education sciences

Article

Learning to Care: Exploring the Missing Intersection Between Cultural Heritage and Risk Education in Childhood

Sara Fiorentino *, Anna Casarotto, Ilenia Falbo, Giacomo Sigismondo and Mariangela Vandini

Department of Cultural Heritage, University of Bologna, Ravenna Campus, 48121 Ravenna, Italy; anna.casarotto3@unibo.it (A.C.); ilenia.falbo@unibo.it (I.F.); giacomo.sigismondo2@unibo.it (G.S.); mariangela.vandini@unibo.it (M.V.)

* Correspondence: sara.fiorentino2@unibo.it

Abstract

Although child-centred approaches are increasingly adopted in disaster risk reduction (DRR) education, cultural heritage remains largely absent from pedagogical models addressing risk, agency, and community belonging. This study explores how heritage-based experiential learning can support young children's cognitive, emotional, and civic development in DRR contexts. A qualitative intrinsic case study was conducted with 18 pupils (ages 8–9) in a primary school in Ravenna, Italy, through a four-session intervention grounded in Learning-by-Doing and Play-Based Learning. Activities included risk identification games, *tableaux vivants*, archaeological puzzles, and a simulated triage of heritage objects. Data from structured observations, teacher notes, children's artefacts, and feedback discussions were analysed through qualitative content analysis. Findings indicate that experiential, embodied, and collaborative tasks facilitated children's understanding of risk, promoted metacognitive reflection, and nurtured an emerging sense of responsibility toward cultural heritage. Heritage provided a meaningful learning context that supported emotional engagement, sense-making, and early civic agency. The study highlights the pedagogical value of integrating cultural heritage into DRR education and suggests avenues for extending holistic, community-relevant learning in early childhood.

Keywords: heritage education; disaster risk reduction (DRR); education for sustainable development (ESD); childhood learning; play-based learning

1. Introduction

In recent years, cultural heritage has increasingly been recognised not only as a legacy of the past but also as a living resource exposed to growing environmental, climatic, and anthropogenic threats. Research has progressively highlighted the need to integrate heritage within broader resilience and Disaster Risk Reduction (DRR) strategies, reframing it as a dynamic component of community identity and social sustainability (Cross & Giblin, 2023; Labadi, 2022). Within this perspective, heritage contributes to intercultural dialogue, belonging, and social cohesion—dimensions central to community resilience (Council of Europe, 2005; UNESCO, 2021).

Within the framework of the 2030 Agenda for Sustainable Development, heritage is increasingly acknowledged as a cross-cutting enabler of sustainability, with strong connections to education, resilience, and inclusive governance (UCLG, 2020; UNESCO, 2021). Although cultural heritage does not appear as a stand-alone Sustainable Development Goal, it plays a direct role in SDG 4 (Quality Education), SDG 11 (Sustainable Cities and

Received: 20 January 2026
Revised: 24 February 2026
Accepted: 27 February 2026
Published: 3 March 2026

Communities), and SDG 16 (Peace, Justice and Strong Institutions), particularly in relation to community participation and the safeguarding of shared values (Labadi et al., 2021). Recent international guidance further emphasises the importance of integrating climate change and sustainability across school curricula from early educational stages, defining age-appropriate learning outcomes and whole-system approaches to education (UNESCO, 2024).

A growing body of recent work specifically examines cultural heritage within risk and resilience frameworks. Fontanella Pisa and colleagues (Fontanella Pisa et al., 2025) highlight an increasing interest in how heritage can shape community responses to natural hazards. Similarly, Giuliani and co-authors (Giuliani et al., 2021) propose methodologies for assessing and managing risks to material heritage in urban settings. Further contributions include ICCROM's training programmes on FAR—First Aid and Resilience for Cultural Heritage (ICCROM, 2019), which focus on the protection of heritage assets during disasters, and the recent study by Agbugba and co-authors (Agbugba et al., 2025), which explores ways to involve young people in heritage-related risk management.

Taken together, these studies confirm that the heritage–DRR nexus is expanding. However, it remains predominantly focused on adult communities, governance structures, technical conservation, and urban planning—or, at most, on "youth" conceptualised as young adults or early-career professionals. When it comes to community-level strategies and engagement, children remain almost entirely absent from this field, both as subjects of analysis and as potential contributors to heritage resilience.

International frameworks—such as the Comprehensive School Safety Framework (GADRRRES, 2022), UNICEF's Education in Emergencies Guidelines (UNICEF, 2020) and the United Nation Office for Disaster Risk Reduction (UNDRR, 2019)—emphasise child-centred approaches to preparedness and risk awareness. Empirical studies show that participatory and emotionally attuned teaching practices can strengthen children's comprehension of hazards and support the development of protective behaviours (Amri et al., 2017; Gabrielli & Fregola, 2021; Sigamani et al., 2023). NGO-led initiatives further reinforce this evidence. Save the Children's programmes on Child-Led Disaster Risk Reduction (Save the Children, 2015) and the European project *CUIDAR–Cultures of Disaster Resilience Among Children and Young People* (European Commission, 2015) demonstrate that children can take active roles in preparedness, communication, and community engagement. Similarly, case studies from post-disaster contexts illustrate children's contributions to resilience-building, from the preservation of oral traditions to the creation of participatory recovery narratives (Kamal, 2008; West & Theis, 2007).

Yet, despite the growth of DRR education targeting children, none of these studies or initiatives incorporate cultural heritage as a pedagogical mediator for understanding risk, nor as a meaningful context for developing agency or belonging. The two strands of literature—heritage & DRR on one side, and children & DRR on the other—remain almost completely disconnected. DRR research conceptualises children as learners or agents of preparedness but does not consider how cultural heritage might deepen their engagement with risk, foster emotional connections to place, or strengthen community-based resilience. Conversely, studies on cultural heritage and disaster response highlight vulnerabilities, emergency planning, and the role of communities, yet they do not address children, nor investigate their potential contributions to safeguarding heritage at risk.

This double gap reveals an overlooked research space: no existing studies investigate how cultural heritage can support children's learning about risks, or how heritage-based pedagogies might foster early citizenship and resilience. This absence is striking given that cultural heritage—through its tangible and intangible dimensions—offers children concrete,

affectively rich entry points to understanding vulnerability, care, and shared responsibility within their communities.

Recent studies emphasise the importance of engaging children as active participants in the interpretation, transmission, and re-creation of heritage (Chatterjee & Hannan, 2015; Fiorentino & Vandini, 2024; Hackett et al., 2020; Zhang et al., 2024) and early childhood is widely recognised as a formative period for developing curiosity, empathy, and responsibility towards others and the environment.

Heritage Education aligns with these developmental needs through playful, experiential, and inquiry-based approaches capable of strengthening cognitive, emotional, and social skills. This pedagogical orientation is consistent with European and international frameworks emphasising participation and community engagement in heritage-related learning (Council of Europe, 2005; UNESCO, 2015).

In this sense, adopting heritage as an educational mediator within DRR may foster early forms of citizenship, enhance children's understanding of environmental and cultural vulnerabilities, and promote a sense of agency connected to the protection of meaningful places.

Building on this background, the present study investigates the role of cultural heritage as an educational tool for fostering early citizenship and risk awareness. Specifically, it examines how Learning-by-Doing and Play-Based Learning—approaches widely adopted in science education—can be adapted to heritage-focused civic education. Through an empirical case study, the research analyses the educational, affective, and civic outcomes of a heritage-based learning experience grounded in Learning-by-Doing and Play-Based Learning approaches. The study addresses the following research questions:

RQ1: *To what extent does a heritage-based simulation activity support primary school students' understanding of cultural heritage vulnerability and disaster risk?*

RQ2: *How do students experience and interpret the simulation in terms of engagement, emotional involvement, and perceived learning related to care, responsibility, and citizenship?*

2. Materials and Methods

This study adopts a qualitative, exploratory intrinsic case study design (Stake, 1995), appropriate for investigating a bounded educational intervention implemented in a naturalistic school context. The project also incorporates elements of action research, as the research team collaborated with the classroom teacher to iteratively adapt activities to students' needs and to reflect on emerging outcomes. The study aims to explore how experiential and play-based approaches can support children's understanding of cultural heritage and risk awareness.

The initiative involved 18 third-grade children (ages 8–9, one with special educational needs) and their class teacher from Ettore Burioli Primary School in Savio (Ravenna, Italy). The school serves a mixed socio-economic catchment area, typical of peri-urban contexts in the Ravenna municipality. The project was conducted as part of the municipality's *Territorial Educational Enrichment Plan* (2024–2025) (Comune di Ravenna, n.d.) and supported by the national civil-protection awareness initiative *Io Non Rischio 365* (Io Non Rischio, n.d.). All activities took place in the children's regular classroom during school hours. The participating school was not selected by the research team. Rather, the class teacher chose the *Occhio al Rischio!* project from the educational opportunities included in the municipality's *Territorial Educational Enrichment Plan* and contacted the research team to implement the intervention. The focus on flood risk emerged through a preliminary discussion with the teacher, as the school is located in an area affected by the 2023 Emilia-Romagna floods and several pupils had directly experienced the event with their families.

This context-sensitive selection reflects a purposive case definition consistent with the intrinsic case study approach. Although the limited sample size does not allow statistical generalisation, the intervention was situated within an authentic post-disaster context, enhancing the ecological validity of the study and supporting the potential transferability of its educational implications to similar risk-exposed settings.

The initiative was embedded within two broader heritage-risk projects promoted by the Department of Cultural Heritage of the University of Bologna: *SIRIUS–Strategies for the Management of Cultural Heritage at Risk* (SIRIUS, n.d.), part of the NRRP project *PE5 CHANGES–Cultural Heritage Active Innovation for Sustainable Society* (CHANGES, n.d.), and *RESTART–Resilience and Territorial Development: Heritage at Risk and Protection* (RESTART, n.d.), funded through the University's *Alma CaReS–Climate Change, Resilience, Sustainability* programme, launched in response to the 2023 floods in Emilia-Romagna. Both projects adopt a participatory, cross-sectoral approach to cultural heritage management, emphasising interdisciplinary collaboration and community engagement in the prevention and mitigation of natural and anthropogenic risks. The research team consisted of an art historian, an archaeologist, a conservator, and two experts in science applied to cultural heritage. Each session was attended by three trained communicators from the Volunteer Civil Protection Association R.C. Mistral Ravenna. The classroom teacher acted as co-designer and co-observer, contributing essential pedagogical insights and supporting inclusion, particularly for pupils with special educational needs.

The activity, titled *Occhio al Rischio!* ("Watch Out for Risk!"), consisted of four sessions totalling 10 h. The intervention aimed to introduce children to the concepts of cultural heritage, environmental and anthropogenic risks, and civic responsibility.

The pedagogical approach that guided the design and implementation of *Occhio al Rischio!* was grounded in an integrated model that combines Learning-by-Doing and Play-Based Learning. These pedagogical approaches were operationalised not as abstract references but as concrete principles shaping the structure, sequencing, and facilitation of all educational sessions.

Drawing on John Dewey's conception of learning as an active encounter between the individual and the environment (Dewey, 1938), the activities were designed to situate children within meaningful, real-world problems related to cultural and environmental heritage. Each session therefore included a concrete experiential task—for instance, the manipulation of images or materials related to local heritage, or the exploration of simplified risk scenarios—that invited children to construct knowledge through direct engagement rather than passive reception.

The pedagogical design was further structured according to David Kolb's experiential learning cycle (Kolb, 1984). The sequence of activities followed the four stages of the model:

- Concrete experience was introduced through hands-on exploration and playful simulations;
- Reflective observation was supported through guided group discussions facilitated by the teacher and civil protection communicators;
- Abstract conceptualisation emerged as children collectively interpreted their observations, identifying connections between heritage, vulnerability, and risk;
- Active experimentation occurred through collaborative tasks and games that required applying newly formed understandings to solve problems or interpret new scenarios.

This cyclical organisation provided a coherent scaffold for students' cognitive and metacognitive development throughout the intervention.

Donald Schön's notion of the reflective practitioner (Schön, 1987) informed the facilitation style adopted by both researchers and the classroom teacher. Reflection-in-action was encouraged not only among adults—as a tool for adjusting the activities in real time—

but also among pupils, who were prompted to articulate their reasoning, question their assumptions, and refine their interpretations as they progressed through the tasks.

Play-Based Learning constituted an equally essential methodological pillar. Complex heritage- and risk-related concepts were introduced through structured symbolic play, role-play scenarios, and cooperative games. Inspired by the developmental theories of Piaget (1962) and Vygotsky (1978), the activities were designed to activate children's capacity for symbolic representation, social negotiation, and problem-solving. Group-based play created opportunities for children to operate within their Zone of Proximal Development, with the teacher providing scaffolding that supported participation, especially for pupils with diverse learning needs.

Additionally, Mitch Resnick's framework for creative learning (Resnick, 2017) informed the emphasis on open-ended exploration, peer collaboration, and iterative problem-solving. Through playful challenges—such as constructing protective strategies for heritage items or interpreting risk narratives—children were encouraged to cultivate curiosity, agency, and sustained engagement with civic and scientific ideas.

By integrating these methodological approaches—originating largely from science education—the intervention adapted established experiential and play-based models to the domain of heritage and civic education. This cross-disciplinary operationalisation not only structured the design of the activities but also guided the collection and interpretation of observational data, ensuring coherence between theoretical foundations and empirical practice.

The educational activities were supported by a set of materials designed to facilitate concrete engagement with both cultural heritage and risk-related concepts. These included visual and tactile representations of heritage items, risk cards and scenario prompts, structured worksheets, and simple props used in play-based simulations. Researchers and civil protection communicators also used observation grids to document children's responses throughout the sessions.

Four non-participant structured observations (10 h) were conducted by researchers using a shared protocol focusing on engagement, collaboration, reasoning, and references to risk or heritage. Additional insights were provided by the teacher's reflective notes, children's artefacts (drawings and short written outputs), and short anonymous questionnaires completed voluntarily by pupils at the end of the programme. The questionnaires included a small number of open-ended and closed questions aimed at capturing students' perceived learning, emotional responses, and reflections on risk and heritage. Children's drawings and written productions were analysed as visual and textual evidence of understanding, engagement, and meaning-making. Data analysis followed a qualitative content analysis approach (Schreier, 2012). A category system was developed through a combined deductive–inductive process. Initial coding dimensions were defined deductively based on the study's educational framework and observation protocol (e.g., engagement, collaboration, reasoning, references to heritage and risk). These categories were then refined inductively through iterative reading of the observational notes, pupils' artefacts, and questionnaire responses, allowing additional themes related to emotional involvement, sense of responsibility, and perceived learning to emerge. Coding was conducted through repeated comparison across data sources to identify recurring patterns and ensure consistency in category interpretation.

Ethical approval was granted by the school, and informed consent was obtained from parents or guardians. No video or audio recordings were made, all data were anonymised, and participation was voluntary. The class teacher ensured that all activities were developmentally appropriate and inclusive.

3. Results

Across all sessions, children appeared to develop a progressively more articulated understanding of natural and anthropogenic risks, with clear evidence of concept acquisition. In the first session, these concepts were introduced through guided play and visual prompts derived from the *Io Non Rischio 365* national awareness campaign promoted by the Italian Civil Protection. This activity was designed according to established principles of play-based learning, which use structured, goal-oriented play to support children's reasoning about unfamiliar scenarios and enhance engagement with complex concepts (Piaget, 1962; Resnick, 2017; Vygotsky, 1978). Children analysed images depicting safe and unsafe situations, discussed the risks represented, and collectively identified appropriate preventive behaviours. The Emergency Kit Game further supported the consolidation of risk-related knowledge. As a simplified decision-making scenario, the exercise required children to translate abstract preparedness concepts into concrete choices, consistent with experiential learning approaches emphasising action-based reasoning (Kolb, 1984). Most pupils prioritised basic emergency necessities such as water, a flashlight, or medications. At the same time, several children also chose objects with personal or emotional value (e.g., a stuffed animal, a parent's perfume), demonstrating a nuanced understanding of what they considered important in stressful situations. Written responses from the final questionnaires further confirmed this learning. As one pupil reported, "I learned what I should put in the emergency backpack," while another wrote, "I understood what I need to take if I have to leave home during a flood" (translated from Italian).

All sessions provided multiple opportunities for the development of observational, collaborative, and problem-solving skills. The *tableau vivant* activity—where children recreated artworks using their bodies, costumes, and staged poses—offered a notable example. This practice is widely recognised in heritage and arts education for its capacity to promote embodied observation, interpretation, and cooperative decision-making (Cometti & Matteucci, 2015; Champman, 2018; Dewey, 1934; Eisner, 2002; Sasanelli et al., 2024). Pupils reconstructed the imperial processions from the mosaics of San Vitale (Justinian, Theodora, and their entourages). Preparation involved examining the mosaics on the interactive whiteboard, identifying compositional features, describing details aloud, and assigning specific roles within the group. During the activity, children demonstrated increasing visual attention, capacity to describe visual elements, and collaborative negotiation as they coordinated poses and adapted staging solutions. The social dimension of the experience was also reflected in pupils' feedback. As one child reported, "Working as a team was the most exciting part" (translated from Italian).

Similarly, in the archaeology workshop, pupils participated in hands-on tasks such as recognising archaeological tools, attributing ceramic fragments to hypothetical whole objects, and assembling jigsaw puzzles of fragmented monuments. These activities reflect approaches increasingly adopted in international heritage education, where archaeology functions as an accessible entry point for understanding material culture, stratification, and landscape change (Branchesi, 2007; Trškan & Bezjak, 2020). These activities suggested the development of observational reasoning. Children also displayed an increasing familiarity with local cultural heritage, recognising monuments and artworks of Ravenna and placing them within a simplified historical framework presented during the lesson. Pupils' written responses further confirmed this understanding. As one child explained, the aim was "To better understand how people lived a long time ago" (translated from Italian).

Awareness of heritage at risk was further developed during the triage simulation in the final session. In this activity, children recovered mock cultural objects "affected" by simulated flood damage in the school garden. The structure of the exercise drew on simplified versions of established emergency procedures for movable cultural heritage

(Italian Ministry of Culture, 2015; Tandon, 2018a, 2018b), adapted to ensure accessibility for early learners. Under guidance, they transported the items to a designated area, checked their presence against an inventory list, assigned priority levels for intervention using a simplified triage framework, completed illustrated handling sheets, gently cleaned and stabilised the objects, and finally packaged and labelled them for temporary storage.

Across these steps, children generally showed attentiveness, care, and precision, as well as an ability to follow multi-step procedures. This emerging understanding was also reflected in the completed triage sheets, where many pupils explicitly marked priority levels (e.g., "urgent" or "save first") and provided simple written justifications for their choices. Several pupils commented spontaneously on the importance of protecting artworks in emergency contexts, with statements such as: "If I see a work of art in danger, now I know it must be saved." These remarks illustrate the development of a basic understanding of conservation processes and of the responsibilities associated with safeguarding cultural heritage during emergencies. Visual artefacts provided additional evidence of meaning-making processes. Children's drawings produced after the activity provided further evidence of understanding. Many representations depicted groups of pupils collaboratively recovering objects, cleaning them from mud or water, and placing them in boxes for protection. These visual elements suggest that children had internalised both the procedural sequence of the triage activity and its collaborative and protective dimensions.

4. Discussion

The findings of this study suggest that children can engage meaningfully with cultural heritage and disaster risk reduction (DRR) when these domains are presented through experiential, play-based, and participatory methodologies. The activities implemented across the four sessions supported cognitive, emotional, and collaborative learning processes, indicating that primary school may be able to engage with complex concepts—such as risk awareness, heritage stewardship, and emergency procedures—when these are mediated through developmentally appropriate, hands-on experiences. The results corroborate existing research on experiential and inquiry-driven learning (Dewey, 1938; Kolb, 1984; Vygotsky, 1978) and extend these insights to the largely unexplored intersection of heritage education and DRR.

A first key contribution concerns children's ability to internalise core DRR concepts. Through guided play and structured decision-making tasks such as the Emergency Kit Game, pupils demonstrated not only comprehension of safe behaviours but also the capacity to negotiate choices collectively. This aligns with previous DRR education studies showing that child-centred and participatory activities enhance hazard understanding and preparedness (Gabrielli & Fregola, 2021; Ronan & Towers, 2014; Sigamani et al., 2023). The present findings, however, introduce an additional dimension: children's reflections were not limited to personal safety but extended to the protection of cultural heritage, a topic almost entirely absent from international DRR education frameworks.

The learning processes observed also point to the importance of emotional engagement. Children's spontaneous recall of the 2023 Emilia–Romagna floods and their tendency to include emotionally meaningful objects in the emergency kit highlight how affective and cognitive dimensions are intertwined in childhood learning. This supports research in affective neuroscience and educational psychology indicating that emotionally charged experiences enhance meaning-making and long-term retention (Immordino-Yang & Damasio, 2007). These findings suggest that DRR education may benefit from integrating emotional and autobiographical components to foster deeper understanding and resilience.

A second major contribution emerges from the heritage-focused activities. The *tableau vivant* and archaeology workshops provided opportunities for observational, interpretive,

and collaborative learning. Children developed visual literacy skills, negotiated roles, and articulated increasingly sophisticated descriptions of artworks and archaeological evidence. These outcomes reflect the potential of heritage-based pedagogies to support transversal competencies such as critical thinking, communication, and cultural awareness (Hackett et al., 2020; Hooper-Greenhill, 2007). Notably, the activities helped children situate themselves within local historical narratives, reinforcing the idea that heritage education can cultivate belonging, identity, and civic consciousness from early childhood.

The most innovative component of the project—the cultural heritage triage simulation—revealed that children can meaningfully participate in simplified conservation tasks when provided with adequate scaffolding. Pupils followed multi-step procedures, used illustrated handling sheets, and applied prioritisation criteria to classify objects. Their spontaneous comments about "saving" artworks indicate an emerging ethical framework around cultural heritage protection. This is a particularly significant finding given the almost complete absence of children from research on heritage at risk, which traditionally focuses on professional, institutional, or community-based actors (Cross & Giblin, 2023; Fontanella Pisa et al., 2025; Labadi, 2022). The present study offers preliminary empirical indications that children can be conceptualised as potential contributors within heritage resilience strategies, not only as future citizens but as active learners capable of engaging with heritage protection in meaningful ways.

In relation to the double gap identified in the introduction, these findings may offer a first empirical response on two levels. First, they show that children can engage with DRR not only in terms of personal and household preparedness, as emphasised in existing child-focused DRR education, but also in relation to the protection of cultural heritage as a shared community resource. Second, they demonstrate that cultural heritage—through artworks, monuments, and local historical narratives—can function as a powerful pedagogical mediator for DRR, deepening children's sense of belonging and responsibility. In this way, the study begins to bridge the disconnection between heritage–DRR research, which rarely addresses children, and children–DRR research, which has thus far overlooked heritage.

Taken together, these findings suggest that integrating cultural heritage with DRR offers a promising avenue for expanding the scope of resilience education. Heritage acts as a powerful mediator for engagement, contextualising risk within familiar cultural landscapes and enabling children to connect abstract DRR principles with concrete places, memories, and values. This contributes to a broader understanding of resilience-building that includes cultural continuity and identity as key components—a perspective increasingly recognised in heritage studies (UCLG, 2020; UNESCO, 2021) but rarely operationalised in educational settings. This perspective is consistent with recent international reports highlighting the need for active learning and enhanced resilience-building approaches to address increasingly complex and unpredictable risk environments (UNDRR, 2024).

A further contribution of this study emerges from the qualitative feedback gathered through observations, informal discussions, and children's spontaneous comments during and after the activities. While not collected through formal questionnaires, these feedback moments provide valuable insight into children's perceptions, learning processes, and emotional engagement, offering an additional lens through which to interpret the educational impact of the intervention.

Children's spontaneous remarks suggest a meaningful internalisation of DRR concepts. Expressions of concern for family safety, curiosity about the roles of Civil Protection volunteers and conservators, and the ability to identify risks and propose mitigation strategies indicate that children were not merely passive recipients of information but actively engaged in interpreting and applying new knowledge. Statements such as "*I would also put my stuffed animal in the backpack because it makes me feel safe*" or "*If I see a work of art*

in danger, now I know it must be saved" reveal how cognitive understanding and emotional needs were intertwined, particularly in relation to preparedness and care.

The interaction with Civil Protection volunteers appeared to play a key role in reinforcing a sense of responsibility and community belonging, strengthening the link between individual action and collective safety. Likewise, the cultural heritage triage activity—described by children as "complicated but fun"—was perceived as both challenging and meaningful, suggesting that realism and task authenticity can enhance engagement even in early childhood settings.

Importantly, these children's voices should not be interpreted merely as expressions of enthusiasm. Rather, they constitute qualitative indicators of emerging agency, ethical awareness, and civic orientation. The ability to articulate the value of heritage care as something "to remember" and "to pass on to future generations" points to the early development of historical consciousness and civic responsibility, aligning with the broader aims of both heritage education and DRR education.

Finally, children's appreciation for practical and symbolic activities—such as assembling puzzles or "cleaning" artworks from mud—confirms the pedagogical relevance of Learning-by-Doing and Play-Based Learning. These approaches enabled children to engage with abstract concepts through action, symbolism, and cooperation, fostering transversal skills such as empathy, collaboration, critical reflection, and self-efficacy. In this sense, the notion of "awareness," frequently evoked during the activities as the ability "to notice what is happening around us," effectively encapsulates the broader educational outcome: nurturing responsibility, belonging, and resilience as foundational components of active citizenship.

5. Conclusions

This study explored how cultural heritage can function as a mediator for disaster risk reduction (DRR) education in early childhood, addressing an overlooked intersection between heritage–DRR research and child-focused DRR education. In relation to the research questions, the findings suggest that heritage-based experiential and play-based activities may support children's understanding of cultural heritage vulnerability and disaster risk (RQ1). At the same time, observational data and pupils' feedback indicate high levels of engagement, emotional involvement, and emerging reflections related to care, responsibility, and civic awareness (RQ2). By situating risk awareness within familiar cultural landscapes, the intervention appeared to help children connect abstract DRR principles to concrete places, memories, and values, thereby fostering early forms of responsibility toward both community safety and cultural stewardship.

An additional element emerging from this study concerns the interdisciplinary nature of both the design and implementation of the educational pathway. The development of the activities was made possible through the integration of diverse disciplinary competences, including archaeology, art history, conservation, and scientific approaches applied to cultural heritage, combined with expertise in risk assessment and disaster preparedness. This interdisciplinary framework was further enriched by the operational knowledge of civil protection volunteers and by the pedagogical mediation provided by the classroom teacher.

In this sense, the roles involved in the project were not limited to single disciplinary perspectives but reflected sustained engagement with the interconnected themes of cultural heritage, risk prevention, and education. This convergence of competences constituted a key condition for addressing complex topics—such as heritage triage and emergency response—within an educational setting appropriate for early childhood. Rather than representing an element of exceptionality, this highlights the intrinsic complexity of heritage-based DRR

education and the importance of collaborative, cross-sectoral approaches in its effective implementation.

Several limitations must be acknowledged. The study involved a single class of 18 pupils in a specific local context, and the qualitative, exploratory design does not aim for statistical generalisation. At the same time, the intervention was implemented in a real-world context directly affected by the 2023 Emilia-Romagna floods, enhancing the ecological validity of the study and grounding the learning experience in a locally meaningful risk scenario.

The short duration of the intervention also limits the ability to assess the long-term retention of knowledge or the durability of behavioural change. Broader studies are therefore needed to examine the transferability and sustainability of the proposed educational model. Future research could incorporate longitudinal approaches, mixed-methods designs, or comparative studies across different regions, age groups, and cultural settings.

It is noteworthy that a second implementation of *Occhio al Rischio*! has recently been completed with another primary school class, including pupils with diverse learning needs. Although data from this edition are not included in the present analysis, its successful completion confirms the feasibility, adaptability, and inclusiveness of the model. This additional experience opens valuable opportunities for future comparative and iterative research aimed at refining the pedagogical framework and assessing its broader applicability.

Overall, this study contributes to an emerging area of inquiry at the intersection of heritage education and DRR, a field in which children have been largely overlooked. The results suggest that cultural heritage may represent a valuable and underutilised resource for resilience education, supporting early forms of risk awareness, cultural responsibility, and active citizenship. Although the present case focused on flood risk, the educational structure of *Occhio al Rischio!* was designed as a flexible and context-responsive framework, based on locally meaningful heritage elements and simplified risk scenarios. This adaptability supports the potential transferability of the model to educational settings exposed to different territorial risks (e.g., seismic, hydrogeological, or environmental hazards). In this sense, heritage-based DRR education represents a promising direction for developing innovative pedagogical strategies capable of connecting cultural heritage, risk awareness, and civic engagement from the earliest stages of schooling.

Author Contributions: Conceptualization, S.F.; methodology, S.F.; validation, M.V.; formal analysis, S.F.; investigation, S.F., A.C., I.F., G.S. and M.V.; resources, M.V.; data curation, S.F., A.C., I.F. and G.S.; writing—original draft preparation, S.F., A.C., I.F. and G.S.; writing—review and editing, M.V. and S.F.; visualization, M.V.; supervision, M.V.; project administration, M.V.; funding acquisition, M.V. All authors have read and agreed to the published version of the manuscript.

Funding: The project is funded by the European Union—NextGenerationEU under the National Recovery and Resilience Plan (NRRP)—Mission 4 Education and research—Component 2 From research to business—Investment 1.3, Notice D.D. 341 of 15/03/2022, entitled: Cultural Heritage Active Innovation for Sustainable Society, proposal code PE0000020—CUPJ33C22002850006—duration until 28.02.2026. This research was also supported by the RESTART Project (Resilience and Territorial Development for At-Risk Heritage and Protection) within the Alma CaReS Initiative (Climate Change, Resilience, Sustainability), funded by Alma Mater Studiorum–University of Bologna through the Italian 5x1000 tax donation campaign.

Institutional Review Board Statement: Ethical review and approval were waived for this study. The educational workshops described in this study involved minors; however, no personal data, identifiable in-formation, or sensitive research data were collected from participants. The project team was contacted directly by the school, which voluntarily joined the initiative and autonomously managed the communication with parents or legal guardians and the related consent procedures. The activities were strictly educational and conducted in compliance with institutional guidelines

for outreach in schools. Therefore, informed consent for participation in a re-search study was not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Acknowledgments: The authors would like to express their sincere gratitude to the Municipality of Ravenna for including "*Occhio al Rischio*!" in the *Piano di Arricchimento Formativo del Territorio (PAFT) 2024–2025* and for its renewal for the 2025–2026 edition. Special thanks are also due to the Ettore Burioli School of Savio (Ravenna), and in particular to Elisa Cristofori, for choosing our initiative as an integrative project within the school curriculum.

Conflicts of Interest: The authors declare no conflicts of interest.

References

Agbugba, I. K., Mehren, R., & Eze, E. (2025). Transforming youth engagement in disaster risk management and heritage conservation through adapting the concept of brain re-engineering and reimagination. *Discover Sustainability*, *6*, 1067. [CrossRef]

Amri, A., Haynes, K., Bird, D. K., & Ronan, K. (2017). Bridging the divide between studies on disaster risk reduction education and child-centred disaster risk reduction: A critical review. *Children's Geographies*, *16*(3), 239–251. [CrossRef]

Branchesi, L. (2007). *Heritage education for Europe: Outcomes and perspectives*. Armando.

Champman, N. (2018). Tableau vivant: A living picture. *Journal of Performance Studies*, *24*(3), 45–62.

CHANGES–Cultural Heritage Active Innovation for Next-Gen Sustainable Society. (n.d.). Available online: https://www.fondazionechanges.org/ (accessed on 18 February 2026).

Chatterjee, H. J., & Hannan, L. (2015). *Engaging the senses: Object-based learning in higher education*. Routledge.

Cometti, J. P., & Matteucci, G. (2015). *Introduzione all'estetica*. UTET Università.

Comune di Ravenna. (n.d.). *PAFT Piano Arricchimento Formativo del Territorio*. Available online: https://comune.ravenna.it/amministrazione/documenti-e-dati/documento-tecnico-di-supporto/paft-piano-arricchimento-formativo-del-territorio-a-s-2025-2026/ (accessed on 31 January 2026).

Council of Europe. (2005). *Framework convention on the value of cultural heritage for society (faro convention)*. Available online: https://rm.coe.int/1680083746 (accessed on 26 February 2026).

Cross, C., & Giblin, J. (Eds.). (2023). *Critical approaches to heritage for development*. Routledge.

Dewey, J. (1934). *Art as experience*. Perigee Books.

Dewey, J. (1938). *Experience and education*. Macmillan.

Eisner, E. W. (2002). *The arts and the creation of mind*. Yale University Press.

European Commission. (2015). *CUIDAR–Cultures of disaster resilience among children and young people (Project ID 653753)*. Available online: https://cordis.europa.eu/project/id/653753 (accessed on 31 January 2026).

Fiorentino, S., & Vandini, M. (2024). Resilience and sustainable territorial development: Safeguarding cultural heritage at risk for promoting awareness and cohesiveness among next-generation society. *Sustainability*, *16*(24), 10968. [CrossRef]

Fontanella Pisa, P., Romagnoli, F., & Shanko, A. (2025). Framing resilience: The role of cultural heritage in community responses to multi-hazard risks. *International Journal of Disaster Risk Reduction*, *130*, 105876. [CrossRef]

Gabrielli, S., & Fregola, C. (2021). How can teachers promote resilience in schools? In F. Farnaz Arefian, J. Ryser, A. Hopkins, & J. Mackee (Eds.), *Historic cities in the face of disasters* (pp. 479–489). Springer. [CrossRef]

GADRRRES. (2022). *Comprehensive school safety framework 2022–2030*. Available online: https://gadrrres.net/wp-content/uploads/2022/08/Comprehensive-School-Safety-Framework-2022-2030.pdf (accessed on 26 February 2026).

Giuliani, F., De Paoli, R. G., & Di Miceli, E. (2021). A risk-reduction framework for urban cultural heritage: A comparative study on Italian historic centres. *Journal of Cultural Heritage Management and Sustainable Development*, *11*(4), 499–515. [CrossRef]

Hackett, A., Holmes, R., & MacRae, C. (Eds.). (2020). *Working with young children in museums. Weaving theory and practice*. Routledge. [CrossRef]

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

ICCROM. (2019). *First aid to cultural heritage in times of crisis (FAR programme)*. ICCROM.

Immordino-Yang, M. H., & Damasio, A. (2007). We feel, therefore we learn: The relevance of affective and social neuroscience to education. *Mind, Brain, and Education*, *1*(1), 3–10. [CrossRef]

Io Non Rischio–Dipartimento della Protezione Civile. (n.d.). *Buone pratiche di protezione civile*. Available online: https://iononrischio.protezionecivile.it/it/ (accessed on 31 January 2026).

Italian Ministry of Culture. (2015). *Directive for the protection of cultural heritage in emergencies*. Available online: https://www.indicenormativa.it/sites/default/files/Circ.15_2015.pdf (accessed on 26 February 2026).

Kamal, M. (2008). *Rebuilding lives after the tsunami: The children's road to recovery*. Save the Children International.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.

Labadi, S. (2022). *Rethinking heritage for sustainable development*. UCL Press. [CrossRef]

Labadi, S., Giliberto, F., Rosetti, I., Shetabi, L., & Yıldırım, E. (2021). *Heritage and the sustainable development goals: Policy guidance for heritage and development actors*. ICOMOS. Available online: https://publ.icomos.org/publicomos/jlbSai?html=Bur&base=technica&ref=43200&file=1880.pdf&path=ICOMOS_SDGPG_2022%20-%20FINAL3.pdf (accessed on 31 January 2026).

Piaget, J. (1962). *Play, dreams and imitation in childhood*. Norton.

Resnick, M. (2017). *Lifelong kindergarten: Cultivating creativity through projects, passion, peers, and play*. MIT Press.

RESTART–Resilience and Territorial Development: Heritage at Risk and Protection. (n.d.). Available online: https://site.unibo.it/resilienza-patrimonio-culturale/en (accessed on 31 January 2026).

Ronan, K. R., & Towers, B. (2014). Systems education for a sustainable planet: Preparing children for natural disasters. *Systems*, *2*(1), 1–23. [CrossRef]

Sasanelli, L. D., Baldassarre, M., & Ranieri, G. (2024). Includere attraverso i tableaux vivants: Un percorso fra arte, espressività e corporeità. *IUL Research. Open Journal of IUL University*, *10*(5), 87–101.

Save the Children. (2015). *Child-led disaster risk reduction: Practical guide (Part I)*. Available online: https://resourcecentre.savethechildren.net (accessed on 31 January 2026).

Schön, D. A. (1987). *The reflective practitioner*. Basic Books.

Schreier, M. (2012). *Qualitative content analysis in practice*. SAGE.

Sigamani, P., Kumar, S., Raka, K., Balu, I., & Udhayakumar, P. (Eds.). (2023). *Child centric disaster. Risk reduction, priorities, preparedness and resilience*. Bloomsbury India.

SIRIUS–Management Strategies for Cultural Heritage at Risk. (n.d.). Available online: https://site.unibo.it/patrimonioculturalearischio/en (accessed on 31 January 2026).

Stake, R. (1995). *The art of case study research*. SAGE.

Tandon, A. (2018a). *First aid to cultural heritage in times of crisis. 1: Handbook*. ICCROM & Prince Claus Fund.

Tandon, A. (2018b). *First aid to cultural heritage in times of crisis. 2: Toolkit*. ICCROM & Prince Claus Fund.

Trškan, D., & Bezjak, Š. (2020). *Archaeological heritage and education: An international perspective on history education*. Slovenian National Commission for UNESCO. Available online: https://repozitorij.uni-lj.si/IzpisGradiva.php?id=166890 (accessed on 31 January 2026).

UCLG–United Cities and Local Governments. (2020). *Culture in the sustainable development goals: A guide for local action*. Available online: https://www.uclg.org/sites/default/files/culture_in_the_sdgs.pdf (accessed on 31 January 2026).

UNESCO. (2015). *Transforming our world: The 2030 Agenda for sustainable development*. United Nations. Available online: https://docs.un.org/en/A/RES/70/1 (accessed on 31 January 2026).

UNESCO. (2021). *Reimagining our futures together: A new social contract for education*. UNESCO Publishing.

UNESCO. (2024). *Greening curriculum guidance: Teaching and learning for climate action*. UNESCO.

UNICEF. (2020). *Education in emergencies: Core commitments for children*. UNICEF.

United Nations Office for Disaster Risk Reduction (UNDRR). (2019). *Words into action: Engaging children and youth in disaster risk reduction and resilience building*. United Nations. Available online: https://www.undrr.org/words-into-action/engaging-children-and-youth-disaster-risk-reduction-and-resilience-building (accessed on 31 January 2026).

United Nations Office for Disaster Risk Reduction (UNDRR). (2024). *Forensic insights for future resilience: Learning from past disasters*. UNDRR.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

West, A., & Theis, J. (2007). *The participation of children and young people in emergencies*. UNICEF.

Zhang, Y., Ikiz Kaya, D., van Wesemael, P., & Colenbrander, B. J. (2024). Youth participation in cultural heritage management: A conceptual framework. *International Journal of Heritage Studies*, *30*(1), 56–80. [CrossRef]