



Visual arts museums as learning environments in the undergraduate and postgraduate programmes of the Faculty of Education at the Complutense University of Madrid

Marta García Cano¹ · Paula Gil-Ruiz² · Victoria Martínez-Vérez³

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Abstract

This article addresses the need to bring the museum environment closer to the students of the Faculty of Education at the Complutense University of Madrid (UCM). The motivation for this stems from an observed lack of artistic education among these students, specifically evidenced by a lack of familiarity with the resources and learning opportunities offered by museums. To address this issue, a mixed quantitative-qualitative methodological design was chosen, with a focus on the factors that define artistic education. The research was conducted with a population cohort of UCM students ($N = 476$) including future teachers, pedagogy professionals and social education professionals. The results confirm the initial hypothesis, as 82.2% of the students reported having limited knowledge of museums and their resources. Additionally, 48.3% of the participants considered their artistic education during compulsory education to have been inadequate, and of these, 78.6% stated that their teaching staff lacked the necessary knowledge. In UCM's Laboratorio Pantono innovation project (PID), 88.6% of the students of the Faculty of Education considered museum educational resources to be relevant to their education and recognised their usefulness at all educational stages. This is because these resources facilitate the acquisition of learning related to didactics and curriculum (63.3%), recreation (92.99%), expression (63.30%), and cross-cutting issues (90.3%). Based on these findings, this study underscores the need to integrate museum resources in teacher training programmes.

Keywords museum education · visual arts education · teacher training · cultural awareness and expression · SDG 4

Résumé

Les musées d'arts visuels en tant qu'environnements d'apprentissage dans les programmes de premier et de deuxième cycle de la faculté d'éducation de l'université

Extended author information available on the last page of the article

Complutense de Madrid—Cet article aborde la nécessité de rapprocher l'environnement muséal des étudiants de la faculté d'éducation de l'université Complutense de Madrid (UCM). Cette démarche est motivée par la constatation d'une absence d'éducation artistique chez ces étudiants, qui s'illustre notamment par une méconnaissance des ressources et des possibilités d'apprentissage qu'offrent les musées. Pour répondre à cette question, une méthodologie mixte quantitative et qualitative a été choisie, en mettant l'accent sur les facteurs qui définissent l'éducation artistique. La recherche a été menée auprès d'une cohorte d'étudiants de l'UCM (N = 476), comprenant de futurs enseignants et professionnels de la pédagogie et de l'éducation sociale. Les résultats confirment l'hypothèse initiale, puisque 82,2 % des étudiants ont déclaré avoir une connaissance limitée des musées et de leurs ressources. En outre, 48,3 % des participants ont jugé que l'éducation artistique qu'ils ont reçue pendant leur scolarité obligatoire était insuffisante, et 78,6 % d'entre eux ont déclaré que le personnel enseignant manquait des connaissances nécessaires. Dans le projet d'innovation Laboratorio Pantono (PID), 88,6 % des étudiants de la faculté d'éducation ont estimé que les ressources éducatives des musées sont pertinentes pour leur éducation et ils en reconnaissent l'utilité à tous les stades de l'éducation. Ces ressources facilitent l'acquisition de connaissances liées à la didactique et au programme (63,3 %), aux loisirs (92,99 %), à l'expression (63,30 %) et aux questions transversales (90,3 %). Sur la base de ces résultats, cette étude souligne la nécessité d'intégrer les ressources muséales dans les programmes de formation des enseignants.

Resumen

Los museos de artes visuales como entornos de aprendizaje en los programas de grado y postgrado de la Facultad de Educación de la Universidad Complutense de Madrid – Este artículo se centra en la necesidad de acercar el entorno museístico a los estudiantes de la Facultad de Educación de la Universidad Complutense de Madrid (UCM). La motivación para ello surge de la carencia observada en la formación artística de nuestros estudiantes, evidenciada por la falta de familiaridad con los recursos y oportunidades de aprendizaje que ofrecen los museos. Para abordar esta cuestión, se optó por un diseño metodológico mixto cuantitativo-cualitativo, centrado en los factores que definen la educación artística. La investigación se llevó a cabo con una cohorte poblacional de estudiantes de la UCM (N = 476), incluyendo futuros docentes, profesionales de la pedagogía y profesionales de la educación social. Los resultados confirman la hipótesis inicial, ya que el 82,2% de los estudiantes manifestó tener un conocimiento limitado sobre los museos y sus recursos. Además, el 48,3% de los participantes considera que su formación artística durante la enseñanza obligatoria ha sido inadecuada, y entre estos, el 78,6% afirma que su profesorado carece de los conocimientos necesarios. En el proyecto de innovación Laboratorio Pantono (PID) de la UCM, el 88,6% de los estudiantes de la Facultad de Educación consideran que los recursos educativos museísticos son relevantes para su formación y reconocen su utilidad en todas las etapas educativas. Esto se debe a que estos recursos facilitan la adquisición de aprendizajes relacionados con la didáctica y el currículo (63,3%), la recreación (92,99%), la expresión (63,30%) y los temas transversales (90,3%). A

partir de estos resultados, este estudio subraya la necesidad de integrar los recursos museísticos en los programas de formación del profesorado.

Introduction

Since the late twentieth century, the objectives and public engagement strategies of museums have undergone significant transformations, reflecting broader changes in their societal roles. Originally mere custodians of art and heritage, these spaces have become what James Clifford (1997) termed “contact zones”; places that spatially and temporally unite subjects previously separated by geographic and historical disjunctions. They prioritise interactive and improvisational dimensions, emphasising the construction of identity and reciprocal relationships. Accordingly, museums have gained an educational dimension, offering transformative educational experiences and serving as laboratories for developing critical skills and professional identity across various fields (Arbués and Naval 2014; Chisolm et al. 2020; Rymarczyk 2023).

Art education is crucial for developing creative and critical thinking skills, enhancing cultural awareness, mastering visual language, and conceiving original solutions that promote social justice, as noted by Marit Dewhurst (2014). Various scholars highlight the role of museums as allies and partners in promoting literacy (Seligmann 2014; Ramey-Gassert et al. 1994). Museums encourage student engagement with culture. It is therefore essential that future educators have a robust understanding of the role of art and museums within the educational realm (Guo 2021).

The integration of pedagogical approaches centred on aesthetics, art history and critical analysis has redefined this educational and pedagogical dimension as a fundamental ally of public education (Kindler 2015). Moreover, museums privilege both affective domains – feelings, interests, attitudes, emotions and values – and psychomotor ones, highlighting the value of creativity that emerges from deep observation of artworks (Hendra et al. 2019).

The “educational turn” in the arts, which has recognised the evolving role of museums, must not be overlooked (Rogoff 2011), particularly since museums and their agents have made it hegemonic. This approach has led to the incorporation of art-specific methodologies and knowledge into formal education, allowing for greater flexibility and openness to experimentation, as well as for critical collaboration between cultural and educational institutions.

These positive actions initially come with few references and little understanding of formal education, which gives rise to certain conflicts of interests and methodologies (Sánchez de Serdio 2021) between educational institutions and cultural institutions and between formal and non-formal education in the arts. Of particular relevance in this regard is teacher training – a point that Carla Padró (2010) raises when she proposes allowing teachers to organise museum visits according to their demands, without much intervention from art agents.

However, a lack of training in museum and visual arts education has fed regressive ideas about art and museums (García Cano 2021) and demotivated teachers to

approach museums, ultimately resulting in a loss of capacity to impact the exhibition context and its agents.

Some authors, such as Ricard Huerta (2010) and Paul Haidet et al. (2016), suggest that artistic training as part of mandatory education depends on the personal inclination and commitment of educators. Lack of access to quality artistic and cultural education, an essential right recognised by the United Nations under Article 27 of the *Universal Declaration of Human Rights* (UN 1948), can hinder the development of necessary skills such as creativity and critical artistic analysis, as well as cultural sensitivity (Gibson 2003; Winner et al. 2013; Bostan 2016). These skills converge in the key competency of cultural awareness and expression, which is a mandated part of the curriculum according to the Spanish law governing education (LOMLOE)¹ in alignment with the laws of the European Union (EU). This relates directly to cultural heritage (de la Torre 2013) as it is essential to the development of citizens aware of their cultural rights, including their right to participate in the construction of their own identity (Beirak 2022).

On the one hand, there is abundant literature recognising the pedagogical importance of art education and museums as spaces for non-formal artistic education and cross-disciplinary learning (Al-Radaideh 2012; Luna and Ibáñez-Etxeberria 2020) contrasted with the reality of a gap between museums and teachers and a lack of collaboration between cultural and educational institutions. Imanol Aguirre (2013) and Erhan Görmez (2020) note that many future educators have not personally experienced a museum – a point confirmed by a recent study at the Faculty of Education at the Complutense University of Madrid (UCM) (García Cano 2021, 2023).

However, authors such as Alan Marcus et al. (2012) have proposed other reasons for this gap, including barriers of cost and logistics that make it difficult for secondary school teachers to visit museums, while Ewa Piwowska et al. (2023) note factors such as a lack of offerings that teachers consider suitable for children and the difficulty of incorporating art education into the curriculum without adequate training. In Spain, Sofía de Juan (2019) addresses deficiencies in the training of active teachers and highlights teachers' resistance to implementing artistic methodologies and strategies in the school setting, aspects that became evident in a more recent investigation (García Cano et al. 2022) conducted at the Deslizar Laboratory, a project implemented by the Prado National Museum in Madrid, involving primary and secondary education teachers, artists, museum educators, and students from the Faculty of Education at UCM.

Those who complete mandatory secondary education in Spain and arrive as students at UCM's Faculty of Education exhibit deficiencies of artistic training (García Cano 2021, 2023). This contributes to a vicious cycle where university education seems unable to dismantle certain perceptions, especially ones related to contemporary art, of inaccessibility and a lack of merit and effort, or of unsuitability for

¹ For more information in English about the *Ley Orgánica de Modificación de la Ley Orgánica de Educación* (Organic Law Amending the Organic Law of Education; LOMLOE) which came into force in January 2021, visit <https://eurydice.eacea.ec.europa.eu/news/new-education-law-spain> [accessed 4 December 2024].

children, when it is precisely contemporary art that can best connect us to the problems of our time (Ching 2015) and help us imagine through estrangement and uncertainty alternatives for a better world (Zaaiman 2015).

Considering the modes of learning that both artistic practice and experiences produce, we find another contradiction, directly related to another significant paradigm shift, namely the “affective turn” (Clough and Halley 2007), which assumes emotion and experience as affects on the body and the affective body as a constructor of knowledge beyond the merely cognitive. Experiences of art, and especially contemporary art, which, as Nekane Aramburu (2020) points out, is built from horizontality, real-time collaboration and shared knowledge of the present, link us directly to our own experience. Following pedagogical models that emphasise individual subjectivity and activate the potential for agency (Matthewson-Mitchell 2014), Christine Castle (2006) proposes adapted and reflective pedagogical approaches.

Given that the benefits are so great yet deficiencies are still evident, it seems necessary to interact with museums and galleries in teacher training. Although positive steps have been taken in that direction, the problem continues to significantly affect teaching quality and student access to museums. It is also important to consider the value of digital interaction with museums (Wishart and Triggs 2010) within teacher training to understand the importance of platforms that generate structures, norms and practices that favour change and are able to generate the professional, institutional and community development conducive to supporting a culture of collaboration (Álvarez-Arregui et al. 2017).

The study we present here is part of a series of five Teaching Innovation Projects, which began in the 2018–2019 academic year, funded by the Complutense University of Madrid (UCM), although most of its findings are derived from the last of the projects, entitled “Museums and University III: The museum as a space for learning through visual arts for the Sustainable Development Goals (SDGs)” (2022–2023), which was implemented by the Faculty of Education of UCM in collaboration with the Salesian Centre for Higher Education in Humanities and Educational Sciences, Madrid (CES Don Bosco) (García Cano et al. 2023). Both institutions have proven their commitment to educational innovation and art education.

The main objective of this project was to investigate deficiencies in relation to art and museums in the training of teachers at the Faculty of Education in one of Spain’s most prestigious higher education institutions, and to identify approaches that may contribute to greater understanding of museums of visual and plastic arts as well as resources for autonomous learning. As part of this project, the researchers also developed a unique resource, called *Archivo Pantono*, which can be used to create a learning community.² The guiding idea that ran through this project was to awaken awareness of the potential of the museum as an educative space.

An initial survey was carried out, which provided valuable information about the main institutions of visual arts in Madrid and helped the students become more

² The *Archivo Pantono* provides a series of activity slides (in Spanish) for each of the (currently) 18 art museums and other cultural venues covered on its website. They are available at <http://educacionpantono.com/> [accessed 4 December 2024].

aware of their starting point. From there, students were required to make two to three visits to proposed museums, research their resources, and reflect through an open-ended questionnaire on the institution, the exhibition, and what they had learned through their visits. Occasionally, students were invited to participate in building the *Archivo Pantono* by contributing a small review to motivate peers. Concurrently, seminars, conferences and workshops were developed in the classroom to provide tools to approach the museum, art, and possible learning methodologies in these spaces, with an orientation towards sustainability and social engagement.

The project benefited from the close collaboration of museums, art rooms and art centres in Madrid with researchers and students, such as the Prado National Museum, the Young Art Room, La Sala Alcalá 31, Matadero Madrid and the Conde Duque Contemporary Creation Center. This ensured a rich diversity of perspectives and resources that allowed the students to address the topic from multiple angles. The students were free to choose which institutions to visit, provided that at least one was a contemporary art space.

Objectives and research questions

The main objective of this research was to provide evidence for the need for specific training in the knowledge of visual arts museums, their resources, and possibilities for meaningful learning in teacher education to acquire competence of cultural awareness and expression and to “ensure inclusive, equitable quality education and promote lifelong learning opportunities for all”, as mandated in the fourth Sustainable Development Goal (SDG 4) (UN 2015, online). The specific objectives of our research were as follows:

- (1) to identify students’ prior knowledge of visual arts museums;
- (2) to enumerate and categorise the educational resources that students identified in the museums; and
- (3) to define the contributions that knowledge of museums and their resources offer to teacher education.

The present research addresses the hypothesis that the incorporation of knowledge about visual arts museums and the use of their resources within teacher education provides significant learning opportunities for the acquisition of the key competence of cultural awareness and expression and contributes to enhanced professional capacity to ensure inclusive, equitable education and promote lifelong learning opportunities for all. The research questions (RQs) that guided this study were as follows:

- (RQ1) Do students have knowledge about museums in the Madrid area, their resources and educational programmes?

- (RQ2) Have students ever participated in an activity at a museum?
- (RQ3) Do students believe they received adequate education about visual arts and the exploration of cultural heritage during their school years?
- (RQ4) Following the experience, do participating students consider the museum to be a learning space and a useful educational resource linked to their future professional endeavours?

Materials and methods

Taking these questions into consideration, we opted for a mixed-methods research design, involving both quantitative and qualitative techniques. Our approach is cross-sectional, observational, descriptive-comparative, explanatory-predictive, relational and critically reflective (Alvira 2002; Cea D'Ancona 2012; Reidl 2012). The objective of the research was to describe the factors that contribute to artistic education in relation to the use of visual arts museums within a specific population cohort, namely trainee teachers, educators, and professionals in pedagogy and social education at UCM. Importantly, we do not aim to establish causal relationships between any of the variables studied in this research.

To address Objectives 1 and 2, as well as Research Questions RQ1, RQ2, and RQ3, an exploratory quantitative study (Hernández Sampieri et al. 2014) was conducted to determine prior knowledge. A qualitative study was employed to answer RQ4 and Objective 3. The critical phenomenological method was used to interpret the results and their potential implications for students' academic education. This method is based on suspending judgement regarding the existence of experiences that define lifestyles, allowing for the recovery of their pure significance through hypothetical questions based on real, possible, and feasible contexts (Guedes and Moreira 2009).

Research context and participants

The present study focuses on undergraduate, double-degree and postgraduate programmes at the Faculty of Education of UCM and CES Don Bosco. A total of 476 students participated in the study, representing the entire student teacher population at those institutions, since organised activities are mandatory for enrolled students (see Table 1).

Data collection instrument and data analysis

Students were given an initial questionnaire to help identify their prior experience of museums as educative spaces. They were also given access to a website called *Archivo Pantono* (see footnote no. 2), which contained direct links to museum

Table 1 Student profile

Degree programme	UCM (<i>n</i>)	Don Bosco (<i>n</i>)	Combined number of students	Academic year
Bachelor's degree in Primary Education and Pedagogy	148		148	
Double degree in Early Childhood Education and Primary Education	31		31	2022–2023
Bachelor's degree in Social Education	24		24	2022–2023
Bachelor's degree in Pedagogy	34	45	79	2021–2023
Bachelor's degree in Primary Education	49	49	49	2022–2023
Bachelor's degree in Early Childhood Education	31	88	119	2022–2023
Master's degree in Teacher Training in Visual Arts	26		26	
Total number of students (<i>N</i>)			476	

websites. This allowed them to explore the major institutions in the Madrid area, their exhibition offerings and other available resources.

Throughout the semester, students were required to visit three museums of their choice. At least one of these visits had to involve a participatory activity, workshop or guided tour that facilitated both an understanding of the exhibition and observation of the methodology used. To ensure broad access to these experiences, the project team developed a specific workshop through the Pantono Laboratory of the Educación Pantono collective.³ The workshop was conducted during the exhibitions at the Sala de Bóvedas of the Conde Duque Contemporary Culture Center. After each experience, students submitted a reflection in response to a series of key questions. Table 2 shows the sequence of phases, detailing the activities performed, their intended purposes, and the techniques used.

For the quantitative analysis, an ad-hoc questionnaire was designed. This included multiple-choice questions with single answers and dichotomous questions. Comprising 18 questions, it was validated by expert faculty members from all participating groups after ensuring it was comprehensible and aligned with the research objectives. It was categorised into three study areas along with questions on general data. Table 3 provides a detailed description of the specific objectives, categories and questions applied to the students.

³ As explained on UCM's dedicated webpage, Educación Pantono "is a multidisciplinary, horizontal and open collective, formed by art students and teachers from the Faculty of Education of the Complutense University of Madrid. It works and researches to generate links with the rest of the university community – especially with Fine Arts – and with cultural institutions in Madrid. The role of both as pedagogical agents makes their connection necessary, especially in their view of the present and their desires for the future. To this end, Pantono Education develops experimental proposals for action–participation–reflection that affect educational and cultural institutions" (<https://www.ucm.es/laboratoriopantono/que-es-laboratorio-pantono> [accessed 4 December 2024]).

Table 2 Framework for information collection and corresponding analysis

Stage	Activity	Objective	Method	Context
(1) Initial immersion and exploration	Initial questionnaire	Identify prior knowledge of museums and visual arts	Distribution of online questionnaire	Lifelong learning
(2) Museum experiences	Museum visit	Encourage experiential learning and artistic appreciation	Selection and scheduling of museum visits	Experiential learning
(3) Reflection and analysis	Specific workshop visit at Pantono Lab in Conde Duque	Participation in interactive activities at museums	Participation in specific workshop at Conde Duque	Active learning
	Post-visit reflection	Analyse and reflect on learning experiences	Completion of post-visit reflective task	Learning through practice
(4) Integration and application	Quantitative analysis questionnaire	Assess impact of visits and activities on perception and knowledge	Distribution of ad-hoc questionnaire	Engaged learning
	Presentation of learning	Share learning and reflections generated	Preparation of presentation on experiences through written reflection	Lifelong learning
	Evaluation and feedback	Evaluate learning process and obtain feedback	Feedback session with teachers and students	Engaged learning

Table 3 Relationship between specific objectives, categories and questions in the student questionnaire

Specific objectives	Categories	Questions
Specific objective (1): identify students' prior knowledge of visual arts museums	Visit (prior knowledge of museums)	Do you think a visual arts museum can be a space for educational experiences on any subject? Have you ever visited a museum?
Specific objective (2): list and categorise the educational resources identified by students in museums and relate them to their reality	Participation (in museum activities)	Have you ever participated in an activity at museums?
	Identification (perception of museums as an educational resource)	Do you think the educational resources of museums, art rooms, and art centres are interesting for teacher training, pedagogy, and non-formal education? During your compulsory education, do you consider that your training in visual arts was relevant to you?

Data were collected using a questionnaire developed using Google Forms, chosen for its accessibility in collecting participants' responses. After the data collection period ended, responses were downloaded into an Excel file, which facilitated the organisation and preliminary analysis of the data.

The qualitative questionnaire gathered students' reflections on their visits to the exhibition rooms using a detailed technical form specifically designed for this study. This included 12 questions designed to explore various aspects of the students' museum experience. They were asked to indicate the title and place of the selected exhibition, the reason for their choice, their general impressions (what attracted them, what they disliked, or what they were indifferent to), as well as a connotative and denotative analysis of a work of their choice. Furthermore, they were asked about questions, doubts and emotions that arose during their tour, the resources used to resolve them, and their perception of the professional utility of the visit. They were also asked to evaluate the potential of the museum's educational resources from their perspective as students and future professionals, to describe the methodology and learning experience in specific activities (workshops, guided or dialogue visits), and to reflect on how they would share this experience with friends or family. This data collection method was chosen for its ability to capture the individual experiences and perceptions of the students, thus providing a rich source of qualitative information for analysis.

The qualitative analysis was conducted using Atlas.ti 23 software. It began with an open coding phase to assess each individual opinion, allowing the creation of preliminary categories capturing their essential dimensions. Subsequently, through axial coding, key connections were established to answer questions of when, where and why, thus facilitating the generation of additional categories. This process is supported by the work of Jane Scales (2013) on the use of Atlas.ti for the qualitative analysis of student tasks. Additionally, Jakub Niedbalski and Izabela Ślęzak (2017) provide insights into the use of Atlas.ti in research that relies on grounded theory methodology, highlighting the use of technical procedures and analytical exploration. The integration of codes and the construction of networks between concepts and themes facilitate the identification of patterns in student opinions of the activities performed, demonstrating the versatility and depth of analysis that Atlas.ti 23 offers for qualitative studies (Scales 2013; Niedbalski and Ślęzak 2017).

Subsequently, the categories and codes with the highest grounding and density in the responses were identified. Grounding refers to the frequencies of the basic codes, while density refers to the number of documents in which each axial code of the second-level categories is found. To obtain the final book of axial and basic codes for the research, only those codes that contributed a minimum absolute frequency of 4 were included (see Table 4).

Results

Based on the collected data, we present the most prominent findings of the study below. Descriptive statistics were employed to define the characteristics of the sample in the quantitative aspect.

Table 4 Codebook resulting from the codification process

Objectives	Level I code (variable)	Level II code (frequencies)	Basic code (rooting)
Specific objective (3): define the contributions that knowledge of museums and their resources offer to teacher education	1. Learning	1.1 Usefulness of the visit	Art appreciation (22)
			Interest (8)
			Educational value of museums (6)
	2. Educational resource	2.1 Meaning	Learning (4)
			Personal enrichment (16)
			Emotional (5)
	3. Professional linkage	3.1 Meaningful learning	Education (19)
			Art and culture (7)
			Museums (7)
	3.2 Recommended experience	3.2 Recommended experience	Creativity (6)
			Interest (12)
Interpretation (6)			
Reflection (5)			
Education (4)			
Positive experience (4)			
Assessment of contemporary art (4)			
Recommendation (28)			
Art (22)			
3.2 Recommended experience	3.2 Recommended experience	Education (21)	
		Learning (14)	
		Reflection (7)	
			Professional Interest (5)

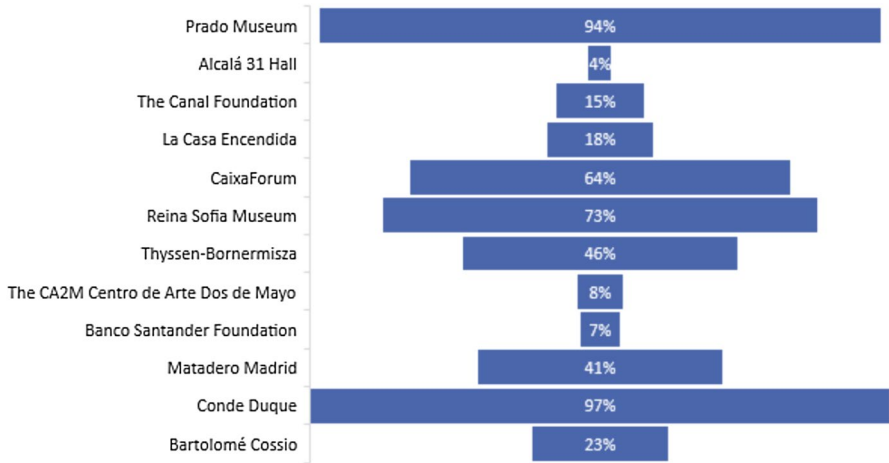


Figure 1 Museums visited by students

Table 5 Students’ responses on visual arts museums as a space for educational experiences

Question on	Yes	No	Perhaps
Educational experience	79.4%	0.5%	19.9%

Quantitative analysis

(RQ1) Do students have knowledge about museums in the Madrid area, their resources and educational programmes?

To determine which museums the students were familiar with, they were shown a list of 15 cultural institutions. Figure 1 indicates that Conde Duque was the museum best known to the students (due to the participation of groups in previous years in activities offered through the *Archivo Pantono* educational resource, which took place in this space), followed by the Museo del Prado, Reina Sofía, and Caixa Forum. It is also worth noting that the rest of the museums did not reach the 50 per cent visitation rate by the students, including the Bartolomé Cossio museum located within the Faculty of Education at UCM.

Regarding the students’ knowledge of the educational resources and activities offered by museums, a dichotomous question revealed that 58.8% of respondents had some knowledge of these resources, while the remaining 41.2% were unfamiliar with them. Concerning the perception of the museum as a useful tool, 79.4% of the respondents answered affirmatively (see Table 5).

(RQ2) Have students ever participated in an activity at a museum?

In the variable of activities conducted within the museum space, the following multiple-choice question was presented: “Have you engaged in any activities in

museums?” The activity scoring the highest percentage was “Guided tours” (54.7%), which was nearly five times higher than the next most commonly undertaken activity, workshops (11.4%) (see Table 6). The distinction between a guided tour and a dialogue-based visit lies in the inclusion of public participation, where a collective discourse is fostered through conversation, leading to co-created knowledge.

In Table 7, we can see that 88.6% of the participants considered the educational resources offered by museums to be relevant to their education. This points to a positive valuation of museums as enriching spaces for formal education at all stages, facilitating the acquisition of didactic, playful, expressive and transversal learning.

(RQ3) Do students believe they received adequate education about visual arts and the exploration of cultural heritage during their school years?

Only 44.3% claimed that their education in visual arts had been relevant, while the rest clearly say no or only a little (see Table 8). Considering that the survey participants were students of a Master’s in Teaching programme with a specialisation in Plastic Arts, most of whom came from Fine Arts and Design backgrounds, it seems pertinent to consider that there is a perceived deficiency in previous artistic training.

Additionally, the research delved into students’ level of knowledge regarding the educational offerings available for training in visual arts, without specifying whether the context is formal or informal. The analysis revealed that a majority, 96.4%, was unaware of the educational offerings. In contrast, the small remaining percentage, 3.6% of respondents who were informed about educational opportunities in visual arts, tended to primarily identify formal educational institutions as the main source of learning. However, it is notable that some of them also recognised the existence of non-formal educational resources. Of these, frequent mentions of the “culture pass”, an initiative that allows free access to museums, stands out, suggesting an appreciation of museums not only as entertainment spaces but also as environments for learning and personal development.

Table 6 Students’ responses on participation in activities at museums

Question on	None	Guided tours	Dialogue visit	Workshop	Guided tours only	All
Activities conducted	7.8%	39.1%	2.4%	11.4%	15.6%	7.1%

Table 7 Students’ responses on “educational resources”

Question on	No	Yes	Perhaps
Educational resources	0.5%	88.6%	10.9%

Table 8 Students’ views on the relevance of their training in visual arts during compulsory education

Question on	No	Yes	A little
Compulsory education	19.2%	44.3%	36.5%

All these responses highlight the importance of considering the value that visual arts hold within the educational curriculum and their potential to enrich student learning and development. To illustrate these findings, we have summarised the identified educational offerings in Table 9, evidencing not only the respondents' familiarity with the educational offerings in visual arts but also the possible areas of interest and specialisation within this field.

Regarding satisfaction with the education received at school in relation to visual arts and approach to cultural heritage, the results show that 48.3% considered it inadequate, 24.4% indicated that it was adequate, while 27.3% were unsure (see Table 10). This scenario of moderate satisfaction could be related to the low level of awareness about the educational offerings in visual arts observed previously.

Delving deeper into the 48.3% of students who were dissatisfied with the training received in visual arts, we observed that 78.6% of them considered the teachers who taught the subjects to have not been well trained, 18.1% indicated that the social context was not favourable, and 3.3% attributed their dissatisfaction with the training received to a lack of family support (see Table 11).

In the dimension of the function of art, we gathered the students' opinions regarding the usefulness of art and marked all statements with which they agree.

Table 9 Educational offerings identified by 3.6% of respondents

Educational offering	Percentage (%)
Arts baccalaureate	0.8%
Non-regulated training	0.8%
Bachelor's degree in Visual Arts and Dance	0.6%
Private university	0.2%
TAI Arts	0.2%
Bachelor's degree in Visual Arts and Dance	0.8%
Lectures at universities	0.2%

Table 10 Results for the variable "Received Training". Do you believe that you have received adequate training at school in relation to visual arts cultural heritage?

Variable	No	Yes	Perhaps
Received training	48.3%	24.4%	27.3%

Table 11 Results for the variable "Received Training". If your previous response is "No, I have not received adequate training", to which of these reasons do you believe it is due?

Variable	Unfavourable social context	Lack of family support	Lack of teacher training
Received training	18.1%	3.3%	78.6%

Qualitative analysis

For the qualitative analysis, responses and reflections were collected from those who visited any exhibition space during the academic years 2021–2023. A total of 241 opinions (across all involved groups) were gathered for the variables of learning, educational resource, and professional linkage. In our presentation of the students' reflections below, the first figure in the code indicates the document number, and the numbers that follow represent the specific quote within that document. For instance, [2:27] signifies document 2 and quote no. 27 within that document. In line with the codebook (see Table 4), the documents considered include student opinions, organised into three categories: learning (document 1), educational resource (document 2), and professional linkage (document 3).

(RQ4) Following the experience, do participating students consider the museum to be a learning space and a useful educational resource that is linked to their future professional endeavours?

The sentiment analysis conducted on the 241 collected opinions using the Atlas.ti tool reveals considerable diversity in the perceptions of students who visited exhibition halls during the academic years 2021–2023. According to this analysis, a significant 78% of the responses from the students expressed a positive sentiment towards the experience. This analysis takes into account that over 50% of the students had attended the exhibitions independently, without any preparatory activities or guides that could potentially have enriched their experience and understanding of the displayed works. On the other hand, 17.4% of the opinions reflected a negative evaluation, and 14.1% were identified as neutral, indicating that although the majority of experiences were positive, there is room for improvement.

The sentiments (78% positive, 17.4% negative and 14.1% neutral) indicate the existence of varied opinions within the same unit of analysis, as reflected in the percentages which do not add up to 100. The most frequent words the students used in their responses were related to learning, the museum, artwork as a resource, teacher training, experience, the opportunity to learn, formal and informal education, and the student as an active subject, all of them related to the museum as a meaningful environment for inclusive, equitable quality education.

Educational resources – The frequencies obtained show that the students defined educational resources as tools that link art to education and that they considered them useful for developing personalised pedagogical activities in the classroom, both currently, in relation to the contents of the didactics of plastic and visual expression, and in the future, to work transversally with different subjects such as history, geometry, oral expression, etc., and to improve the so-called soft skills that facilitate interpersonal relationships and are especially important in the practice of teaching. They also considered them as a means of bringing art to an uninitiated audience and transmitting human values through suitable materials and techniques for educating, thus contributing to achieving inclusive, equitable quality education. Furthermore, they demonstrated an understanding that these resources can be used to transmit artistic knowledge in a dynamic and creative way, as well as to explore

and experiment with the specific space, not only in the museum but also outside of it, in the sense that “it allows a different understanding of spaces and, consequently, organising the classroom in a more visual and harmonious way” [2:27].⁴

Usefulness of the educational resource – The emphasis here was on comprehending artworks using various tools, aiming to shift attitudes by “helping to focus their attention on the artwork or exhibition” [3:16], providing “educational methods” [3:24], and fostering “critical thinking” [3:27]. Moreover, the students explained how, through their participation in the project, they had learned “to make the most of the museum, in relation to the contents of the works, the space, and even the museographic discourse” [3:51], as it “allows learning in a more autonomous way, issues related to artistic expression and applying such learnings to other subjects” [3:89].

On the other hand, the students considered that the education received in museums was related to

“humanistic learnings linked to emotional intelligence, in such a way that the museum is a suitable learning environment to address these knowledge areas transversally and experientially, especially through participation in workshops and dialogic visits” [3:75].

Creativity is further enhanced by resources that facilitate deep exploration, prompting actions on pressing topics like the environment [1:43] and stimulating interpretation of visual codes to bolster imagination [1:79].

Meaningful learning for professional linkage – Students highlight that museum exhibitions provide an opportunity to investigate and discover new concepts [1:47], which can be beneficial for their professional future. They acquire tools not typically available in classroom settings, such as how to use space to convey messages, improve visual language and interpret images [1:80]. They also learn to analyse the connections between different curricular aspects of early childhood and primary education through art [1:51], and address transversal aspects of the curriculum, particularly those related to emotional intelligence through museographic discourse and contemporary art [1:8].

Additionally, motivation and interest can be enhanced through museum visits [1:80]. The organisation of museums can influence the visitor’s experience, making it more surprising and engaging [1:92]. The role of the guide is crucial for deeper learning and obtaining information beyond what is observable, making the experience more impactful. For example, one student mentioned, “I have thought that it would be interesting to present the concepts and the relationships between them, following the format that museum guides have” [1:7], because “they are tremendously visual and allow establishing spatial relationships between ideas and images” [1:83].

In general, museum visits can be very interesting and moving, positively impacting personal and professional development. Students noted that both workshops and dialogic visits are powerful tools they plan to use as future teachers [1:10], not only

⁴ The research was conducted in Spanish. Participants responses have been translated into English for the purposes of this article.

as external resources but also as models to structure didactic units. For instance, “while one group of students designs a workshop, another enjoys it and vice versa” [1:31], considering it an experiential and participative format that allows for relaxed, in-depth learning [1:53].

Students also highlighted the importance of detailed interpretation. For instance, they learned how the details can change the meaning of the work [1:7] and appreciated the opportunity to stop and reflect on different figures or representations [1:50]. They learned to analyse a work by focusing on its perceptible characteristics, understanding what it says to them, and what the artist might have intended to convey [1:20]. They realised the value of guides in helping them to interpret works without seeking immediate meaning, thus enhancing their memory and understanding [1:31].

Students reflected that this approach could be used in visits for children, adapting themes and questions to their age [2:47]. They valued art as a tool for critical thinking and addressing current issues, noting the difficulty of acquiring these skills in other contexts, as “an image is worth a thousand words” [2:56]. Art allows for a deep connection with the artist’s feelings, which is important for early childhood and primary education in understanding the impact of emotions on behaviour. The artists’ lives serve as examples of motivation and resilience, which students can use in their teaching [2:95].

Educationally, students considered museum visits as effective resources for explaining history and art [2:93]. They expressed their belief that constant contact with art is essential for educators, making museum visits a crucial part of the educational curriculum [2:95]. The museographic discourse allows working on humanistic content, inviting reflection on aspects linked to emotional intelligence and current issues [2:102]. From a didactic perspective, the dynamic and dialogic visit is enriching as it promotes critical thinking, reflection, creativity and emotional expression [2:103].

Students conveyed the positivity of their experiences through identification with the artists’ feelings and reflection on their future roles as teachers. They saw art and museums as resources that allow for critical reflection, interior work, learning about space and organising content visually [2:56, 2:74, 2:1].

Experiencing guidance – Exhibition spaces offer children distinctive, creative learning avenues. One student noted that museums are key didactic environments for imaginative learning [2:1]. Teachers must continually develop their skills to shape pupils’ perspectives and stimulate imagination [2:14]. Students highlighted the role of museum visits in expanding art understanding, inspiring classroom activities [2:3], broadening mindsets [2:26], and emphasising the essential role of art in education [2:59, 2:95].

Educationally, museum exhibits offer deeper insights beyond the artist’s intention [1:41]. They are valuable for children, with “... good works suitable for the youngest” [2:9], enriching education through dynamic interactions [2:103]. Guided exploration enhances observation skills and helps to build a bridge for students to culture and art [2:11]. Guided reflection enables students to contemplate diverse figures, and they perceive art as an avenue for imaginative freedom [1:50, 2:56]. The curator’s role in shaping viewer interpretation was also recognised [1:55]. Professionally,

the students saw art as a vital tool for their future teaching practice, emphasising its utility for introducing contemporary art perspectives in education [2:45, 1:34]. These visits inspired the students and demonstrated the transformative power of art and museums in educational contexts.

Discussion

This article, anchored at the confluence of critical phenomenology (Lefevre and Cavalcanti 2014) and new museology, highlights the value of museums as critical sites for both formal and informal learning. This understanding has been fuelled by a paradigm shift that reconceptualises museums not merely as repositories of art and heritage, but as vibrant laboratories for cultivating critical skills and fostering an education that surpasses traditional pedagogical boundaries (Arbués and Naval 2014; Chisolm et al. 2020; Rymarczyk 2023). As Irit Rogoff (2011) observes, the educational efficacy of arts-based pedagogy in elucidating the connections and impacts of specific groups has redefined the social role of the museum as a space that is open and in continuous dialogue with educational institutions.

Despite the widely acknowledged educational value of museums and their potential as key allies in public education, a notable disconnect remains between theoretical frameworks and practical application in their effective integration within educational settings, particularly in the training of visual arts teachers. Our article addresses this gap by underscoring the necessity for targeted training that equips future educators with the skills to utilise museums as educational resources (Gómez 2020; Marcus et al. 2012).

Challenging the stereotype of the ineffectiveness of art education for teachers, this research proposes the concept of an “expanded classroom” within the museum space itself. This approach facilitates the interdisciplinary acquisition of curricular content from various subjects, as evidenced by the findings of Vivek Venkatesh et al. (2023). In the current post-pandemic context (WHO 2022), these enriched environments contribute to enhancing emotional well-being, as indicated by Rarita Zbranca et al. (2022) and the World Health Organization (WHO) Regional Office for Europe (2023). It is striking that students of education in Madrid do not frequently visit museums (Huerta 2010) and have barely participated in activities beyond the guided tours organised by the school, the institute, or their own families (García Cano 2021). This issue is related to the imaginaries of art and the museum (García Cano et al. 2022) and the lack of general training of teachers in relation to this (de Juan 2019). This is why artistic creations, especially contemporary art, are not frequently used as educational resources, and are often considered inaccessible and reserved for a specialised audience that can understand them as artefacts resulting from participation, subjectivity, and the creation of meaning.

Another relevant finding from the research that should be considered in the design of curricula for university degree programmes in education is the effectiveness of the intervention offered by the innovation project (Proyecto de Innovación; PID) framing this study in collaboration with Laboratorio Pantono. After being trained through the mediation actions and participating in various museum activities, 88.6%

of the students considered the educational resources offered by museums to be relevant to their education, not only from a purely artistic perspective but also in a cross-disciplinary manner, linked to other knowledge or disciplinary areas such as values education, emotional intelligence, and creativity applied to conflict resolution (García Cano et al. 2022). This shows, as pointed out by de Juan (2019), that when the museum is experienced as an environment of learning, production, expression and co-creation of thought, it becomes an extended classroom.

This latter aspect highlights the prior lack of knowledge among students in the Faculty of Education at UCM and the need to break the conceptual circle that has traditionally associated art with the genius of a few individuals rather than recognising its potential for advocacy, community engagement, expression, playfulness, symbolism and meaning beyond technical mastery (Eisner 2004). It is significant that after the experience, the students were able to identify the usefulness of art and associate the learning that occurs through its practice and the mediation between art and education with didactic aspects (63.3%), playfulness (92.99%), expression (63.30%), and cross-disciplinary elements (90.30%). It appears that when art is taught through art itself, the artistic becomes a learning-by-doing process, rather than learning aimed at passing a particular exam (Martínez-Vérez et al. 2020).

Regarding the type of museum institutions with which students are familiar, the majority belong to the realm of contemporary art. As María Galeano (2021) states, we all seek to understand or be understood by others who share our present reality. Regarding the type of art institutions with which students are familiar, classical institutions such as the Prado Museum, those that hold general exhibitions such as CaixaForum, and the contemporary art museum Reina Sofia are predominant. However, this does not mean that they visited these institutions as part of this study. In relation to the other institutions mentioned, the majority are spaces dedicated to contemporary art. Some of them, such as La Casa Encendida, go beyond being mere exhibition spaces. In this regard, Matadero Madrid and Centro de Cultura Contemporánea Conde Duque are exceptions. The former has gained attention in recent years for its immersive exhibitions that are highly appealing to the general public, while the latter is a proposal developed from previous innovation projects. It highlights the advantages of continuity in artistic education offered by the Early Childhood Education degree, where the range of art-related subjects throughout the degree is greater compared to other degrees where only one art-related subject is taken over the course of four years.

The fact that 48.3% of the students participating in our study considered their artistic education during their school years and their exposure to cultural heritage to be inadequate suggests that the context in which they were being asked this question itself raised their awareness. Furthermore, the fact that 78.6% of dissatisfied students believed that the teachers who taught these subjects were not well trained reinforces the analysis of the theoretical framework and the findings of de Juan's study (2019) of teaching staff. This lack of training makes it harder for students to enjoy artistic practices, creativity and free expression (Blanco and Cidrás 2019). Additionally, as also noted by de Juan (2019), there is a limited connection between the curricular content of visual and plastic art education and the current issues faced by postmodern society.

Conclusions

The research presented here demonstrates the critical importance of integrating the knowledge and resources of visual arts museums into teacher education to achieve the Sustainable Development Goals, particularly SDG 4, which advocates for “inclusive, equitable quality education” (UN 2015). By exploring the relationship between art education in museums and university-level teacher training, this study highlights how the lack of specific training in visual arts significantly limits the ability of future teachers to foster cultural awareness and expression in their students.

The research identifies a disconnect between the training received by future educators and the competency in cultural awareness and expression required to promote quality education. This is largely due to teacher training that has traditionally prioritised technical aspects of art over the broader, interactive and reflective educational experiences that museums can offer. The experience provided by the Pantono Education project reveals that cultural mediation in museums acts as a transformative agent, capable of expanding perceptions of art and its applicability to education beyond technique and imitation, towards the exploration of cross-cutting themes and the development of social and emotional skills.

The findings indicate that participation in cultural mediation experiences in museums not only enhances knowledge of the available educational resources but also promotes a deeper understanding of the utility of art in education. Participating students recognise the value in museum resources, not just from an artistic perspective but also in terms of their capacity to enrich the teaching of curricular content, effectively organise classroom space and foster innovative learning dynamics.

The identification of significant learning outcomes by the students, ranging from the conceptual to the methodological, underscores the effectiveness of integrating museums into teacher training. This approach promotes education that is relevant, contextualised, and capable of adapting to the changing needs of society, aligning with the principles of SDG 4. The project experience showed that by deconstructing preconceptions about art and its teaching, a broad field for pedagogical innovation could be opened up, supporting the development of more inclusive, equitable quality education.

This article highlights the urgent need to review and expand teacher training curricula to include specific training in the knowledge and use of museums and their resources. Proposals include creating curricula that explicitly incorporate visits to and studies of museums, offer specialised modules or workshops in cultural mediation, establish strategic partnerships between universities, education faculties and museums to develop joint educational programmes, research projects and professional practices. Doing so will not only enrich teacher training but will also help achieve the Sustainable Development Goals, preparing students to face the challenges of a globalised and constantly changing world.

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that prioritise integrity, confidentiality and respect for all participants and stakeholders. Specifically, it followed the American Educational Research Association (AERA 2011) standards and the recommendations of the British Educational Research Association (BERA 2018). To this end, a protocol of good practice was adopted in accordance with the Declaration of Helsinki (WMA 2013). In addition, this study has been examined by the Ethics Committees of the University of Valladolid, obtaining, at the CEIm ÁREA DE SALUD VALLADOLID ESTE meeting of 23 November 2023, the favourable opinion of the aforementioned committee: PI 23-3402NOHCUV.

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Marta García Cano holds a PhD with in Fine Arts from the Universidad Complutense de Madrid (UCM) and is a Professor of the Department of Didactics of Languages, Arts and Physical Education, where she teaches Pedagogy and Primary Education. She has collaborated in the Master of Arts Education in social and cultural entities at UCM. She is a founding partner of the collective Arte + Educación Pedagogías Invisibles and was a member of the Education Group of Matadero Madrid until December 2018. She has participated in various exhibitions as an artist and curator, addressing the theme of education and

pedagogy through an artistic format. Since 2013 she has participated in the design and implementation of educational and mediation programmes in institutions such as Fundación Banco Santander, Fundación Barrié, Sala de Arte Alcalá 31, Tabacalera Madrid, Museo Picasso de Eugenio Arias, Centro de Arte de Alcobendas, Area Sociocultural de la Comunidad de Madrid, and Plena Inclusión.

Paula Gil-Ruiz holds a PhD in Audiovisual Communication from UCM. She has bachelor's degrees in Humanities from the Open University of Catalonia and in Fine Arts from UCM. She completed a master's degree in teacher training at UCM with a specialization in Visual Arts. She has taught on bachelor's degree programmes in Social Education, Pedagogy, Early Childhood Education, and Primary Education at CES Don Bosco. She also teaches in the bachelor's degree programme in Higher Artistic Design at the European Institute of Design (IED) in Madrid. Her main research interests are audiovisual communication, sustainability, educational technology, Gen AI, the didactics of visual arts, inclusive education and creativity. She is a member of national research groups such as "Museums and University (I, II, III). Collaborative online resources and strategies for arts education in teacher training programmes for early childhood education, primary education, pedagogy, social education, and teacher training master's programmes" and "Literary and artistic representations of urban space". She has collaborated on the "International Transdisciplinary Network for Education and Research in Food Sovereignty. Dialogues for Cooperation between University and Community" and on innovation projects on Service Learning, such as the ApS Project "Inclusive Forest Recovery in the Surroundings of the Faculty of Education" at UCM.

Victoria Martínez-Vérez holds a PhD in Sociology from the University of Coruña and a PhD in Fine Arts from the Complutense University of Madrid (UCM). Additionally, she earned a Diploma in Social Work and Sociology from the Universities of Santiago de Compostela and Pontificia de Salamanca. She is a member of the editorial team of *Encuentros. Journal of human sciences, social theory and critical thinking*. She is a Professor at the Department of Musical, Plastic and Corporal Expression of the University of Valladolid and a PhD student at the Faculty of Fine Arts, Department of Sculpture and Artistic Education, Faculty of Fine Arts, Complutense University of Madrid (UCM).

Authors and Affiliations

Marta García Cano¹  · Paula Gil-Ruiz²  · Victoria Martínez-Vérez³ 

✉ Victoria Martínez-Vérez
vita.martinez@uva.es

Marta García Cano
martag02@pdi.ucm.es

Paula Gil-Ruiz
pgil@cesdonbosco.com

¹ Faculty of Education, Universidad Complutense de Madrid (UCM), Madrid, Spain

² Universidad CES Don Bosco, Madrid, Spain

³ Faculty of Education, Universidad de Valladolid (UVA), Palencia, Spain