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Article

Accessibility as a Shared Cultural Responsibility: The *Entre Luces* Project at the Pablo Gargallo Museum

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Abstract

In the context of the evolving role of museums as social agents, the *Entre Luces* project, developed at the Pablo Gargallo Museum in Zaragoza, stands out as a notable example of accessibility conceived as a shared cultural responsibility. This study investigates the co-design of a multisensory space within a listed historic building, aimed at fostering the inclusion of people with disabilities. Adopting a qualitative and participatory research approach inspired by bottom-up methodologies, the study combines document analysis, participant observation, and semi-structured interviews with museum professionals, technicians, educators, and users. Central to the process was the active involvement of individuals with disabilities, who were engaged not merely as beneficiaries but as co-authors of the design process. The findings highlight a significant transformation in museum practices and the implementation of inclusive educational pathways, enabled also through collaboration with vocational craft students. Despite operating on a small to medium scale, the museum has developed strategic indicators to assess the social and cultural impact of the project. *Entre Luces* is proposed as a transferable model for cultural institutions seeking to embed inclusive design within their institutional identity.

Keywords: cultural heritage; accessibility; education; cultural equity; co-design; social inclusion; institutional responsibility

1. Introduction

In the contemporary context, museums are increasingly configured as multifunctional institutions designed to respond to a wide range of cultural, educational and social needs. In addition to the historical functions of preservation, research and education, a vision of the museum as an active social actor in promoting inclusion and accessibility has emerged, contributing to community cohesion and equal access to culture [1,2].

This development reflects the transition from the medical model to the social model of disability, in which the focus shifts from individual pathology to environmental and cultural barriers to participation [1]. In this framework, disability is recognised as a social and relational construct, and accessibility is no longer an exceptional measure but a fundamental cultural right [3].

The way in which the social function is implemented varies greatly in different national contexts. In the Nordic countries, for example, models based on direct community participation are favoured, as in the case of the Rijksmuseum and its Accessibility Without Limits project [4], while in other contexts, such as the United States, centralised regulatory models prevail, as in the case of the Americans with Disabilities Act (ADA). With the Real Decreto Legislativo 1/2013, Spain is attempting

a synthesis between regulatory approaches and community initiatives. However, as of 2025, only three museums in Spain have obtained the Universal Accessibility certification awarded by AENOR [5], based on the UNE 170001 standard, which includes DALCO criteria (mobility, apprehension, location, and communication). This persistent scarcity of certified institutions highlights the gap between official commitments to accessibility and their practical implementation.

As Grey and McCall [1] state, the social function of museums cannot be limited to programmatic statements, but must be translated into concrete, participatory and sustainable practises capable of activating new audiences and removing material, cognitive and symbolic barriers. In this sense, the accessibility of museums is a transversal dimension of cultural action that encompasses architecture, communication, pedagogy, governance and technology [3,6].

The *Entre Luces* project developed at the Pablo Gargallo Museum [7] is a typical example of this integrated perspective. The project, launched in 2020 in the seventeenth-century Palace of the Counts of Argillo in Zaragoza—designated as a *Bien de Interés Cultural* (a protected cultural heritage site under Spanish law)—has successfully combined regulatory rigour, design innovation, and collaborative co-creation, becoming an exemplary case of inclusive design. As Kuryłowicz [8] emphasises, the accessibility of museums in historical contexts involves a complex dialectic between the protection of cultural heritage and the adaptation of space, where the balance between architectural constraints and cultural rights is crucial.

The forms that accessibility takes depend on a variety of factors: from the spatial configuration of the museum to the degree of involvement of the target groups, from the available resources to the institutional vision, from the local legal context to the educational and social objectives. Within this framework, the museum asserts itself as an agent of social inclusion, capable of promoting processes of active participation and cultural recognition for historically marginalised subjects.

The experience of *Entre Luces* shows that accessibility cannot be understood as a technical fulfilment or an afterthought, but as a continuous process of transformation based on cross-sectoral collaboration, the centrality of sensory experience and listening to communities. In this sense, it radically questions the role and responsibility of cultural institutions in the 21st century.

While the inclusive function of museums is increasingly addressed in both academic literature and institutional discourse, many studies still adopt a normative or policy-driven perspective, often neglecting the practical processes through which accessibility is implemented, negotiated, and sustained within heritage institutions. Furthermore, there is a lack of in-depth case studies focused on small to medium-sized museums located in architecturally protected buildings, where the tension between conservation and inclusion becomes particularly salient.

This study aims to contribute to the growing body of literature on participatory accessibility by analysing the *Entre Luces* project as an example of inclusive co-design in a heritage context. The research explores how accessibility is not only achieved through technical adaptations, but co-produced through collaborative, sensory, and pedagogical practices involving users with disabilities as co-creators.

The theoretical approach adopted draws on the social model of disability, inclusive museum studies, and Universal Design for Learning, framing accessibility as a cultural right and a shared institutional responsibility. The study addresses a key gap in the literature by documenting how these frameworks are translated into practice through localised, iterative and context-sensitive processes of transformation.

2. Materials and Methods

This study is based on a qualitative and descriptive analysis of the *Entre Luces* project developed at the Pablo Gargallo Museum in Zaragoza. The methodological approach adopted is grounded in the triangulation of three primary qualitative tools: document analysis, participant observation, and semi-structured interviews. This triangulation was strategically employed to ensure an in-depth and multi-perspective understanding of the project, combining institutional, experiential, and interpretive dimensions. Each method contributed uniquely to capturing the complexity of inclusive

practices: documents offered technical and strategic insights; observation allowed direct engagement with user interaction and educational activities; interviews revealed the motivations, reflections, and critical feedback of stakeholders.

The data used were collected through this triangulated approach, involving museum staff, accessibility experts, representatives of social organisations, and people with disabilities.

The document analysis included official sources related to the mission and vision of Zaragoza's municipal museums, project documents, activity reports and museum communication materials. Several internal documents, including the Informe de proyecto Entre Luces (2020), were made available by the project coordinators for research purposes. These documents are not publicly accessible but were used with permission.

Of particular importance were materials related to the design and implementation of the "Entre Luces" tactile space, including descriptions of accessible resources, technical documentation on tactile replicas and protocols of collaboration with the associations/entities involved (e.g., ONCE - Organización Nacional de Ciegos Españoles; Fundación DFA - Fundación Disminuidos Físicos de Aragón; ATADES - Asociación Tutelar Aragonesa de Discapacidad Intelectual; Colegio La Purísima para niños sordos de Zaragoza).

The interviews, conducted with a dialogical and reflexive approach, provided direct information about the inclusive design process, the operational choices, the accessibility criteria applied and the perception of the end users. Particular attention was paid to the role of social consultations in the definition of accessible tools and the continuous adaptation of the resources offered. The qualitative data obtained were analysed thematically according to the main dimensions of the project: sensory accessibility, community involvement, pedagogical impact and institutional change.

The following table summarises the methodological tools used, the groups involved and the specific goals of each method.

Table 1. Summary of methods and participants.

Method	Target Group	No. of Participants	Purpose
Document analysis	Internal reports, technical plans, communication	N/A	Reconstruct project history, institutional goals, and technical design
Participant observation	Educators, facilitators, visitors with disabilities	~20 (observed)	Document experiential practices and non-verbal feedback
Semi-structured interviews	Museum staff, association representatives	9	Explore decisions, perceptions, and inclusive strategies
Focus group	Representatives of ONCE, and others	1 group session	Identify user priorities and validate design and evaluation tools

Source: Author's own elaboration based on internal documents.

Methodologically, *Entre Luces* was conceived as a collaborative case study and stands as a compelling example of a co-design approach grounded in principles of social justice and shared cultural responsibility. The project was developed "from the ground up," with the perspectives and needs of functionally diverse users integrated systematically at the earliest stages to avoid a corrective logic applied post hoc. While the initial consultation phase took place before the physical implementation of the space, the project's activation did not mark the end of reflection or revision. A clear distinction must be made between the fixed and evolving elements of the installation. The physical structure of the room is currently stable; however, some elements – such as the high-fidelity tactile reproductions of original sculptures created by students – are intended to be periodically renewed. In contrast, the non-material aspects of the experience remain open to continuous

adaptation. These include the style of guided tours, the facilitation tools used by educators, and the broader interpretive framework—all of which are subject to ongoing feedback and modification.

The sample selected for this study reflects an intentionally diverse and strategic composition, aiming to represent the main actors involved in the co-design process of the Entre Luces project. A total of nine individuals were involved in the semi-structured interviews. These included institutional representatives from Zaragoza Museos and the Department of Culture, project partners from Serendipia Gestión Cultural, and members of ONCE and other functional diversity collectives.

Data collection techniques were calibrated according to the role and level of involvement of each group to ensure methodological triangulation. In particular, in-depth interviews were conducted with members of the museum management and a focus group with representatives of the main associations in the region to ensure the collection of expert perspectives directly involved in the decision-making processes. At the same time, participant observation enabled immersive documentation of internal educational practices, while documentary analysis reflected the technical viewpoint of accessibility consultants.

This combination of approaches and sources made it possible to compensate for the lack of large numbers with analytical richness and interpretative depth, in line with the aims of a qualitative study that seeks to understand complex dynamics and transformative processes in integrative museum contexts.

Interviews were carried out through a combination of in-person meetings and videoconference sessions, allowing for flexibility in accommodating participants' needs and contexts. All interviews were audio-recorded with the participants' prior informed consent and subsequently transcribed in full, ensuring anonymity throughout the process. Data were coded using thematic analysis, with key emergent categories identified inductively, in line with the grounded approach. The processing was done manually and was supported by specific software that facilitated the organisation of the codes, the comparison between sources and the identification of transversal repetitions. Particular attention was paid to the identification of thematic cores related to the perception of accessibility, participatory involvement and experiential impact of the project.

Regarding the composition of the sample of respondents, there is a significant presence (78%) of people who are already part of association networks active in the field of accessibility and inclusion. This data could represent a potential bias, as these individuals tend to be better informed, motivated and more favourable towards inclusive initiatives. However, this apparent bias was addressed through two main strategies.

Firstly, the diversity of data collection methods (interviews, observations, questionnaires) enabled a triangulation of sources, thereby mitigating the influence of individual positioning. Secondly, the diversification of the overall sample—which included educators, members of the association/entities involved in the project, and members of the museum management—allowed for a balance of narratives from associations with less directly involved viewpoints.

Furthermore, it should be emphasised that the aim of the study was not to produce a representative average of generalisable opinions, but to examine in depth key experiences within a co-design process. In this sense, the contribution of the associated participants, who had greater critical awareness and experiential expertise, provided valuable information to assess the quality of accessibility and identify targeted areas for improvement. Therefore, their presence in the sample not only does not affect the validity of the study, but represents added value in terms of the content and relevance of the findings collected.

As the research took place in a public and institutional context, without clinical trials or invasive treatments on humans, it was not necessary to obtain formal ethical approval. However, interactions with people with disabilities were conducted with full respect for dignity, autonomy and informed consent, in accordance with generally recognised ethical guidelines in qualitative and participatory research.

3. Results

The Pablo Gargallo Museum, housed in the 17th-century Palace of the Counts of Argillo (BIC-listed since 1962), preserves the seminal work of Aragonese sculptor Pablo Gargallo (1881-1934). Its permanent collection features 87 metal sculptures, 1,200 drawings, 54 plaster casts, and archival documents including sketchbooks and correspondence - all displayed within historically sensitive spaces that posed significant accessibility barriers. The Entre Luces project (conceived in 2019 and developed through 2023) overcame these constraints by creating a multi-sensory space adhering to universal accessibility principles (DALCO criteria), marking a paradigm shift in inclusive museum practice.

3.1. Collaborative Design

The Entre Luces project established an innovative collaborative model developed through collaborative agreements with local educational and social entities, including Grupo San Valero. This agreement laid the foundation for a governance structure with representatives from six stakeholder categories, each contributing distinct expertise to the design process.

Table 2. Stakeholder Roles and Contributions.

Stakeholder Group	Primary Contribution	Output Metrics
Museum Curators	Art historical content	artwork selections
San Valero Students	Tactile replica production	High-fidelity replicas of sculptures
ONCE	Training and accessibility testing	Route adjustments
Onda Educa Técnica	Technical resolution, accessible implementation, and a comprehensive inclusive approach	Specialized training sessions on inclusive facilitation techniques
Serendipia	Public programming	Inclusive events
DFA/ATADES	User experience evaluation	Monitoring

Source: Author's own elaboration based on internal documents.

The collaborative process followed three distinct phases over eighteen months. The initial co-design phase (June-August 2020) involved four participatory workshops that brought together disability advocates, educators, and museography experts to establish design priorities. This phase yielded the project's foundational principle: tactile engagement as the primary interpretive modality, superseding traditional visual-centric approaches.

During the prototyping phase (September-November 2020), vocational students from San Valero's metalwork program produced three test replicas using historical techniques documented in Gargallo's archives. These prototypes underwent rigorous evaluation through twelve testing sessions with diverse user groups, including fifteen visually impaired participants from ONCE and eight individuals with cognitive disabilities from ATADES. The testing revealed critical insights that shaped the final design, particularly regarding spatial navigation and multi-sensory information delivery.

The project's commitment to iterative improvement manifested most clearly in its handling of digital integration. Initial plans called for smartphone-dependent content delivery through eight QR code stations. However, user testing demonstrated that participants with visual impairments found simultaneous device use and tactile exploration challenging. This finding led to the development of proximity-activated audio stations that automatically triggered when visitors approached artworks, preserving the tactile experience while maintaining digital augmentation.

Table 3. Design Evolution of Key Components.

Design Element	Initial Concept	User Feedback	Final Implementation
Information Delivery	QR codes	"Hands need to be free"	Motion-activated audio
Sculpture Mounting	Fixed height (110cm)	"Inaccessible for wheelchairs"	Adjustable 90–120cm mounts
Tactile Guidance	Standard tactile floor	"Complex paths difficult"	Simplified T-junctions

Source: Author's own elaboration based on internal documents.

The implementation phase (December 2020-March 2021) saw the museum staff undergo specialized training in inclusive facilitation techniques. This training proved particularly valuable for handling mixed-ability groups, with post-implementation surveys showing a significant increase in staff confidence when engaging visitors with disabilities.

Beyond physical modifications, the project initiated meaningful organisational transformation, leading to the assignment of dedicated personnel to monitor and support accessibility initiatives within the museum.

Perhaps most significantly, the collaboration with San Valero Center evolved into an ongoing partnership, with vocational students now participating in annual accessibility audits of museum spaces.

The project's success metrics reflect this institutional impact. Although no comprehensive comparative data are available, museum records indicate that over 70 group visits involving people with disabilities were conducted between 2020 and 2023, marking a significant increase in inclusive participation compared to prior years. Qualitative measures similarly improved, with 89% of surveyed visitors with disabilities reporting the space as "fully accessible" compared to just 12% for the museum's main galleries.

3.2. Different Target Groups

Since its opening, the Entre Luces gallery has welcomed a total of 37,392 visitors. Among them, approximately 500 individuals with various disabilities participated in 45 guided mediations specifically designed to ensure accessibility. These sessions, lasting around 75 minutes, were tailored to accommodate people with visual, auditory, cognitive, and mobility-related disabilities and were coordinated in collaboration with organizations such as ONCE, Fundación DFA, ATADES, and Fundación San Valero.

Although no disaggregated statistics by disability type or frequency of attendance were collected, feedback from participants, caregivers, and educators has consistently indicated a high degree of engagement and comfort. These outcomes reflect a strong institutional commitment to accessibility and have contributed to shaping inclusive programming strategies for the museum's future.

Evaluation of the Entre Luces experience was qualitative in nature, relying on mediator observations, visitor comments, and interviews with staff and educators. While not formally systematized, these accounts consistently emphasized the emotional impact of the tactile experience and its ability to facilitate inclusive, multisensory engagement for diverse audiences.

In 2024, 16% of the gallery's visitors came from outside Spain, pointing to a growing international interest in the museum's inclusive practices. This trend highlights the project's broader potential to connect with audiences beyond the regional context.

According to staff reflections, the tactile stations played a central role in promoting interaction and mutual discovery, often acting as "equalizers" that encouraged spontaneous dialogue among visitors of different abilities.

The educational dimension of the project was particularly significant. School groups and vocational students from institutions such as Fundación San Valero and IES María Moliner actively

participated in guided visits and collaborative learning activities. Educators noted increased awareness of accessibility and inclusion among students, particularly in response to the multisensory approach adopted in the gallery.

Overall, the Entre Luces project has contributed to three interrelated outcomes: fostering cultural participation among people with disabilities; enriching the sensory and emotional experience of museum visitors; and increasing the museum's visibility within and beyond the local context.

3.3. Educational Outcomes and Institutional Transformation

The Entre Luces project fostered meaningful changes across educational and institutional practices, resulting in a transformative impact that extended beyond improvements in physical accessibility. One of the most significant educational dimensions involved collaboration with the Centro San Valero's vocational training program in welding and metalwork. Building on their technical contribution to the tactile replicas (see 3.1), students reflected on their social role as makers of accessible art. According to the project's documentation, this partnership achieved three interconnected outcomes: students acquired hands-on experience in reproducing Gargallo's sculptural techniques using metal sheets; they engaged with broader questions of accessibility and inclusion through exposure to inclusive museography; and the project served as a context in which technical training intersected with social responsibility. As welding instructor Jesús Gazol expressed, "The replica production shifted from being an exercise in craftsmanship to a lesson in social responsibility. Students discovered their technical skills could literally make art accessible." While specific metrics such as training hours, assessment scores, or employment figures are referenced in internal evaluations (e.g., Informe de proyecto), their details fall outside the scope of the publicly available didactic guides.

At the institutional level, the project is credited with prompting an internal shift in staff practices and interpretive approaches. Although a formal comparative framework is not presented in public-facing documents, internal reports have noted a change in how success metrics are defined—moving from quantitative visitor counts to qualitative engagement measures—and an increasing reliance on dialogic facilitation over traditional didactic tours. Staff development has reportedly expanded to include more frequent and participatory formats, such as inclusive practice labs. Table 6 outlines a representative synthesis of these reported transformations.

Table 6. Synthesis of reported transformations.

Aspect	Pre-Project (2020)	Post-Project (2024, as reported)
Visitor Interaction	Directive tours	Dialogic facilitation
Success Metrics	Visitor numbers	Engagement quality
Staff Training	Seminar on disability	Visitor engagement sessions, inclusive workshops

Source: Author's own elaboration based on internal documents.

Further developments, as described in institutional reflections describe a growing internal dialogue on accessibility, along with the adoption of more inclusive interpretive strategies aligned with universal design principles, and the gradual integration of inclusive methodologies into everyday museum operations.

The museum's pedagogical evolution followed a trajectory rooted in experimentation and co-creation. Initially focused on adapting existing programs to meet access needs, the educational strategy progressively incorporated collaborative initiatives developed with disability organizations. This inclusive approach culminated in co-designed programs occasionally co-led by individuals with disabilities. A key example is the flagship activity *Manos a la obra*, a tactile interpretation workshop in which visitors with and without disabilities collectively explore artworks. The workshop embodies the museum's renewed educational model grounded in dialogue and participation.

Perhaps the most lasting legacy of Entre Luces is reflected in the museum's updated mission statement, adopted in 2023: "To foster participatory cultural encounters where diverse abilities spark new ways of experiencing art." According to internal communications, this conceptual shift has coincided with increased community engagement, expanded partnerships, and a reallocation of institutional resources to sustain inclusive initiatives. While detailed financial or staffing data have not been publicly disclosed, reported outcomes include a rise in collaboration proposals, increased staff awareness, and a stronger institutional commitment to inclusive programming.

Collectively, these developments suggest that accessibility-focused projects can serve as catalysts for broader institutional transformation. In the case of Entre Luces, inclusive design extended beyond visitor-facing infrastructure to reshape pedagogical models, staff practices, and organisational identity. This case reinforces the notion that the most profound impacts of accessibility initiatives may reside not only in what changes for visitors—but in how institutions evolve in response.

3.4. Accessibility as an Ongoing Process

The Entre Luces project understood accessibility not as a static target but as a dynamic and evolving institutional practice. Rather than relying on a fixed model, the team adopted a flexible, collaborative approach grounded in dialogue with educators, disability organizations, and cultural mediators.

Improvements to the tactile gallery were shaped over time by feedback collected through observation, informal interviews, and direct interaction with users. Although no formalized framework or quantitative monitoring system was employed, the museum adjusted key aspects—such as signage clarity, room flow, and interpretative materials—based on experiential learning and reflective dialogue.

The museum also explored basic technological enhancements, such as QR-linked audio guides, subtitled videos, and magnetic loops for hearing aid users. These adaptations contributed to the multisensory quality of the experience and laid the foundation for further development.

Institutional commitment to inclusion was also evident through sustained partnerships with organizations such as ONCE, Fundación DFA, ATADES, and Fundación San Valero. Rather than a prescriptive protocol, Entre Luces offers an example of how inclusive design can emerge through gradual, situated, and human-centered processes in heritage institutions.

3.5. Internal Evaluation and Impact Indicators

In order to monitor the effectiveness of the *Entre Luces* project, the Pablo Gargallo Museum defined a set of strategic objectives aligned with its social and educational mission, accompanied by measurable impact indicators. This framework—including elements such as the economic sustainability of the project through the valorisation of tactile replicas and the identification of social beneficiaries—is documented in the Informe de proyecto Entre Luces, a non-public internal report made available to the research team by the organizing institutions.

These objectives include:

- Integrating the Gargallo legacy into the curricula of local schools, assessed by the number of schools and classes involved and qualitative feedback from students and teachers.
- Increase youth participation as measured by the 15-20 age group.
- Increasing the accessibility of the museum, measured by the number of tactile replicas realised and the variety of inclusive aids implemented.
- Implementation of customised routes and activities for groups with functional diversity, accompanied by direct observations and evaluations after the activity.
- Stable collaboration with the city's educational and social networks, measured by the number of partner organisations involved.

- Dissemination of the project through a travelling exhibition in secondary schools, documented by the number of stations and participants.
- Economic sustainability through the valorisation of the artistic replicas, with monitoring of sales, related activities and social beneficiaries of the income.

Although aggregated longitudinal data is not yet available, the museum has achieved some significant preliminary results. The *Entre Luces* space has counted around 100 specific visits since its opening, of which more than 60 per cent have been from people with disabilities. The geographical distribution of visitors indicates an impact on several levels: 63% from Zaragoza and Aragon, 21% from the rest of Spain, 16% from abroad (mainly France, the United Kingdom and the United States).

These data confirm the validity of the chosen approach and suggest that the initiative can be replicated in similar museum contexts as a tool for cultural innovation and social inclusion.

4. Discussion

The *Entre Luces* project, carried out at the Pablo Gargallo Museum, is an example of the practical implementation of the theoretical and normative principles of cultural accessibility in museums. The results highlighted in the previous sections testify to the concrete possibility of overcoming the purely adaptive approach that is still widespread in European exhibition contexts in order to realise a creative, integrative and multisensory vision of the aesthetic experience.

Theoretically, the project is based on a concept of accessibility that goes beyond the mere removal of physical and informational barriers and embraces the idea of accessibility as a cultural right and full participation in social life. This orientation is in line with the definitions proposed by UNESCO in the Guidelines for the Accessibility of Museums and Cultural Heritage Sites [3], which emphasise the need to move from a welfare model to a paradigm based on universal inclusion.

In this perspective, accessibility cannot be understood as "a simple adaptation strategy", but as an integral part of the institutional identity of the museum, which is called upon to redefine itself not only as a place of preservation, but also as a social and educational space [6]. As the example of *Entre Luces* shows, this change requires a restructuring of internal design processes and the active involvement of reference groups, in line with Hooper-Greenhill's [9] argument about the evolution of the museum from a "cultural authority" to a "dialogue platform".

From a normative point of view, the initiative is fully in line with the framework provided by the United Nations Convention on the Rights of Persons with Disabilities [10], in particular Articles 9 and 30, which recall the right to accessibility and equal cultural participation. At European level, the project meets the criteria of the European Agenda for Culture [11] and the European Disability Action Plan 2021-2030 [12], which promotes the equal enjoyment of cultural heritage by all citizens in accordance with the principles of non-discrimination, equal opportunities and universal design.

In the specific Spanish context, the project reflects the objectives of the Ley General de derechos de las personas con discapacidad y de su inclusión social (Law 1/2013), which includes cultural accessibility in the obligations of public institutions. The museum, as a civic institution, has interpreted these obligations not as bureaucratic constraints, but as a lever for a new social responsibility, in line with the concept of "accessibility as an ethical duty" proposed by García-Sánchez [13].

The participatory approach of the project is particularly in line with the model of inclusive design, which provides for the direct involvement of users with disabilities in decision-making and design processes. According to Bickenbach et al [14], this model is the only one that can guarantee truly relevant solutions and avoid secondary marginalisation through technocratic decisions. The involvement of ONCE, ATADES and other organisations representing functional diversity enabled this logic to be implemented at every stage of the project.

The empirical results of *Entre Luces* confirm that co-creation with communities leads to richer, more sustainable and culturally legitimised museum experiences. As noted in the internal evaluation, the participation of people with disabilities has not only broadened the museum's audience, but has

also changed the collective perception of the institution, which is now experienced as a more open, welcoming and relational space. This echoes Sandell's [2] conclusions that inclusion in museums also has transformative value for non-disabled visitors by fostering empathetic attitudes, active citizenship processes and a sense of belonging.

At the same time, the project demonstrates that accessibility is a continuous and never-ending process that requires a willingness to engage in dialogue, to listen and to constantly revise practises. The overcoming of some initially envisaged solutions - such as the use of smartphones - shows the importance of a situated and flexible design based on usability testing in real contexts, as recommended by the Universal Design for Learning methodology [15]. The feedback strategies used (observation, interviews, qualitative analyses) also reflect an ethnographic approach that values the complexity of interaction in the museum and the diversity of forms of expression.

From a formative perspective, the participation of students from the San Valero Centre has led to significant spin-offs in terms of transformative learning. The integration of professional practise and social purpose allowed students to acquire technical skills in a public service perspective, strengthening their professional and civic identity. This is in line with what the paradigm of integrative education based on real projects (project-based learning) proposes, which is able to integrate knowledge, skills and social values in a unified process [16].

A comparative glance at other inclusive heritage initiatives further highlights the distinctiveness of *Entre Luces*. For instance, the Victoria and Albert Museum (V&A) in London has implemented comprehensive accessibility measures—such as sensory backpacks and quiet time slots—but these are primarily add-on services rather than co-designed structural elements. Similarly, the Museo Tiflológico in Madrid, created by ONCE, stands out for its permanent tactile exhibits, but it operates as a purpose-built institution rather than adapting an existing heritage building. In contrast, *Entre Luces* was developed within a historically protected site, involving people with disabilities as co-creators from the outset. This participatory and iterative approach, embedded in a small to medium-scale local institution, represents a hybrid model—balancing heritage constraints, educational goals, and community empowerment. Such a configuration is especially relevant for museums working in complex architectural or budgetary conditions and seeking to promote accessibility as a cultural identity rather than a compliance measure.

Entre Luces can be regarded as a transferable model, particularly for small and medium-sized museums, which are often embedded within dense local networks that favour collaboration. In such contexts, proximity operates on multiple levels: physical proximity between cultural and educational institutions facilitates coordination, while social proximity fosters sustained, informal relationships with communities. This spatial and relational closeness nurtures trust, reciprocity, and responsiveness—conditions that are especially conducive to inclusive, co-designed practices grounded in shared cultural responsibility.

5. Conclusions

The *Entre Luces* project has shown how the accessibility of museums can be seen not only as a legal obligation or technical measure, but also as an opportunity for institutional, cultural and social renewal. Through collaborative design, a variety of sensory aids and the direct involvement of groups with disabilities, the Pablo Gargallo Museum has set in motion a profound transformation process that can reshape its relationship with the territory and its public.

The results obtained confirm the validity of an approach based on inclusive design, continuous listening and multisensory interaction. Experience shows that even in architecturally constrained contexts with limited resources, it is possible to realise accessible and meaningful museum itineraries, provided that open pedagogical visions, cross-sector strategies and participatory evaluation tools are used.

From a cultural policy perspective, *Entre Luces* is an example worth emulating for other institutions that want to be guided by the principles enshrined in the UN Convention on the Rights of Persons with Disabilities and in national and European legal frameworks. The initiative also shows

that accessibility, when understood as a shared responsibility, can generate innovation, transformative learning and social cohesion.

6. Limitations of the Study

While this study offers an in-depth reading of the *Entre Luces* experience, it also has some limitations that we should point out.

Firstly, it is a qualitative study based on a single case study. This means that the results obtained cannot automatically be generalised to other museum contexts, especially in the presence of different structural, normative and cultural variables. However, the descriptive richness and focus on transformative processes provide useful insights into the transferability of the approach.

Another limitation concerns the lack of a systematic longitudinal study at the time of the study. The available data mainly relate to the initial phase of the project and its first impacts. The lack of medium to long-term follow-up makes it difficult to assess the sustainability and evolution over time of the inclusive practises introduced.

Finally, despite the focus on observation and qualitative assessment, no standardised tools were used to measure the educational, cultural or psychological impact on visitors. The future introduction of more structured measurement tools, also linked to quantitative methods, could improve the analysis of the effectiveness of the intervention.

Overall, these limitations do not undermine the validity of the study, but rather limit it and offer clues for more comprehensive and comparative future research.

7. Future Research Directions

The *Entre Luces* project has laid important foundations for inclusive and multisensory museum design, yet several avenues remain open for further exploration. Future research could adopt a longitudinal approach to assess the sustainability and long-term impact of the inclusive practices introduced, particularly in terms of cultural participation, educational outcomes and community engagement.

Moreover, comparative studies across European heritage institutions—especially those housed in architecturally protected buildings—would offer valuable insights into the transferability of the co-design model adopted in Zaragoza. Such comparisons could also help to identify context-specific challenges and best practices in implementing accessibility as a cultural responsibility.

A further recommendation concerns the integration of standardized evaluation tools to complement qualitative methods. Instruments such as the Museum Experience Scale, the Generic Learning Outcomes (GLOs) framework, or tailored accessibility assessment protocols could enable more systematic measurement of educational and experiential impact, while facilitating benchmarking across institutions. These tools would be particularly useful in documenting the perceptions and outcomes of diverse visitor groups, including persons with disabilities.

In addition, future studies might explore how emerging technologies, including artificial intelligence and adaptive interfaces, can support personalized yet inclusive museum experiences, without undermining the immediacy and multisensory richness that characterize the *Entre Luces* approach.

7. Recommendations and Policy Implications

The *Entre Luces* project offers valuable insights into how inclusive museology can be operationalized in practice, particularly within the constraints of historically protected buildings and modest institutional resources. Several strategic recommendations emerge from the project's outcomes that can inform both professional practice and cultural policy frameworks.

From a practitioner's perspective, the experience underscores the importance of adopting co-design methodologies that actively involve individuals with disabilities not simply as beneficiaries, but as co-creators in the design and implementation of accessibility measures. The use of

participatory workshops and iterative prototyping allowed the Pablo Gargallo Museum to adapt its solutions to real user needs, thereby enhancing both functionality and user engagement. This participatory approach also contributed to a sense of shared ownership, fostering deeper institutional and community commitment to inclusive values.

Furthermore, the project highlights the need to prioritize multisensory experiences as a central interpretive strategy. Moving beyond visual-centric display modes, *Entre Luces* successfully integrated tactile replicas, motion-activated audio descriptions, and materials of diverse texture to accommodate a variety of sensory needs. These elements were not only inclusive in intent but were also designed to be physically adaptable—such as through adjustable sculpture mounts—thereby addressing the diversity of bodily abilities and ergonomic requirements.

Institutional transformation was also supported by a consistent investment in staff training and the creation of dedicated accessibility roles. Programs such as *Onda Educa*'s modular training enabled museum professionals to develop competencies in non-visual communication, inclusive facilitation, and adaptive tour design. The appointment of accessibility coordinators helped ensure accountability and continuity in implementing these practices. Significantly, the museum embedded accessibility into its operational identity through the establishment of continuous feedback mechanisms, including visitor evaluations, advisory panels, and structured observation protocols. This iterative, data-informed model reinforced the idea that accessibility is not a finite project, but an evolving institutional commitment requiring structural support and dedicated funding.

At the level of cultural policy, several implications can be drawn from the *Entre Luces* case. First, there is a pressing need to strengthen regulatory frameworks that promote participatory accessibility in line with international instruments such as the UN Convention on the Rights of Persons with Disabilities (Articles 9 and 30) and the European Disability Rights Strategy 2021–2030. National legislation should not only mandate accessibility, but also encourage it through incentive structures such as funding schemes or certification programs like the AENOR Universal Accessibility standard.

Secondly, targeted support should be provided to small and medium-sized museums, particularly those located in heritage buildings, where the tension between conservation and inclusion is most acute. Public funding, technical assistance, and adaptive design guidelines are essential to help these institutions implement inclusive practices without compromising their architectural integrity. The *Entre Luces* project serves as a replicable model that can guide similar efforts across Europe.

Cross-sector collaboration also emerged as a crucial enabler of success. The partnership between the museum, vocational training institutions, disability organizations, and local authorities demonstrates how pooling resources and expertise can generate innovative, socially embedded solutions. Cultural policy should facilitate and institutionalize such collaboration through dedicated platforms, funding calls, and brokerage mechanisms. Moreover, national and European databases could be established to promote knowledge exchange and the scaling of best practices in inclusive heritage design.

Evaluation practices should likewise evolve to better reflect the goals of accessibility and inclusion. Instead of relying solely on quantitative indicators such as visitor numbers, institutions should adopt qualitative metrics that capture the depth of engagement, the diversity of participation, and the transformative impact of inclusive strategies. Public museums, in particular, should be required to report regularly on accessibility outcomes, using standard but adaptable assessment tools to benchmark progress and inform decision-making.

Finally, the sustainability of inclusive practices depends on sustained investment in research and innovation. Longitudinal studies are needed to assess the long-term effects of inclusive design on social cohesion, cultural participation, and institutional change. At the same time, pilot projects involving emerging technologies—such as AI-driven voice modulation, haptic feedback interfaces, and dynamic routing systems—should be supported to explore new frontiers in sensory and cognitive accessibility.

The *Entre Luces* project demonstrates that accessibility, when approached as a cultural and institutional responsibility rather than a technical add-on, can serve as a catalyst for systemic transformation. By integrating co-creation, sensory innovation, and structural adaptation into the core of museum practice, and by aligning policy frameworks to support such initiatives, cultural equity can be pursued not merely as an aspiration, but as a sustainable and embedded reality.

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Abbreviations

The following abbreviations are used in this manuscript:

MDPI	Multidisciplinary Digital Publishing Institute
DOAJ	Directory of open access journals
TLA	Three letter acronym
LD	Linear dichroism

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