ALGORITHMIC HEARTBEATS OF CARE: MUSEOTHERAPY, EDUCATIONAL POVERTY, AND AFFECTIVE MEDIATION IN VULNERABLE CHILDHOOD CONTEXTS

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ABSTRACT
Digital technologies increasingly blur the boundary between educational relationships and their algorithmic imitation. This paper examines museotherapy, understood in a non-clinical educational sense, in relation to educational poverty among children experiencing long-term hospitalization. It draws on a qualitative case study conducted by the authors at the "Bottega dei Ragazzi" of the Museum of the Istituto degli Innocenti in Florence (February–June 2026), combining field observation, documentary analysis, and narrative interviews with two key informants. Five pedagogical dimensions emerged: cultural participation, symbolic mediation, narrative meaning-making, relational continuity, and experiential learning. On this basis, the paper develops a prospective, not yet implemented, museum–hospital school pathway integrating immersive environments and generative AI, conceived as support for narrative mediation and cultural participation rather than as a substitute for human relationships.

KEYWORDS
Museotherapy; educational poverty; hospital schooling; generative Artificial Intelligence; cultural participation

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1. Introduction

Digital transformation reshapes educational experience through hybrid environments that reconfigure space, time, presence, and interaction (Floridi, 2014; Morin, 1993; Ceruti & Bellusci, 2020; Clark, 2003, 2005). Physical and digital contexts intertwine within relational ecologies where bodies, technologies, and environments co-evolve (Latour, 2005; Rivoltella et al., 2023). Generative AI raises questions about human agency, knowledge, and the risk of replacing educational relationships (Han, 2014; Luckin et al., 2022). The pedagogical issue is how AI and hybridization may sustain learning, participation, care, accessibility, and meaningful relationships under conditions of vulnerability and distance (Cambi, 2014; Ranieri et al., 2024; Rivoltella, 2014; Sibilio, 2014; Gomez Paloma, 2013).

Long-term pediatric hospitalization makes this issue especially relevant. Educational poverty may involve interrupted schooling and reduced opportunities for cultural participation, exploration, expression, relationships, imagination, and belonging (Save the Children, 2017; Milani, 2020; Fornari & Sannipoli, 2022; Giancola & Salmieri, 2025). Hospital schooling can provide educational continuity and relational mediation (Mancaniello, 2003; Ferri, 2008; Gasperini, 2023), while immersive technologies and AI may connect schools, hospitals, and educational communities through narrative and participatory experiences (Muscarà & Zapparrata, 2017; Carletti, 2021; Arazzi, 2022; Castronova et al., 2020; Cesaretti, 2021).

The museum offers a relevant pedagogical setting. The shift from collection-centred to visitor-centred approaches has reframed heritage as a situated relational experience involving embodiment, memory, exploration, and shared meaning-making (Hooper-Greenhill, 2007; Sandell, 2002; Xanthoudaki, 1998; Breda, 2009; Pruulmann-Vengerfeldt & Runnel, 2014; Manera, 2020). At the

“Bottega dei Ragazzi” of the Museum of the Istituto degli Innocenti, workshops based on archival traces, iconographic details, and narrative practices exemplify symbolic and relational mediation (Del Gobbo et al., 2018; Campanini & Pelliciari, 2022; Bertolini et al., 2023). Immersive technologies and generative AI may extend these possibilities beyond the museum’s physical boundaries (Limone, 2012; Paola & Gomez Paloma, 2018; Clark, 2006).

Drawing on the authors’ case study at the “Bottega dei Ragazzi”, this contribution develops a care-oriented museum–hospital school pathway mediated by immersive technologies and generative AI (di Padova et al., 2023), preserving cultural access during hospitalization through narrative, immersive, and workshop-based reinterpretation rather than simple digitization (Marchionni, 2021; Bondil & Legari, 2022; Cicerchia, 2022).

Two concepts require delimitation. Educational poverty is a multidimensional restriction of opportunities to learn, participate in cultural life, explore, express oneself, and construct meaningful relationships; in long-term hospitalization, this includes reduced cultural, narrative, exploratory, and relational opportunities (Save the Children, 2017; Milani, 2020; Fornari & Sannipoli, 2022). Museotherapy is used in an educational, non-clinical sense: although associated with museum- and art-based practices oriented toward health and well-being, no therapeutic efficacy or clinical outcomes are attributed to museum participation (Bondil & Legari, 2022). It denotes pedagogically mediated museum experiences supporting cultural participation, symbolic elaboration, relational continuity, and well-being through aesthetic, embodied, and narrative practices. The contribution distinguishes the completed case study from a prospective hospital-school model not yet implemented or evaluated with hospitalized children.

2. Methodological Framework: From a Qualitative Case Study to the Design of a Prospective Educational Model

This contribution is part of a broader research project developed at the "Bottega dei Ragazzi" of the Museum of the Istituto degli Innocenti, investigating the relationship between cultural heritage, educational practices, and the reduction of educational poverty in childhood (Milani, 2020; Fornari & Sannipoli, 2022). The empirical component reported here was designed and directly conducted by the authors as a qualitative single-case study (Yin, 2018). Fieldwork took place from February to June 2026 and focused on the educational activities addressed to children aged 3–11. The authors participated directly in the research setting through systematic pedagogical mapping of the activities proposed by the "Bottega dei Ragazzi," observation of workshop practices, and analysis of educational plans, materials, artefacts, and mediation devices. The educational workshops already offered within the "Bottega dei Ragazzi" constituted the empirical field of the study, while their systematic observation and qualitative interpretation, including the identification of the five pedagogical dimensions, constitute the authors' original research contribution.

2.1. Data Sources and Key Informants

Between February and June 2026, eight workshops addressed to children aged 3–11 were directly observed. The empirical corpus comprised three complementary sources: these field observations; documentary and material analysis of workshop plans, materials, artefacts, and mediation devices; and two narrative interviews with adult key informants holding complementary roles within the "Bottega dei Ragazzi." One interviewee was the educator responsible for accompanying school classes during museum activities; the

second was the educator involved in designing the workshops. The interviews were audio-recorded and subsequently included in the qualitative analysis. The analysis reported in this article focuses on educational practices, mediation devices, and professional narratives rather than on individual child outcomes. Field observations focused on educational practices, interactional dynamics, and mediation devices; no identifying personal or clinical data concerning participating children were collected, and no individual assessment of children was undertaken.

2.2. Analytical Procedure and Pedagogical Dimensions

Observational, documentary, and interview materials were examined through an integrated qualitative content analysis with a phenomenological-hermeneutic orientation (Bertolini, 1988; Iori, 1988; Elo & Kyngäs, 2008). The analytical process involved repeated examination of the empirical materials, identification of recurrent units of meaning, comparison across the different sources, progressive grouping of recurrent contents, and their interpretative systematization into broader pedagogical categories. The interview component is reported, where applicable, with reference to the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (Tong et al., 2007); COREQ is used as a reporting framework and not as an analytical method.

This integrated analysis led the authors to identify and systematize five recurrent pedagogical dimensions: cultural participation, symbolic mediation, narrative meaning-making, relational continuity, and experiential learning. These dimensions are not a pre-existing pedagogical model formally developed by the “Bottega dei Ragazzi”; they constitute an original interpretative outcome of the empirical research conducted by the authors on the practices, materials, mediation devices, and professional narratives examined in the case study. The analysis showed recurrent ways in which archives, objects, images, historical

traces, narrative practices, and embodied exploration functioned as symbolic mediators for interpretation, imagination, and shared meaning-making. The wording “effective” is therefore deliberately avoided because the study did not measure intervention outcomes or comparative effectiveness.

2.3. From Empirical Findings to a Prospective Design Proposal

The qualitative case study constitutes the completed empirical level of the contribution. On the basis of the five dimensions identified through this analysis, the authors developed a second, prospective level: an immersive and narrative museum pathway for children aged 6–11 attending hospital schools, integrating cultural heritage, virtual reality, and generative artificial intelligence (Cassese, 2024). This hospital-school pathway is an original design proposal derived from the empirical findings but has not yet been implemented or evaluated with hospitalized children. Consequently, the following sections describe intended procedures, feasibility conditions, and expected pedagogical functions rather than demonstrated effects. The proposal is guided by the question of whether children who cannot physically access museum spaces may nevertheless be offered culturally rich, symbolically meaningful, and relationally mediated opportunities for participation during long-term hospitalization (Mancaniello, 2003; Ferri, 2008; Gasperini, 2023; Bosisio & Cavaletto, 2025).

3. Prospective Project Design: Phases of the Immersive Museum Pathway

The proposed educational pathway is structured into five interconnected phases designed to support continuity between museum experience, hospital schooling, and digital mediation. Each phase is intended to contribute to the construction of a hybrid educational ecology in which cultural heritage, narrative practices, immersive technologies, and generative artificial

intelligence are pedagogically integrated to support participation, meaning-making, and relational continuity in contexts of vulnerability. At the time of writing, these five phases have not yet been implemented with children attending hospital schools.

3.1. Teacher Training and the Construction of the Educational Alliance

The proposed first phase would consist of a training pathway addressed to primary school teachers and hospital school teachers, to be delivered by the museum educators of the “Bottega dei Ragazzi” of the Museum of the Istituto degli Innocenti, together with pedagogists and experts in immersive technologies. The training is not merely technical in nature but deeply pedagogical: teachers would be introduced to the cultural heritage of the Museum of the Istituto degli Innocenti, the narrative practices developed within the museum, and the educational opportunities offered by immersive environments and generative artificial intelligence tools (Cassese, 2024). Particular attention would be devoted to the development of educational dispositions capable of fostering listening, participation, and relational continuity in contexts of vulnerability (Mortari, 2015; Boffo, 2006). From this perspective, teachers would not act as mere facilitators of technology but as pedagogical mediators capable of accompanying children through the symbolic experience of the museum, supporting processes of observation, interpretation, and shared meaning-making (Bruner, 1998; Demetrio, 2012). The training pathway would also include co-design sessions involving the researchers, museum educators, and hospital school teachers, aimed at adapting activities to the diverse conditions of the children involved, the duration of hospitalization, and each child's opportunities for participation (Wenger, 1998; Gasperini, 2023).

3.2. The “Narrative Suitcase” and the Activation of Experience

The proposed second phase would begin with a digital “narrative suitcase” symbolically sent by the museum and co-designed by researchers, museum educators, and hospital-school teachers during the implementation phase. Conceived as a narrative device for activating the educational pathway, it would include short vodcasts developed from artworks, iconographic details, archival traces, and museum stories. Through images, narratives, open-ended questions, and prompts, the vodcasts would introduce children to cultural heritage and direct their attention towards elements later encountered during immersive exploration (Bruner, 1993; Ricoeur, 2005; di Padova et al., 2023).

The suitcase would also contain decontextualized visual and narrative fragments, such as partial photographs of artworks, iconographic details, enlarged images, short audio messages, and incomplete stories. A painted hand, a chromatic detail, a fragment of clothing, a face, or an architectural or symbolic element could become an invitation to observe, describe, formulate hypotheses, establish associations, and construct possible narratives. The aim would not be the correct identification of the image, but the activation of an exploratory and interpretative gaze (Merleau-Ponty, 1976; Berthoz, 2011).

During this phase, the teacher would adopt an attitude of pedagogical suspension similar to that observed in the workshops of the “Bottega dei Ragazzi”: rather than anticipating the meaning of the artwork or correcting interpretations, the teacher would support inquiry through open-ended questions, dialogical prompts, and shared exploratory practices (Iori, 2016).

3.3. Immersive Exploration of the Picture Gallery as a Narrative Inquiry Practice

In the proposed third phase, children would access the immersive environments of the Picture Gallery of the Museum of the Istituto degli Innocenti through VR headsets or navigable platforms available on tablets and interactive whiteboards. Building on the materials encountered in the digital narrative suitcase, the experience would take the form of a narrative treasure hunt in which iconographic details, chromatic fragments, architectural features, and symbolic elements become clues for locating the artworks to which they belong. The activity would thus develop as a progressive inquiry process based on observation, comparison, and hypothesis-building (Ricoeur, 2005; Tarozzi & Francesconi, 2013).

Immersive navigation would allow children to observe artworks from multiple perspectives, use digital zooming tools, and focus on details that may be difficult to notice during a traditional museum visit. They would compare previously encountered clues with the virtual artworks and progressively reconstruct connections between details and works in the Picture Gallery (Limone, 2012). Once an artwork has been identified, teachers and museum educators would guide moments of dialogue and reflection through open-ended questions and narrative prompts, introducing its history, symbolic meanings, and cultural context. Consistent with the educational approach of the "Bottega dei Ragazzi," the aim would not be the mere transmission of information but the shared construction of meaning through observation, imagination, and interpretation (Bertolini, 1988; Bruner, 1998).

The device would remain flexible in relation to children's conditions: activities could be carried out individually, in small groups, or through personalized formats adapted to hospitalization periods and opportunities for participation. Integrated into hospital-school practices, immersive exploration is intended to provide access to cultural and narrative experiences during hospitalization (Mancaniello, 2003; Gasperini, 2023). As the exploratory core of the pathway,

it would lead from the search for clues and the discovery of artworks to the subsequent phase of narrative re-elaboration through the creation of living postcards (Marchionni, 2021; Bondil & Legari, 2022).

3.4. "Living Postcards" as Devices for Digital Storytelling and Cultural Participation

The proposed fourth phase would focus on narrative and creative re-elaboration through the progressive creation of "living postcards", transforming the museum experience into storytelling, symbolic production, and relational continuity (Bruner, 1993; Demetrio, 2012; Ricoeur, 2005). After immersive exploration of the Picture Gallery, children would take part in a hands-on workshop selecting images, colours, symbols, characters, or other elements that engaged their attention, imagination, or emotional world. Drawings, collages, keywords, short stories, audio recordings, and photographs would become narrative traces through which each child could reinterpret the museum experience (Mortari, 2015; Bellingreri, 2013). The postcard would thus function not merely as a final product, but as a narrative and relational device connecting cultural heritage with personal experience, inner images, emotions, and the distance imposed by hospitalization (Bruner, 1998; Kaneklin & Scaratti, 1998; Demetrio, 1993; Palma & Amatori, 2024).

Generative AI and digital storytelling tools would be used through adult pedagogical mediation (Arsena, 2023; De Marco & Fiore, 2022; Fiorucci & Bevilacqua, 2024). Children's original drawings would remain unmodified, preserving their expressive and graphic authenticity, while algorithmic mediation would support the narrative and multimodal environment in which they are situated (Rivoltella, 2012; Ranieri et al., 2024). Through Book Creator and other approved multimodal tools, living postcards could develop into

digital micro-stories combining images, voice recordings, environmental sounds, narrated words, and simple visual movements, while keeping the child's production at the centre of the experience (Limone, 2012). For example, a drawing developed from a detail encountered during immersive exploration could be accompanied by the child's voice and, through adult-mediated AI, by non-identifying environmental sounds, vocalized keywords, or narrative links among different postcards. Technology would therefore not generate content "instead of" the child, but support the transformation of children's symbolic productions into shareable narrative environments (Floridi, 2014; Luckin et al., 2022).

Each postcard would be symbolically addressed to the Istituto degli Innocenti and the "Bottega dei Ragazzi", becoming an act of narrative restitution through which the child leaves a personal trace within the museum's educational and relational heritage. Subject to specific consent and data-protection safeguards, selected materials could also contribute to a participatory digital archive preserving images, voices, stories, observed details, and interpretations produced throughout the pathway (Colazzo & Del Gobbo, 2022).

3.5. Returning to the Museum and Narrative Continuity

The proposed fifth phase could include an in-person visit to the Museum of the Istituto degli Innocenti whenever health conditions allow. Children would access spaces previously explored through immersive and narrative activities, creating a bridge between the hospital experience and direct encounter with cultural heritage and enabling recognition of artworks, iconographic details, and narrative traces encountered through digital mediation (Merleau-Ponty, 1976; Sibilio, 2014; Damiani & Gomez Paloma, 2018).

At the "Bottega dei Ragazzi", the museum educator would revisit the materials produced during the pathway, particularly the living postcard, using it as an

educational mediator between hospitalization and the in-person museum experience. Images, details, and narratives emerging from the workshop would support activities of observation, comparison, and reinterpretation aimed at deepening the symbolic, relational, and cultural meanings of the heritage on display (Mancaniello et al., 2023).

The visit would also provide opportunities for children to present their living postcards, recount their experiences, and connect their productions with the artworks, intertwining cultural heritage, personal experience, and narrative through dialogical and interpretative practices (Ricoeur, 2005; Tarozzi & Francesconi, 2013; Iori, 1988).

Subject to specific consent, selected living postcards from the future pilot could contribute to a participatory digital archive linked to the educational activities of the "Bottega dei Ragazzi". By preserving children's images, audio recordings, stories, and other materials, the archive could support future educational initiatives and contribute to a shared memory of experiences developed between the hospital school and the museum (Wenger, 1998; Sandell, 2002; Hooper-Greenhill, 2007).

3.6. Technological, Ethical, and Data-Protection Safeguards

As the hospital-school pathway is prospective, its technological architecture is presented as an implementation framework. Immersive access would use navigable 360°/VR museum content through standalone headsets, tablets, or interactive whiteboards, according to the child's condition and the hospital-school setting. Book Creator would serve as the multimodal authoring environment for assembling drawings, images, text, and, where specifically authorized, voice recordings into living postcards and digital narratives. Generative AI would be limited to adult-mediated functions, including narrative linking, text-to-speech or voice support, and the generation or selection of non-

identifying environmental sounds. No open-ended child-to-chatbot interaction is envisaged, and children's original drawings would neither be replaced nor aesthetically transformed. All AI-generated material would be reviewed by an adult educator or researcher before use (Miao & Holmes, 2023). Any additional generative-AI service would be selected during implementation according to institutional approval, age appropriateness, data-protection compliance, and the possibility of ensuring adult-mediated use.

Protection of minors' data would be a prerequisite for implementation. The pilot would require appropriate institutional authorizations and, where applicable, ethics review, informed consent from parents or legal guardians, and age- and condition-appropriate child assent. Data minimization and pseudonymization would be applied. Names, clinical information, photographs, voice recordings, or other identifying data would not be entered into generative-AI prompts unless a specifically authorized and institutionally controlled workflow were available. Only services compatible with Regulation (EU) 2016/679 and institutional data-processing requirements would be used. Separate consent would be required for including children's productions in a participatory digital archive or for subsequent educational dissemination, with defined procedures for access, retention, and withdrawal (European Parliament & Council of the European Union, 2016; Miao & Holmes, 2023).

3.7. Evaluation Plan for the Future Pilot Study

The first implementation phase will be evaluated as an educational feasibility and process study rather than an efficacy trial. The evaluation will examine feasibility, acceptability, adaptability to hospitalization conditions, participation, narrative engagement, technological burden, and perceived continuity between hospital schooling and museum experience. Data collection will combine structured field observations, analysis of children's narrative and

creative productions, and semi-structured interviews with hospital-school teachers. Interviews will explore the model's perceived educational relevance, integration into hospital-school routines, observed participation, the value and limits of narrative and technological mediation, accessibility, and sustainability of the museum-hospital connection. Descriptive implementation indicators may include participation, activity completion, duration, and technical interruptions. No clinical or therapeutic outcomes are claimed. Qualitative materials will be analysed through content analysis, comparing observations, productions, and teacher interviews across sources.

4. Discussion

The contribution distinguishes two levels of analysis that should not be conflated. The five pedagogical dimensions emerged from the qualitative case study completed by the authors at the "Bottega dei Ragazzi", whereas the museum–hospital school pathway constitutes a prospective design proposal developed from those findings. The discussion therefore concerns the pedagogical plausibility, transferability, feasibility, and ethical conditions of the proposal rather than demonstrated effectiveness.

The proposal is situated at the intersection of cultural heritage, hospital schooling, immersive technologies, and artificial intelligence. Its pedagogical value does not lie in technological innovation per se, but in the possibility of rethinking the conditions through which experience, cultural participation, and meaning-making can be sustained in contexts marked by vulnerability, distance, and biographical discontinuity (Morin, 1993; Ceruti & Bellusci, 2020; Floridi, 2014). From this perspective, hospital schooling is not reduced to a compensatory device for curricular continuity, but is understood as an educational space capable of maintaining connections with the child's cultural and social horizons (Mancaniello, 2003; Ferri, 2008; Gasperini, 2023) and

supporting participation in meaningful shared practices (Milani, 2020; Muscarà & Zapparrata, 2017).

The museum consequently assumes a generative educational function. Beyond preservation and transmission, it becomes a space for interpretation, imagination, and participation (Hooper-Greenhill, 2007; Sandell, 2002; Xanthoudaki, 1998), consistent with the shift from collection-centred to visitor-centred approaches in which cultural heritage is experienced rather than merely known (Breda, 2009; Pruulmann-Vengerfeldt & Runnel, 2014; Manera, 2020). Artworks, iconographic details, traces, and narratives may thus act as mediators through which children construct meanings and reinterpret experience (Del Gobbo et al., 2018; Bertolini et al., 2023).

Within this framework, narrative mediation supports continuity throughout the pathway. The narrative suitcase, vodcasts, immersive exploration, and living postcards function as interconnected devices rather than isolated activities. Storytelling therefore assumes an epistemological, rather than merely communicative, role by organizing experience and returning it to oneself and to others (Bruner, 1993; Ricoeur, 2005; Demetrio, 2012). The seriality of the vodcasts is hypothesized to support an educational temporality capable of counteracting the fragmentation associated with hospitalization and maintaining continuity between encounters. Similarly, virtual reality is conceived not as a simulation of presence, but as a form of access to experience (Limone, 2012). The detail-based “hermeneutic treasure hunt” promotes inquiry, slow observation, and progressive meaning-making, transforming the detail into an interpretative threshold through which cultural heritage can be questioned (Tarozzi & Francesconi, 2013; Ricoeur, 2005). Knowledge is thus constructed through the relationship among subject, environment, and heritage (Wenger, 1998; Merleau-Ponty, 1976).

The same relational criterion informs the role assigned to artificial intelligence. In response to the risk of interpreting generative systems as substitutes for educational relationships or as devices that simulate affective proximity (Han, 2014; Floridi, 2014), the proposed model limits AI to supporting narrative mediation, symbolic production, expressive continuity, and accessibility, while preserving the centrality of the educational encounter (Rivoltella et al., 2023). This approach also reframes the child's role: rather than remaining a recipient of cultural action, the child may become an author and co-constructor of meaning through narratives, interpretations, and living postcards that, in a future pilot, could return to the museum and inform subsequent educational pathways (Sandell, 2002; Wenger, 1998).

This circularity represents a pedagogically significant feature of the proposal. Hospital schooling would not merely receive the heritage produced by the museum, but would participate in its transformation, connecting museums, hospitals, and educational communities within a shared educational ecology (Muscarà & Zapparrata, 2017; Carletti, 2021; Arazzi, 2022). Children's productions could cross institutional boundaries and generate new educational experiences, supporting a process of mutual transformation (Del Gobbo et al., 2018). The possible final visit to the museum would therefore represent not simply the conclusion of the pathway, but an encounter with a place already inhabited narratively and symbolically. Digital and embodied experience would become complementary moments of the same educational process (Sibilio, 2014; Gomez Paloma, 2013), supporting experiential continuity and a sense of belonging to a broader cultural community (Merleau-Ponty, 1976).

The proposal therefore invites a reconsideration of the relationship between cultural heritage, care, and education within digital ecologies. The issue is not to introduce technology into contexts of vulnerability, but to design educational devices capable of sustaining participation, meaning-making, and

belonging when biographical circumstances threaten the continuity of experience (Mortari, 2020; Bellingreri, 2013; Biasin, 2024). In this sense, the museum may be understood as a space mediating memory, imagination, and future possibilities, while immersive environments and artificial intelligence can broaden access without replacing the relational and human character of the educational experience (Marchionni, 2021; Bondil & Legari, 2022).

Some limitations delimit the scope of these considerations. The empirical findings derive from a single museum case studied between February and June 2026 and include two narrative interviews with professionals; the five dimensions constitute interpretative categories generated within this specific context and are not presented as universally generalizable. The empirical phase did not assess individual outcomes in children or intervention effectiveness. Moreover, the museum–hospital school pathway has not yet been implemented; its feasibility, acceptability, educational relevance, technological sustainability, and data-protection procedures will therefore need to be examined in the planned pilot before broader conclusions can be drawn.

5. Conclusions

This contribution has explored how museums, hospital schools, and emerging technologies may contribute to educational ecologies oriented toward care, the reduction of educational poverty, and forms of educational museotherapy grounded in cultural participation. Drawing on the authors' empirical case study at the "Bottega dei Ragazzi" of the Museum of the Istituto degli Innocenti, it proposes an immersive and narrative pathway aimed at maintaining connections between hospitalized children, cultural heritage, and the broader educational community.

A central feature of the proposal is the shift from the child as recipient of cultural experiences to active producer of meaning. If implemented, living

postcards and their return to the museum could allow children's narratives to become part of a shared educational heritage and open new opportunities for participation and learning. The first pilot will therefore investigate feasibility, acceptability, participation, and perceived educational relevance rather than intervention effectiveness, combining field observations, analysis of children's narrative and creative productions, and qualitative interviews with hospital-school teachers.

The museum may thus be understood not only as a place of heritage preservation but as a node within a broader educational ecosystem connecting learning, cultural participation, and educational communities (Ellerani, 2024). The challenge is not simply to introduce technologies into contexts of vulnerability, but to create environments that sustain experience, culture, and belonging while preserving the human and formative dimension of education (Bruni, 2023). Museums, hospital schools, and educational communities can therefore be conceived as interconnected nodes within the same relational ecology, enabling children to participate in cultural life and construct meaning even under conditions of distance, care, and vulnerability. Technologies acquire educational value not by replacing relationships, but by supporting children in maintaining connections with others, culture, and the world (Dozza, 2025).

References

Arazzi, G. (2022). Scuola e territori: Trame di coevoluzione per reinventare il mondo. *IUL Research, 3*(5), 230–239.

Arsena, A. (2023). La lezione con storytelling digitale: Per una narratività relazionale ed inclusiva attraverso la Rete. *Annali Online della Didattica e della Formazione Docente, 15*(26), 3–16.

Bellingreri, A. (2013). Il metodo educativo "centrato sull'empatia". *Studium Educationis, 14*(2), 7–17.

Bertolini, C., Landini, A., Scipione, L., & Vezzani, A. (2023). La scuola al museo: L'esperienza di apprendimento dal punto di vista degli alunni. *LLL: Lifelong Lifewide Learning, 14*(31), 391–407.

Bertolini, P. (1988). *L'esistere pedagogico. Ragioni e limiti di una pedagogia come scienza fenomenologicamente fondata*. La Nuova Italia.

Berthoz, A. (2011). *La semplessità*. Codice.

Biasin, C. (2024). Per una pedagogia della vulnerabilità: Proposte e condizioni dell'accompagnamento educativo. In *Costruire inclusione sociale e cooperare per il benessere delle comunità* (pp. 113–128). FrancoAngeli.

Boffo, V. (2006). *La cura in pedagogia. Linee di lettura*. Clueb.

Bondil, N., & Legari, S. (2022). "Museotherapy": A new concept for promoting health, well-being, and therapy through art. In L. Tay & J. O. Pawelski (Eds.), *The Oxford handbook of the positive humanities* (pp. 483–499). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780190064570.013.22

Bosisio, R., & Cavaletto, G. M. (2025). *La scuola in ospedale*. FrancoAngeli.

Breda, M. G. (2009). Formazione e ruolo degli operatori museali e turistici per un piano di rilancio del museo. *Annali della Facoltà di Scienze della Formazione dell'Università degli Studi di Catania, 8*, 135–144.

Bruner, J. S. (1993). The autobiographical process. In R. Folkenflik (Ed.), *The culture of autobiography: Constructions of self-representation* (pp. 38–56). Stanford University Press.

Bruner, J. S. (1998). A narrative model of self construction. In J. G. Snodgrass & R. Thompson (Eds.), *The self across psychology: Self recognition, self awareness and the self concept* (pp. 145–161). New York Academy of Sciences.

Bruni, E. M. (2023). Lessico pedagogico e realtà educativa. *Cultura Pedagogica e Scenari Educativi, 1(*1), 020–024.

Cambi, F. (2014). *Cura di sé come processo formativo: Tra adultità e scuola*. Laterza.

Campanini, R., & Pelliciari, C. (2022). Il progetto "Scuola IN Museo": Da risorsa nella pandemia a opportunità per un cambiamento educativo e culturale. *Museologia Scientifica Memorie, 22*, 23–28.

Carletti, C. (2021). Costruire comunità educanti. Una nuova alleanza formativa tra ambiente naturale, culturale e digitale. In G. R. Mangione, C. Cannella, & F. De Santis (Eds.), *I Quaderni della Ricerca 59*. Loescher.

Cassese, F. P. (2024). *Emozioni vs algoritmi in campo educativo*. Gaia.

Castronova, L., Rach, S., & Morandi, R. (2020). Virtual reality and augmented reality in educational design: A systematic review. *Educational Technology Research & Development, 68*(3), 15–32.

Ceruti, M., & Bellusci, F. (2020). *Abitare la complessità. La sfida di un destino comune.* Mimesis.

Cesaretti, L. (2021). Intelligenza artificiale e educazione: Un incontro tra due mondi. Rischi ed opportunità*. Rivista di Scienze dell'Educazione, 59*(1), 81–98.

Cicerchia, A. (2022). Welfare culturale oltre la sperimentazione. *Economia & management: la rivista della Scuola di Direzione Aziendale dell'Università L. Bocconi*, (1), 39-42.

Clark, A. (2003). *Natural-born cyborgs: Minds, technologies, and the future of human intelligence*. Oxford University Press.

Clark, A. (2005). Intrinsic content, active memory and the extended mind. *Analysis, 65*(1), 1–11.

Clark, A. (2006). Memento's revenge: The extended mind, extended. In R. Menary (Ed.), *The extended mind* (pp. 43–66). Ashgate.

Colazzo, S., & Del Gobbo, G. (2022). Patrimoni culturali e comunità: Relazioni plurali da maneggiare con cura. *LLL: Lifelong Lifewide Learning, 10*, 1–10.

Damiani, P., & Gomez Paloma, F. (2018). Educational ECS: Un approccio embodied cognitive per le scuole. *Giornale Italiano della Ricerca Educativa, 21*, 74–82.

De Marco, E. L., & Fiore, I. (2022). Storytelling digitale e educazione al patrimonio immateriale: Una revisione descrittiva. *LLL: Lifelong Lifewide Learning, 18*, 84–99.

Del Gobbo, G., Torlone, F., & Galeotti, G. (2018). *Le valenze educative del patrimonio culturale.* Aracne.

Demetrio, D. (1993). *Raccontarsi. L'autobiografia come cura di sé*. Raffaello Cortina.

Demetrio, D. (2012). *Educare è narrare. Le teorie, le pratiche, la cura*. Mimesis.

di Padova, M., Dipace, A., & Pettoello-Mantovani, M. (2023). Quando l'istruzione diventa cura: La scuola in ospedale, un esempio di comunità educante. I*UL Research, 4*(8), 177–191.

Dozza, L. (2025). Attraversare i muri: Motivazione, impegno, scoperta di sé e del "mondo". *Formazione & Insegnamento, 23*(S1), 13–20.

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107–115.

Ellerani, P. (2024). Pedagogia e didattica degli ecomusei: Per lo sviluppo dell'ecosistema formativo. *Q-Times Webmagazine*, *16*(1), 13–26.

European Parliament & Council of the European Union. (2016). Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016. *Official Journal of the European Union, L 119*, 1–88.

Ferri, V. (2008). La scuola in ospedale. In Le attività di animazione in ospedale. Repertorio.

Fiorucci, A., & Bevilacqua, A. (2024). Promuovere l'inclusione e la partecipazione sociale delle persone con disabilità attraverso l'intelligenza artificiale: Un focus sulla disabilità visiva. *Medical Humanities & Medicina Narrativa, 9*(2), 165–181.

Floridi, L. (2014). *The fourth revolution: How the infosphere is reshaping human reality*. Oxford University Press.

Fornari, M., & Sannipoli, M. (2022). La povertà educativa oggi. *Scuola Democratica, 1*(2), 173–191.

Gasperini, R. (2023). La scuola in ospedale, parte integrante di una rete per la cura e il benessere. In G. Paoletti, R. Gasperini, & P. Turina (Eds.), *Protagonisti e non solo pazienti*. EUT.

Giancola, O., & Salmieri, L. (2025). Oltre la scuola: Cause e conseguenze della povertà educativa. *La Ricerca, 28*, 6–12.

Gomez Paloma, F. (2013). *Embodied cognitive science. Atti incarnati della didattica.* Edizioni Nuova Cultura.

Han, B.-C. (2014). *La società della trasparenza*. Nottetempo.

Hooper-Greenhill, E. (2007). *Museums and education: Purpose, pedagogy, performance*. Routledge.

Iori, V. (1988). *Essere per l'educazione*. La Nuova Italia.

Iori, V. (2016). Lo studioso che ha dato vita e respiro alla pedagogia fenomenologica in Italia: Piero Bertolini. *Encyclopaideia, 20*(45).

Kaneklin, C. L., & Scaratti, G. (1998). *Formazione e narrazione*. Raffaello Cortina.

Latour, B. (2005). *Reassembling the social*. Oxford University Press.

Limone, P. (2012). *Ambienti di apprendimento e progettazione dida*ttica. Carocci.

Luckin, R., George, K., & Cukurova, M. (2022). *AI for school teachers*. Routledge.

Mancaniello, M. R. (2003). Il trauma dell'ospedalizzazione nell'infanzia e nell'adolescenza: Il ruolo della scuola. *Rassegna dell'istruzione*, 4–5, 59–77.

Mancaniello, M. R., Marone, F., & Musaio, M. (2023). *Patrimonio culturale e comunità educante*. Mimesis.

Manera, L. (2020). L'innovazione digitale tra didattica museale e didattica scolastica*. Ricerche di S/Confine, 1*, 52–64.

Marchionni, G. (2021). I musei e il welfare culturale. Quaderni del Volontariato, 2, 12–18.

Merleau-Ponty, M. (1976). *Phénoménologie de la perception*. Gallimard. (Opera originale pubblicata nel 1945)

Miao, F., & Holmes, W. (2023). *Guidance for generative AI in education and research.* UNESCO.

Milani, L. (2020). Povertà educativa e Global Education. *Education Sciences & Society, 2*, 444–457.

Morin, E. (1993). *Introduzione al pensiero complesso.* Sperling & Kupfer.

Mortari, L. (2015). *La pratica dell'aver cura*. Mondadori.

Mortari, L. (2020). *Aver cura di sé*. Raffaello Cortina.

Muscarà, M., & Zapparrata, M. V. (2017). Scuola e territorio: le città educative per la promozione della cittadinanza attiva e la coesione sociale. *Sapere pedagogico e Pratiche educative*, *1*, 205-220.

Palma, F., & Amatori, G. (2024). Il gioco come apprendimento: IA e gamification per percorsi di apprendimento personalizzati nella scuola in ospedale*. Medical Humanities & Medicina Narrativa, 9(*2), 101–115.

Paola, D., & Gomez Paloma, F. (2018). Educational ECS. *Giornale Italiano della Ricerca Educativa, 11*, 73–82.

Pruulmann-Vengerfeldt, P., & Runnel, P. (2014). When the museum becomes the message for participating audiences. In *Democratising the museum* (pp. 35–54).

Ranieri, M., Cuomo, S., & Biagini, G. (2024). *Scuola e intelligenza artificiale*. Carocci.

Ricoeur, P. (2005). *Percorsi del riconoscimento*. Raffaello Cortina.

Rivoltella, P. C. (2012). *Neurodidattica*. Raffaello Cortina.

Rivoltella, P. C. (2014). *La previsione. Neuroscienze, apprendimento, didattica*. La Scuola.

Rivoltella, P. C., Villa, A., & Bruni, F. (2023). *Curricoli digitali.* FrancoAngeli.

Sandell, R. (2002). *Museum, society, inequality*. Routledge.

Save the Children. (2017). *Sconfiggere la povertà educativa in Europa*. Save the Children.

Sibilio, M. (2014). *La didattica semplessa*. Liguori.

Tarozzi, M., & Francesconi, D. (2013). Introduzione: Per un'embodied education fenomenologicamente fondata. *Encyclopaideia, 17*(37), 11–17.

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care, 19*(6), 349–357.

Wenger, E. (1998). Communities of practice: Learning as a social system. *Systems Thinker, 9*(5), 2–3.

Xanthoudaki, M. (1998). Is it always worth the trip? *Cambridge Journal of Education, 28(*2), 181–195.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE.