jewelry, frescos, pottery, tombs, photographs) ($N = 36$, 68%), information, exploration, discovery, and learning (activities, educational actions, guided tours, visual material, etc.) ($N = 19$, 36%). According to the students, significant deficiencies in museums are observed in the following areas: museum education (museum educational activities, experiential activities, interactivity, hands-on interaction with the exhibits, games, entertainment, audio tours) ($N = 28$, 52.8%), exhibitions and collections (lack of technology, methods of presenting exhibits, lack of music) ($N = 17$,

32.1%), organizational issues (space and visitor management, more staff, better information and promotion, spaces for children) (N = 13, 24.5%), and on issues of access (physical access and access for people with disabilities, cognitive access, free admission, cheaper tickets, funding) (N = 12, 22.6%).

4.2. Theoretical Perceptions and Expectations for Embodied Learning through Approaching Works of Art

Regarding the theoretical perceptions and expectations of the 53 study participants on embodied learning, that utilizing works of art in the classroom or visiting a museum helps enrich the children's stimuli and experiences (M = 4.5, SD = 0.7), helps in the acquisition of knowledge (M = 4.5, SD = 0.6), supports their aesthetic development (M = 4.4, SD = 0.8), the development of their cultural awareness (M = 4.5, SD = 0.7), the development of their empathy (M = 4.3, SD = 0.9), their social development (M = 4.2, SD = 0.8), their linguistic development (M = 4.1, SD = 0.8), the development of their physical expression (M = 4.0, SD = 1.1), the development of their civic awareness (M = 4.0, SD = 0.9), the development of their environmental awareness (M = 4.0, SD = 1.0), and, finally, the development of their nonverbal expression (M = 4.0, SD = 1.3). Subsequently, the application of embodied learning through approaching works of art in the kindergarten classroom finds the students in our sample to be in agreement (M = 4.4, SD = 0.75). In particular, they believe that embodied learning can contribute to a better understanding and consolidation of knowledge (N = 17, 37.8%). When asked about the contribution of movement to the sensory experience of exhibits and works of art, students seem to "agree" (M = 4.2, SD = 0.9). In fact, they believe that movement contributes to a better understanding and consolidation of knowledge through experience, body, and senses (N = 24, 45%). Students also "agree" that, through movement and awareness of the exhibits, we can address difficult concepts, such as the issue of refugees (M = 4.0, SD = 1.14), and point out that sensory and movement-based engagement with exhibits can strongly enhance empathy and deepen understanding of complex or difficult experiences/situations (N = 21, 40%); they believe that movement is a good way to approach difficult topics (N = 13, 28.9%).

4.3. Perceptions on the Role of Movement in Learning and Development

The perception that works of art can serve as motivation for children's motor activation is "agreed" upon by the 53 students (M = 4.33, SD = 0.79); 35.8% of them (N = 19) believe that works of art are a source of inspiration for body representation, but they point out that the application of appropriate educational approaches and works of art is required (N = 13, 25%). Lastly, the students in the sample "agree" that movement and the experiences associated with it play an important role in the processes of: emotional expression (M = 4.40, SD = 1.0), physical and motor development (M = 4.41, SD = 1.06), social development (M = 4.26, SD = 1.04), education and learning (M = 4.24, SD = 1.01).

4.4. Correlation Analysis

In order to gather feedback from participants on the design of the workshop on embodied learning through approaching works of art, we analyzed the correlations between the answers provided by the 53 participants in the initial digital questionnaire.

The analysis showed that the greater the degree to which future teachers believe that children acquire knowledge through works of art in classrooms or cultural spaces, the more likely they are to understand that: the children's stimuli and experiences are enriched (strong correlation, $r = 0.708$, $p < 0.001$), their empathy develops ($r = 0.621$, $p < 0.001$), their

linguistic development is enhanced ($r = 0.619$, $p < 0.001$), their cultural and civic awareness is strengthened ($r = 0.602$ and $r = 0.531$, $p < 0.001$), their aesthetic development is cultivated ($r = 0.440$, $p = 0.001$), and their physical expression is developed ($r = 0.431$, $p = 0.001$). Furthermore, the more the students in the sample perceive works of art as a motivation for children's motor activation, the more they realize that: the children's cultural awareness is cultivated ($r = 0.567$, $p < 0.001$), their environmental and civic development is strengthened ($r = 0.560$, $p < 0.001$ and $r = 0.419$, $p < 0.05$ respectively), their stimuli and experiences are enriched ($r = 0.481$, $p < 0.001$), their linguistic development is strengthened ($r = 0.478$, $p < 0.001$), their social development is enhanced ($r = 0.476$, $p < 0.001$), and their aesthetic development is cultivated ($r = 0.418$, $p < 0.05$).

The more future teachers believe that using works of art in the classroom or visiting cultural sites develops the children's physical expression, the more they realize that: their empathy is cultivated (strong correlation, $r = 0.713$, $p < 0.001$), their aesthetic and linguistic development is enhanced (strong correlation, $r = 0.711$, and $r = 0.705$, $p < 0.001$), their stimuli and experiences are enriched ($r = 0.600$, $p < 0.001$), and their cultural awareness is strengthened ($r = 0.602$, $p < 0.001$). Furthermore, the more they consider that these experiences develop the children's "empathy," the more they believe that: the children's stimuli and experiences are enriched (strong correlation, $r = 0.709$, $p < 0.001$), their language development is significantly enhanced (strong correlation, $r = 0.759$, $p < 0.001$), their cultural awareness is cultivated to a very high degree (strong correlation, $r = 0.767$, $p < 0.001$), their physical expression and aesthetic development are enhanced (strong correlation, $r = 0.713$, and $r = 0.681$, $p < 0.001$), and their environmental awareness is strengthened ($r = 0.613$, $p < 0.001$).

The more future teachers believe that embodied learning should be applied when approaching works of art in the classroom or in museums, the more they realize that: movement helps children become aware of the exhibits and works of art ($r = 0.459$, $p < 0.001$), through the movement and the exhibits they can approach complex and difficult concepts such as the issue of refugees ($r = 0.453$, $p < 0.01$). Furthermore, the more they recognize the role of movement and experiences in education and learning processes, the more they believe that: children's knowledge acquisition is enhanced ($r = 0.454$, $p < 0.001$), their stimuli and experiences are enriched ($r = 0.448$, $p < 0.001$), and their civic, cultural, and environmental awareness is cultivated ($r = 0.487$, $p < 0.001$, $r = 0.483$, $p < 0.001$ and $r = 0.410$, $p < 0.05$).

Finally, the analysis showed that the more future teachers recognize the importance of movement and experiences for the children's social development, the more they believe that: the children's stimuli and experiences are enriched ($r = 0.450$, $p = 0.001$) and their cultural awareness is strengthened ($r = 0.483$, $p < 0.001$). Similarly, the more they appreciate the role of movement and lived experiences in expressing emotions, the more they realize that: the children enrich their stimuli and experiences ($r = 0.409$, $p < 0.05$) and cultivate their cultural awareness ($r = 0.491$, $p < 0.001$).

The findings indicate that future kindergarten teachers believe that artistic, physical, and cultural experiences are closely linked to central aspects of comprehensive development during the preschool years. Educationally, these findings support the view that embodied, movement-based learning in preschool education is a powerful instrument for the comprehensive development of children (somatic, linguistic, social, aesthetic, cultural, environmental, and civic).

The participants' perceptions also highlight that body expression and empathy are key to how art and culture experiences support language, aesthetic, cultural, and environmental development, and that movement and the embodied perceptual awareness of works of art are an essential means not only for understanding educational material, but also for approaching complex social issues and cultivating civic, cultural, and environmental awareness. These findings also reveal that movement and the experiences that accompany it not only serve as a means of somatic activation but are also closely linked to the enrichment of experiences, cultural awareness, social development, the expression of emotions, and the cultivation of empathy.

Based on these findings, it is pedagogically reasonable to design artwork-engagement activities that include the children's movement, gestures, roles, and body representations, rather than just looking at a painting or discussing it. Without generalizing the results indiscriminately, the data support the gradual and systematic integration of forms of dramatic play, movement and body expression activities, and improvisation activities centered on works of art into the weekly kindergarten schedule, provided that they are further explored in future studies.

5. WORKSHOP DESIGN AND IMPLEMENTATION

Based on the above findings, an embodied learning workshop was designed and implemented with the aim of gathering feedback for the future design of similar workshops. We chose the issue of refugees as a case study because it is a timeless and, at the same time, a very relevant topic. Throughout history, countless people have been forced to leave their homes, persecuted by oppressive regimes, ethnic or religious hatred, and the horrors of war (Loescher, 2021). At the same time, kindergartens across Europe and Greece are welcoming refugee children, and it is important to have such workshops for the professional development of future kindergarten teachers with the aim of raising awareness of the refugee issue among the general population. Furthermore, the choice of refugee issue as a theme reflects the findings of the first phase of the research, where respondents highlighted the role of empathy. A memorial public artwork in Rethymno (an expressive sculpture honoring the refugees of the 1922 Asia Minor Catastrophe) served as the main inspiration and visual reference point for the workshop.

Based on this theme, we identified four sub-themes of the refugee experience, each associated with a color: (1) Uprooting - New Roots / Journey - Boat (blue), (2) Refuge - Hospitality - Hope (white), (3) Homeland - New Homeland - Suitcase (yellow), and (4) Obstacles - Crossings - Borders (green). We selected five to six photographs of works of art or objects for each sub-theme and displayed them in the workshop space structured according to a gallery-based presentation model. The workshop was based on museum education methods, including narrative storytelling, guided questioning (Socratic method), discovery learning, and experiential-creative activities (Nikonanou, 2015).

In terms of practical implementation, the space was decorated with various materials (e.g., fabrics, simple musical instruments, cardboard boxes) and music tracks and narrative excerpts were selected to facilitate deeper immersion in the theme. In addition, excerpts from the oral testimonial accounts of a child refugee from 1922 (Fryganakis, 2022) were used to add authentic voices to the experience.

The following stages present the progression of the workshop activities.

5.1. Stage 1: Music Immersion and Body Activation

We began by inviting the group to close their eyes and listen to a captivating soundscape we named "Music of Destruction". The selected music (Saleas & Vangelis, 1987) created an atmosphere of tension and loss, evoking the feelings of turmoil associated with violent uprooting. During this "embodied listening" phase, participants were encouraged to let the music guide their emotions and physical reactions.

When the participants opened their eyes, we suggested a sequence of movements to physically express elements of the refugee experience: for example, reacting violently to the sound of a war siren, walking with heavy steps full of anxiety, reaching out as if searching for something, taking careful steps backward, walking sideways through an imaginary narrow passage, curling up in fear, walking on tiptoes, hiding, protecting their heads, running or even swimming to escape. We accompanied the movements with sounds from a tambourine to indicate the transitions.

About halfway through this stage, we read aloud a narrative excerpt from the oral testimony: "The ship 'Patris, unforgettable, brought us packed like sardines and distributed us throughout Crete. Our human cargo was unloaded onto black boats out at sea and later dumped at the Venetian port of Rethymno. A pile of rags, body and soul!..." (Fryganakis, 2022).

As the music shifted to another musical track, a melancholic composition by Reboutsika (2000) and then to an emotional theme by Karaindrou (2010), the participants began to move freely around space. They observed their internal, physical reactions (heart beating fast, shivers, muscle tension, emotions surfacing) and connected these sensations with the central themes that we were exploring: xenophobia, loss, and hope.

We continued with an interactive group activity to symbolize the connection but also the obstacles/difficulties created by displacement and resettlement. We gently touched some of the participants, asking them to sit on the floor, defining them as "locals," while the rest remained standing as "newcomers" or "refugees". Then, one participant was handed a ball of yarn, which was passed from one person to another, with everyone saying their name. As the yarn was unraveled, it created a web connecting all the participants.

In the reverse process of wrapping the ball of yarn, each participant was asked to name (metaphorically, as a "refugee" or as a "local") an obstacle/difficulty they had faced when arriving in a new place or welcoming refugees to their place. Participants reported difficulties such as language barriers, finding housing, financial concerns, job hunting, fear of the unknown or experiences of prejudice, and concerns about their children. With each twist of the yarn and the name of the obstacle, the participants physically represented the difficulties they had experienced, but also the bonds that had begun to form in the group between "newcomers" and "locals". After everyone had spoken and the ball of yarn had been wound up, the group agreed that the web formed by the yarn symbolized both the difficulties and the bonds of solidarity between people.

5.2. Stage 2: Exploring Concepts

In the second stage, participants were asked to walk around the space and observe the gallery of images representing the four sub-themes (blue, white, yellow, green). At that point, we discreetly placed a colored sticker on each participant's hand, assigning them to one of the four color-coded groups, without initially revealing what each color represented. They then had to find and gather with other people who had the same color, helping each other discover which sub-theme their color corresponded to.

Once the four groups were formed (one for each sub-theme), they were given time to work on the works of art corresponding to each group's color. We distributed a card with the Thinking Routine: "See-Think-Wonder" (Harvard Project Zero, n.d.) to each group to support their discussion.

The groups had about 20 minutes to process the words and images of their sub-theme and collectively develop a short performance or sequence of movements inspired by their theme. They were encouraged to use any of the available materials (fabrics, musical instruments, objects) and were able to incorporate music or sounds.

Through movement, concept sketches, or gesture mapping, each group created a body "narrative" that connected the concepts of their sub-theme, the objects or symbols (such as the boat, the suitcase, etc.) and the emotions evoked by the works of art. This process allowed them to deepen their understanding of the refugee experience through creative, embodied dialogue within the small group setting.

5.3. Stage 3: Creative Interpretations

In the third stage, each group presented to the other participants the short, embodied performance they had prepared. For example, the "blue" team physically reenacted the act of leaving home and boarding a ship, while the "yellow" team portrayed a mixture of sadness and resilience symbolized by the transport of a suitcase to a new homeland.

As each group presented its work, the other participants acted as spectators, observing how abstract concepts and emotional themes were translated into body expression. These performances allowed everyone to witness multiple interpretations of the refugee experience, each highlighting different aspects through the use of gestures, posture, space, and movement.

The stage of creative interpretations often provoked intense emotional reactions, both in the performers and the audience, as participants connected empathetically with the stories being performed through the body.

5.4. Stage 4: Conclusion and Reflection

In the final stage, all participants gathered for a collective closing and reflecting activity. We gathered again in a circle, while percussion sounds played in the background (a piece by Greek musician Boulgourtzis (1996) whose music combines Eastern and Western elements). While a final narrative excerpt from the 1922 refugee testimony was read, describing a scene in which a barefoot refugee child plays an improvised drum, gradually drawing others into a communal dance, the participants spontaneously began to join in, clapping their hands or moving gently to the rhythm. They were then given small percussion instruments (such as tambourines and wooden clappers), and the group began to respond to the music with synchronized movements and improvised rhythms, symbolically representing a moment of collective catharsis and hope. After this climax, we guided the group through a short sequence of relaxing movements and breathing exercises to release any tension.

A discussion of reflection followed, posing questions such as: "What emotions did you notice emerging during the performances? What did you feel as spectators? If you had been on that crowded pier in 1922, what sensations (touch, sound, sight) do you imagine you would have experienced?" These questions sparked a meaningful dialogue about empathy and connection to the historical experience.

Finally, participants were asked to draw or sketch out a final "embodied" experience or feeling from the workshop, without using words, and to share it with the group if they wished. This exercise was intended to support the transition from physical and emotional experience

to cognitive articulation, as participants were invited to express what they learned or felt in the workshop.

The workshop ended with many participants reporting that the process had been profound and enlightening, and that they appreciated the way movement and art had been combined to convey the refugee experience.

6. RESULTS OF THE SECOND PHASE DIGITAL QUESTIONNAIRE

6.1. Evaluation of the Workshop's Pedagogical Experience

After participating in the workshop, the sample sub-group of 23 students was asked to complete a new digital questionnaire to record their experiences. Regarding the research question on how they evaluated the workshop, the students agreed that it is an appropriate approach for young children ($M = 4.1$, $SD = 0.62$) because of its playful and creative learning through movement activities ($N = 5$, 26%). It helps children express themselves through the art of theater ($N = 5$, 26%) and helps them to relate emotionally to the subject ($N = 4$, 17.4%). However, they felt that the material needed to be adapted to the age of the children ($N = 6$, 26.1%). Finally, some students pointed out the specificity of the workshop topic, noting that in order for young children to deal with such a sensitive issue, they need to be familiar with it ($N = 4$, 17.4%). The answers to the question about what the participants gained from the workshop showed that they understood the connection and contribution of art and movement to experiential learning and to the comprehension of complex topics ($N = 7$, 30%). Many felt more emotionally connected to the refugee issue ($N = 6$, 26%), gained new experiences for future use ($N = 5$, 22%), and experienced freedom of expression and enhanced creativity ($N = 4$, 17.4%). When asked if they would change anything about the workshop, the majority of participants said they were completely satisfied with it ($N = 14$, 61%).

6.2. Difficulties and Obstacles in Implementing Embodied Learning

In response to the research question regarding the difficulties and obstacles in implementing embodied learning in the workshop, some found it difficult to express emotions non-verbally ($N = 6$, 22%) and to adapt to experiential or theatrical techniques ($N = 6$, 22%). When asked whether there were difficulties in utilizing a movement approach to works of art in museums, 35% of the sample ($N = 8$) ($M = 3$, $SD = 1$) agreed, noting that the main difficulties were lack of space ($M = 4.2$, $SD = 0.99$), consistency in following rules ($M = 4.1$, $SD = 1$), and, to a lesser extent, the security guards ($M = 3.1$, $SD = 1.2$). When asked if there is anything that could hinder the use of the movement approach utilizing works of art in the kindergarten classroom, they agreed that there are difficulties ($M = 3.4$, $SD = 0.9$), such as classroom space ($M = 3.8$, $SD = 1.07$), followed by the lack of technical equipment ($M = 3.21$, $SD = 1.2$), and funding ($M = 3.4$, $SD = 1.07$).

6.3. Perceptions of Embodied Learning and the Experiences Associated with it

Regarding the research question about what the students' perceptions of embodied learning were after the workshop, most students agreed that works of art can serve as a motivation for children's motor activation ($M = 4.56$, $SD = 0.58$) and that through movement and the sensory experience of works of art, we can approach difficult concepts such as the refugee issue ($M = 4.78$, $SD = 0.51$), as this approach stimulates children's imagination and creativity, provides experiential understanding of complex issues through movement, theatricality, and sensory appreciation of works of art, and fosters emotional engagement and

empathy. Finally, most students agreed that the workshop met their expectations ($M = 5$ and $SD = 0.4$) and also added that movement and the experiences associated with it play an equally important role in children's education and learning processes ($M = 4.5$, $SD = 0.5$), children's social development processes ($M = 4.6$, $SD = 0.5$), children's emotional expression ($M = 4.7$, $SD = 0.5$), and their physical-motor development ($M = 4.6$, $SD = 0.4$).

7. DISCUSSION

The findings of this study offer insight into how future kindergarten teachers perceive museums, art, and embodied learning. In their responses, the students-teachers predominantly described museums as places of art, exhibits, and history, a perspective consistent with previous research in Greece (Koufou, 2025; Trouli, 2023; Dimitriadis & Malafantis, 2022; Oikonomidis & Trouli, 2022). The frequent appearance of words such as "statues" and "history" in their associative responses reflects the dominance of archaeological and historical museums in the Greek context (Koufou, 2025; Doxanaki & Linardakis, 2022). Although participants recognized museums as places of learning, exploration, and discovery, they also highlighted significant shortcomings, particularly in the areas of educational engagement and accessibility. This criticism is linked to ongoing calls for museums to become more interactive and inclusive spaces for all visitors, including young children (Hackett et al., 2020; Christofalou, 2021).

The strong support of future teachers for incorporating museum visits and art into preschool education is consistent with the international literature on museum education and the development of children (Mavilidi et al., 2022; Trouli, 2023; Dimitriadis & Malafantis, 2022; Oikonomidis & Trouli, 2022). Participants recognized multiple benefits, from enriched sensory experiences to the development of empathy and cultural awareness, confirming that purposefully designed experiences involving works of art or museums can support the comprehensive development of children (Wu, 2024; Sotiropoulou-Zormpala et al. 2015). These perceptions echo previous findings that visits to cultural sites or the use of art in the classroom can enrich the learning experiences and skills of children (Wu, 2024; Trouli, 2023; Dimitriadis & Malafantis, 2022; Oikonomidis & Trouli, 2022). The near unanimous agreement among the participants on the value of these practices shows that the new generation of teachers is positively inclined to incorporate cultural and embodied experiences into their teaching practices.

The students in this study showed a clear appreciation for embodied learning as a pedagogical approach. They agreed that activating the body through movement can deepen the understanding and memorization of art and concepts, which is in line with the scientific approaches of cognitive science to embodied cognition (Watson & Delaney, 2024; Foglia & Wilson, 2013; Barsalou, 2010), as well as educational research highlighting the effectiveness of movement in the learning process (Kosmas & Zaphiris, 2018; Macedonia, 2019). Particularly noteworthy is their perception that movement can help address difficult concepts, such as the complex and sensitive issue of refugees. This reinforces the idea that embodied methodologies can make abstract or emotionally laden topics more accessible and meaningful by physically and emotionally engaging students (Papadopoulos & Mamali, 2021; Smyrniou et al., 2016). The workshop we implemented is a concrete example of this phenomenon by raising awareness of the refugee experience. Participants were able to "experience" historical and social issues in a safe, guided way, transcending the limits of traditional lectures or discussions.

The feedback from workshop participants further highlights the strengths and conditions of using embodied learning in combination with art. Other studies have reported high levels of student engagement in embodied activities in museums (Hilde & Ørbæk, 2024; Kukkonen, 2022; Hubard, 2007) similarly, our participants found the approach extremely appealing, creative, and effective in cultivating empathy. Many described the workshop as playful but also emotionally powerful, showing that it achieved a balance between joy and depth, which is considered ideal in the educational practice (Vasilaki, 2023; Kai-Kee, Latina & Sadoyan, 2020). At the same time, they were practical, pointing out the need to adapt the material for younger ages and that extra care is needed when working with sensitive topics. This reflects a mature understanding that, even though embodied learning is a powerful tool, its implementation must be age-appropriate and mindful of the context.

Despite the fact that the sample size for the second part of the study was small and that in both phases several of the open-ended questions were not completed by the participants, the results of the study are encouraging for the future of teacher education. They show that the new generation of teachers not only values embodied learning but also museum-based activities. The participants' request for workshops and experiential courses in the university curriculum confirms previous observations that such opportunities are currently lacking (Trouli, 2023; Oikonomidis & Trouli, 2022). By incorporating practical experiences, such as the workshop described in this study, teacher education programs can equip future teachers with the confidence and skills to integrate movement, art, and multisensory experiences into their teaching. In this way, we are moving towards an educational model that treats the body as an ally in learning, a change that is supported both by contemporary theories and by the positive results observed in the field (Kosmas & Zaphiris, 2018; Macedonia, 2019).

8. CONCLUSION

In the context of preschool education, the application of embodied learning is not simply an innovative addition, but an integral part of pedagogical practice that responds to the developmental needs of young children. Young children learn naturally through movement, senses, and active exploration; they "think" with their bodies as much as with their minds (Macrine & Fugate, 2022; Macedonia, 2019; Kosmas & Zaphiris, 2018; Foglia & Wilson, 2013). Our research shows that future kindergarten teachers who participated in our research seem to recognize the value of embodied learning. They identified its benefits for the children's understanding, memory, emotional engagement, and social development and expressed their intention to use cultural resources, such as visits to museums and works of art, as stimuli for learning through movement. It is also important that participants highlighted the need for support and training to be able to implement these methods effectively. The workshop we conducted offers an example of how the education of future kindergarten teachers can provide this kind of practical training, immersing them in a hands-on learning experience that they can later adapt to their own classrooms, considering the particularities of preschool age.

The positive reactions of the participants underscore the potential of the workshop as a positive practice in the education of teachers. By engaging with an emotionally laden topic through art, movement, and dramatization, future teachers not only learned about the topic itself, but also directly experienced how embodied methodologies can cultivate empathy, creativity, and critical thinking. Such transformative learning experiences in teacher education can bridge the gap between theory and practice, ensuring that new teachers feel empowered to draw on the full range of human experiences — body, senses, emotion, and

thought — in the learning process (Sotiropoulou-Zormpala, et al., 2010; Sotiropoulou-Zormpala, et al., 2015; Trouli, 2023).

In conclusion, incorporating embodied learning strategies into both teacher education and preschool classrooms has the potential to enrich learning in a comprehensive manner (Watson & Delaney, 2024; Hilde & Ørbæk, 2024; Macrine & Fugate, 2022; Macedonia, 2019). As the participants' testimonies show, there is both enthusiasm and clear evidence for making movement, art, and sensory engagement key elements in the teaching of young children. Enhancing university programs with experiential courses and embodied learning workshops will prepare future teachers to utilize these approaches, creating more dynamic and inclusive learning environments for the next generation of students.

8.1. Limitations of the Study and Suggestions for Future Research

This study was based on a small sample of 53 future kindergarten teachers from a specific geographical context (Crete/Greece), which limits the generalizability of its results. The limited scope of the research dictates the need to investigate perceptions of embodied learning and approaching works of art in broader and more heterogeneous samples of kindergarten teachers to examine the degree of generalization of the findings.

Furthermore, as the research data were based solely on digital questionnaire responses from participants, future studies would benefit from combining digital questionnaires with classroom observation and analysis of learning activities to capture embodied learning in the classroom.

The non-experimental nature of the research does not allow for causal conclusions. Future research with an experimental design and implementation of interventions could investigate any changes induced in indicators such as empathy, body expression, linguistic development, etc., as well as other complex social or ethical issues such as the refugee crisis.

Furthermore, the workshop was designed and implemented for university students, future kindergarten teachers, not for preschool children. Therefore, it is not directly applicable in kindergarten. Future research should be designed and implemented involving preschool children, taking into account their developmental characteristics and needs.

8.2. Pedagogical Implications in Kindergarten

The findings of this study, although derived from a relatively small sample and subject to methodological limitations, are consistent with the international literature on embodied learning, suggesting positive associations between body expression, motor activation, and the development of empathy in preschool education. In this context, it becomes a pedagogically appropriate choice for kindergartens to gradually and consistently incorporate activities involving art appreciation into their curriculum, including sensorimotor games, body expression, role-playing, and body representations, rather than passive viewing or exclusively oral analysis.

The strong correlation with indicators such as empathy and body expression reinforces the perception that embodied experiential approaches are a multidimensional pedagogical tool which contributes significantly to the comprehensive development of children as early as preschool age.

From the perspective of future kindergarten teachers, the use of movement in approaching works of art in the classroom and during visits to cultural sites is not limited to cognitive benefits but is closely linked to the enrichment of the children's experiences and the approach of complex social issues, as well as the cultivation of civic, cultural, and environmental awareness. This suggests that works of art in kindergarten can serve as a "starting point" for interdisciplinary activities involving the body, language, social and

cultural education, and the environment, rather than merely being an isolated museum object. Each work of art can give rise to body representations, discussions, narratives, rules of coexistence, environmental actions, or even collective decisions in the classroom. However, the wider application and generalization of these embodied approaches require further investigation into their effectiveness in future research.

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