

11 Reading, play, and critical engagement with cultural heritage: Associating children with Orientalist paintings through an interactive picturebook

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Introduction

This study focuses on the potential of a picturebook prototype that is tailor-made for the Suna and İnan Kırac Foundation's Orientalist Painting Collection permanent exhibit in the Pera Museum, in Istanbul, to nurture children's interaction with artworks in a museum. Museums, one of the primary institutions preserving and displaying cultural heritage artefacts, have been crucial informal learning settings studied by the Human-Computer Interaction community due to the opportunities to test and experiment with different interaction types, technologies, and devices in a public environment with a diverse audience (Hornecker and Ciolfi 2019). Inclusive experimentation with museum content needs careful consideration of several aspects in order to appeal to each visitor in an eloquent and fulfilling way. Smith (2006, p. 30) conceptualises power dynamics in cultural heritage studies through "Authorised Heritage Discourse" (AHD) that signifies a single hegemonic voice valuing particular identities while alienating others. Critical perspectives in museum and heritage studies, such as New Museology or critical heritage studies, challenge professionals in museums to review their discourses, decolonise their collections and create accessible, inclusive, and dialogic places aiming for social change (Marstine 2006, Witcomb and Buckley 2013). Similarly, according to Galani *et al.* (2020), digitisation in museums and cultural heritage institutions goes beyond using an assemblage of technologies; it is a dynamic process of negotiations of self and alterity where constant recreations of reciprocal relationships with communities through dialogic practices occur. Digital technologies concerning the plurality of cultural heritages offer material, embodied, and aesthetic experiences that challenge the authoritative narration via polyvocal and participatory features (Schofield *et al.* 2019, Claisse *et al.* 2020, Galani *et al.* 2020).

Despite the cultural splendour that a museum collection aims to offer, children's perspectives can easily get lost in the complexity of these

presentations. Smith (2006, p. 26) explains that the authorised heritage discourses consider heritage properties as valuable assets to preserve for future generations. This concept of heritage assigns a passive role to children who are expected to take patrimonial responsibilities in the future by undermining children's agency in the present time. However, studies in childhood theories, such as Gubar's (2013, p. 453) "kinship model", reject the idea of children as "becoming" or "adults in the making". Accordingly, Gubar's idea positions them as "beings" having differences yet kinship to adults' perspectives; therefore, as coproducers of cultural texts with them.

Children's interactions with cultural heritage objects and artworks vary according to the museum types and prescribed museum education programs. While studies on child-technology interactions in science and maritime museums (Beheshti *et al.* 2019, Hershman *et al.* 2018, Hogan *et al.* 2017, Long *et al.* 2019) are more common, there are studies on facilitating children's learning through interactive technologies in art and history museums as well (Thom-Santelli *et al.* 2006, Yiannoutsou 2009, Apostolellis and Bowman 2015, Roussou and Katifori 2018, Vayanou *et al.* 2019). Art museums provide child-adult/peer interactions (e.g., storytelling activities), child-environment interactions (e.g., hands-on activities), and combinations thereof (e.g., playful and multisensory experiments) (Andre *et al.* 2017). As such, the technologies in art museums often take the form of mobile museum guides, games, and interactive installations and apply different museum education approaches (namely Active Learning, Contextual Model of Learning, etc.) as it is suitable to their institution (Thom-Santelli *et al.* 2006, Apostolellis and Bowman 2015, Hornecker and Ciolfi 2019). In some cases, art museums employ technology that integrates participatory design aspects to create an art education program for children (Roussou *et al.* 2007).

Museums use diverse approaches to facilitate children's interactions with an exhibit through mobility (Thom-Santelli *et al.* 2006), playfulness (Yiannoutsou 2009), and active participation (Roussou *et al.* 2007), and most interactions are carried out through storytelling (Roussou and Katifori 2018; Vayanou *et al.* 2019). Furthermore, these studies reveal that significant design elements of tools such as games are attuned to education approaches through active learning (Apostolellis and Bowman 2015). Unfortunately, few of the studies we reviewed discuss how they helped facilitate interactions that would clearly explain art terminology, employ narratives in such a way that the artwork would be memorable, or discuss the curation process of similar works, which would give a historical context. To rectify this oversight, we have addressed these frequently disregarded aspects through a case study of our own.

These issues led us to draw knowledge from picturebook studies where children's engagements are built on multimodal narratives, material, aesthetic, and cultural explorations that may be beneficial in specialised contexts. A picturebook, mainly "the interaction between written text and image and where both have been created with a conscious aesthetic

intention” (Arizpe and Styles 2016), is often the earliest object to introduce artistic sensibilities and multimodal literacies to children. Scrutinising the illustrations in picturebooks is comparable to observing the artworks as both evoke aesthetic sensations through their affordances. Thus, picturebook interactions offer a degree of intimacy for children through their handling in close proximity to the child’s body, thus triggering tactile explorations (Nodelman 2018). Since material interactions at times heighten the multimodal reading opportunities of picturebooks, this study finds merit in using the picturebook’s capacity to narrate and facilitate hands-on and bodily engagement to encourage art appreciation at museums. Thus, according to the findings of this case study, picturebooks may also be used for further surface interactions supported by (simple to complex) technologies.

To examine how this interplay of Picturebook studies and HCI benefits museums, we have chosen to study Pera Museum due to its extensive experience in children’s learning programs and eagerness to blend low- and high-technology interactions in exhibitions. The corresponding collection that displays Orientalist paintings is challenging for children since many of the themes are unfamiliar to them, such as the historical context, terms, traditions from earlier eras, people’s occupations, hierarchical roles, and a regime type different from today. Based on the first author’s experience as a museum educator for this collection, we decided on creating a narrative background supported with action questions to transform these subtle but culturally loaded themes into enjoyable ones. Our observations of children’s reflections on their experience and use of picturebooks helped define the elements that would support interactive museum learning for the Orientalist Painting Collection. These elements include historic, multi-cultural context supported with narrative, aesthetic, and cultural engagements with the artworks.

Previous works

To support dialogues in museums and cultural heritage institutions, Galani *et al.* (2020) suggest practices focusing on the *polyvocality* achieved through inviting visitors to construct multiple histories and *civic listening* by reflecting on challenging sensitivities with openness. Similarly, Claisse *et al.* (2020) create polyvocal, dialogic, and spatio-temporal interactions in a house museum by underlining key aspects of the materiality of the tools, the aesthetic experience of viewing the craftsmanship, the value of individual stories, rather than the AHDs and constructivist heritaget. Similarly, Schofield *et al.* (2019, p. 4) assert that design for cultural heritage should focus on *plural heritages* signifying the encouragement of individuals and communities’ stories and *future-oriented* practices resisting prescribed methods of building “past” and memories. They designed cultural probes for participants to discuss Istanbul’s Historical Peninsula (e.g., Theodosian Walls), a UNESCO World Heritage Site, and they asked participants to first imagine giving a tour of the place to

someone who passed away, point out areas where the walls witnessed conflicts, write a letter to the walls, and create a flipbook. Hence, sensorial, embodied, and open-ended activities help participants reflect on the past while covering different perspectives on the same cultural heritage assets in Istanbul.

Since Pera Museum is neighbouring the Historical Peninsula, the cultural probes explained by Schofield *et al.* are significant in this study. Embodied activities centred on participants' creative responses can address adults and children as coproducers of cultural heritage in Istanbul. This section presents a broad cross-section of previous works under the following categories: we critically introduce how the museum context augmented by interactive elements enriches children's engagement, then we introduce the technological possibilities that come with interactive book formats. Lastly, we give an overview of children's experiences with interactive books and children's interactive engagement with artworks supported by certain activities in the museum space.

Interactive technologies and children's engagements in museums: A critical stance

Organising interactive events in museums for child visitors poses many challenges based on their ages and education. Science, technology, engineering, maths, and sometimes arts disciplines are integrated into the education of older children and teenagers. For instance, in science museums children try haptic devices to learn about the electric circuit related to the exhibit (Beheshti *et al.* 2019), and they engage with stories presented through a multimodal installation (auditory, projected graphics, thermal and haptic wall), which enhance their curiosity in the story and delight them through the physical engagements (Hogan *et al.* 2017). Gamification and storytelling are popular tools incorporating mobile devices, as various gaming elements (clues, treasure hunt, quiz, collection, simulation, and timeout strategy) are fused with storytelling elements (plots based on adventure or emotions). Studies (Yiannoutsou *et al.* 2009, Thom-Santelli *et al.* 2006) on mobile games and hand-held systems in an art museum context show that playing team-based games designed with a socio-constructive learning approach in museums encouraged children to view the artworks attentively as they communicated with their peers on artworks. The playful storytelling elements in these studies provided a trajectory compiled of different interactions that benefit and support our case study.

Although these interactions facilitate gaining familiarity with the artworks, the increased engagement with the technology on offer may overshadow the museum experience and create several challenges. To give an example, Hornecker and Ciolfi (2019) underline the popularity of these treasure-hunt games but mention at the same time the danger of focusing on achieving the tasks instead of reflecting on the content. Similarly, research on children's playing C-Olive, a collaborative museum game, suggests

that playing a game about art in the museum space fosters a “play mode” where children merely focus on gaining high scores and not concentrating on the art (Apostolellis and Bowman 2015). Although this game is developed according to Falk and Dierking’s *The Contextual Model of Learning* (CML), it addresses children’s context (e.g., motivation and expectations; prior knowledge, interest, and beliefs; choice and control) and socio-cultural context (e.g., within-group sociocultural mediation; facilitated mediation by others) rather than the physical context (e.g., advance organisers and orientation; design; reinforcing events and experiences outside the museum) (Apostolellis and Bowman 2015). They also added that any tool for children should be culturally informed, which implies addressing the children’s background, prior knowledge, and learning (Apostolellis and Bowman 2015). Therefore, offering a suitable scenario in which children reflect on their opinions about the artworks is yet another challenge to creating dialogic space.

Human-Computer Interactions in Museums (Hornecker and Ciolfi 2019) is significant for our study since it presents a diverse range of interaction types supported by different interaction modalities, from stand-alone installations, tangible and digital assemblies, mobile devices to Extended Reality works. Hornecker and Ciolfi (2019) emphasise the necessity of considering the aspects of different types of museums such as their vision, the exhibition’s content and space, curatorship, the audience and learning outcomes when selecting a suitable interaction type or technology. They borrow Jenny Kidd’s term “artistic narrative interpretation” (2018 cited Hornecker and Ciolfi 2019) exemplifying the interactivities evoking the historical and cultural context of the art through the combination of fact and fiction as well as storytelling techniques. Less descriptive and static narratives on artworks challenge the participants’ imagination, evoke their attention, and encourage them to discuss art with their peers (Vayanou *et al.* 2019, Roussou *et al.* 2018).

Picturebook affordances for imagining new interactions

Picturebook affordances such as narration, incorporation of knowledge and facilitating critical, hands-on and bodily engagement are broadly used to counterbalance these challenges since the applications of sociocultural theories to museum environments emphasise “the power of narrative” (Allen 1997) and make museums venues for dialogue between children and artworks. Therefore, in addition to CML, which is also rooted in sociocultural theories, we built on other applications of them in the museum environment (Allen 1997, Piscitelli and Weier 2002) to foster better interactions and provide children with the tools for dialogue on artworks’ content through subtle technological intervention/integration. Piscitelli and Weier (2002) suggest that museum guides should utilise directive (e.g., instructing), non-directive (e.g., encouraging), and scaffolding (e.g., reinforcing, focusing

attention, posing problems, prompting, clarifying, reading, recalling, co-constructing) elements to guide children in art criticism (Piscitelli and Weier 2002). Picturebook interactions theoretically have some parallels with aspects of these interactive behaviours, for instance, picturebook interactions can be based on dialogic reading and have the potential to extend our understanding of artwork on a critical level through scaffolding in the narration. A tool developed from the social interactions with the artworks' content and culture, especially those like Orientalist Painting Collection that presents a challenging and controversial topic in history and art, can offer children entry points to discuss everything from the aesthetic and artistic value of the artworks to its significance in the past or its cultural relevance today. In conveying these sensibilities through creative and inquisitive methods, picturebooks can narrate through malleable material engagements that foster children's interactions with the historic content without dwarfing the original artworks.

Children's material experiences with interactive picturebooks

Traditional picturebooks where only images and text through paper surfaces play a role diverge from HCI-integrated ones. In HCI-related picturebooks, modalities multiply although the tangibility of physical books in reading still retains its importance. Research on the book format (Cesário *et al.* 2016) reveals that children find it preferable to other formats because its physicality allows for bonding with the object due to handling the book and exploring page surface qualities. It also provides autonomy of reading without anyone's help and without any restrictions over the time spent, enabling a pleasant and discreet reading routine (Cesário *et al.* 2016). Touching and especially turning a page can be one of the most important movements in the kinaesthetic repository of reading. Paper as a material has a physical significance for children's engagements. This issue has been revisited by recent research (Sim *et al.* 2016) that compared children's interaction with the prototype played on paper or an iPad, revealing that although the form did not affect their enjoyment, the paper version they played elicited more comments on the aesthetic aspect of the game. Moreover, the increase in the attention to paper crafting tradition that combines low and high technological elements such as Paper mechatronics with Led circuits and circuit stickers encourages a reconsideration of the physical interaction opportunities of a print book (Qi *et al.* 2015; Oh *et al.* 2018). Similarly, "Hello World" is an interactive touch-and-feel book using e-textiles with inserted electronics that react with haptic, audio, and visual feedback to the children's actions. Observations of children's tactile experiences through materials and texture in the story show that their imagination is engaged in a positive way (Moorthy *et al.* 2017). In the "Light it Up" project (Hershman *et al.* 2018), children utilised different paper recording buttons to guide a voice-controlled rocket to go on a mission to

Mars. Children's increased interest highlights the importance of the narrative in using light, a strong abstract concept suitable for this story for various reasons (Hershman *et al.* Hershman 2018). These studies showed us that the materiality of picturebooks and paper is being widely investigated by researchers from diverse disciplines and that these books are not being abandoned for their digital counterparts.

Children's narrative experiences with picturebooks on museums

Museums aim to provide accessible information for children starting with free guidebooks and tailor-made children's books often found in the museum space, its shops and at times in the museum libraries. Conceptually, these resources are closely related to picturebooks (Lechner 1993, Sipe 2001, Nodelman 2018, Yohlin 2012). Lechner (1993) considers picturebooks as "portable art galleries" that go beyond the function of the paintings hanging on the walls since they train children to consider the illustrator's choices, understand a different point of view, recognise compositions and details, grasp the impressions and emotions, and follow the visual storyline. Since picturebooks with or without the art history content are "aesthetic objects" (Sipe 2001), even analysing and questioning the design choices of the artists in these books and reflecting upon them orally or in written format enhance children's creativity and critical thinking (Pantaleo 2017). Sipe (2001) examines picturebooks on art history and categorises them as fictive stories of famous artists, appropriating an artistic style and displaying a museum visit. He asserts that these picturebooks are not just teaching art history to children but liberating them to experiment with different techniques, critique styles, and even take this critical stance further in their cultural life. Similarly, children's reflections on reading picturebooks related to the original artwork in an art institute proved that picturebooks may be regarded to form a threshold to enter the artistic realm while easing the complexity of understanding as well as talking about the artworks as they are often authored, illustrated, and designed in such a way as to create an intimacy for the selected age group (Yohlin 2012). Since children frequently question the protagonists' behaviours in the museum and compare them with their own behaviours, the picturebooks provide critical thinking and a deeper level of engagement with the painting when entwined around a story. Furthermore, children also evaluate the illustrations in the picturebooks with the artworks in terms of reinterpretation and authenticity to further the initial engagement (Yohlin 2012).

Moreover, reading narrative accounts in picturebooks builds empathy in children towards the characters and among the reading group (Kucirkova 2019) and generates familiarity with the complex information just as picturebooks with science themes do (Mantzicopoulos and Patrick 2011). For example, inspired by the socio-cultural theories in museum studies, Hapgood and Palinscar (2002) create a fictional narrative of a scientist

whose notebook for an art museum is presented to children. This way, their meaning-making is mediated by the text with first- and second-hand investigations as follows. The first investigation is to look at the artwork purposefully to find a detail or understand the function of the machine, and the second one is to critically understand the context that scientists and curators envision. They suggest referring to the source of questions directly, using traditions in the scientific community, exemplifying expert reasoning, representing data in different ways, and more importantly creating a fictional narrative to give it a framework (Hapgood and Palinscar 2002).

On the other hand, picturebooks created for museums also articulate physical activities. Reading fiction with less movement helps the reader suspend their disbelief which means the reader's interrogations of things from the character's perspective but not one's own. However, hands-on or bodily movements disrupt this inactive immersion and impact the meaning-making of a work's content energetically. Therefore, books for art museum education can integrate movement, enriching children's experience and cognition in the selected period and setting. Analysis of the interactive aspects of children's nonfiction picturebooks on art history demonstrates that children can benefit from these books in sensorial, hands-on, bodily, and spatial ways (Dinc and Veryeri Alaca 2021). Picturebooks can provide a meaningful sequence among the artefacts through a map and physical activities that can be varied from designing an object inspired by the artefact to acting out the artwork. These picturebooks can engage children in exercising different professions in relation to museums such as curatorship and allow children to unfold the pages to form museum space/walls. Decision-making via stickers or sketching can be some of the many interactions to grasp the curatorial aspects of an exhibition. Hence, a picturebook which is "the cultural artifact" (Kim and Short 2019) supports children's museum learning to develop art appreciation and sustain inquiries on the culture represented in the artworks and surrounding them in real-life experiences with their physical affordances.

Bringing these studies together gives us insights into different engagements with the artworks via picturebook interactions that allow historic, multi-cultural context supported with narrative, aesthetic, and cultural engagements. Whether sensorial, spatial, hands-on, or bodily interactions, the learnings from our case study are numerous. Our picturebook prototype inspired interactions while creating new opportunities to foster children's responses to sophisticated cultural and artistic content. Hence, our study opens up a space for rethinking the polyvocal museum by inviting children for subjective interactions and material exchanges, by not merely utilising concepts but also senses and spaces. In sum, this study investigates engagement types with children via a picturebook prototype tested in a museum, using the elements from picturebooks: historic, multi-cultural context supported with the narrative, welcoming artistic and cultural engagements with the artworks. This work uncovers future potentials of picturebooks for

special collections mediating a specific period in art history with tangible interactions and customised technology integration. It also facilitates the children's experience in the museum setting proposing activities entwined with stories.

Designing a picturebook enhanced with paper circuitry for Pera Museum's Orientalist Painting Collection

Suna and İnan Kıraç Foundation's Orientalist Painting Collection in Pera Museum covers three centuries of Ottoman and European relationships (Pera Museum 2021). Starting in the late 17th century, the Ottoman Empire sent envoys to European countries to develop diplomatic relations and commercial exchanges. This, for instance, introduced the Ottoman fashion to the West and initiated the Westernisation movement in the Ottoman Empire in return. As Ottoman artists studied in the West and Western artists visited Istanbul and served the ambassadors of the Ottoman royal court, this instigated a considerable cultural exchange. Since travel to Eastern countries was becoming quite popular, the emergence of studies in relation to Orientalism inspired the subject matter of numerous art forms such as paintings. The *Intersecting Worlds: Ambassador and Painters* exhibition highlights Ottoman and European relations and the ambassador's art patronage with selected artworks from the Orientalist Painting Collection (Pera Museum 2021). There are more than 30 artworks from the collection on display, some of them being high points of the museum's collection. These artworks are the subject of our study since they reflect the cultural, economic, and artistic life in that period, aiding a comparative look from the past to the present. Rather than focusing on every single work in the collection, we took our cue from the experience and knowledge of the museum educator and first author by focusing on a range of paintings based on the inclinations of child visitors' during general guided tours. We aimed to keep the theme of ambassadors at the centre of our picturebook and emphasised a meaningful path of visiting the artworks in the exhibition with the LED interactions in the picturebook.

Considering all artworks highlighted by the Learning Programs primarily, six artworks were selected based on representing diversity in subjects, their distribution in the exhibition space and their popularity among the public. The first artwork is *The Welcoming of Venetian Balios to Ottoman Lands* (1725) by Jean Baptiste Vanmour and it is a series of paintings narrating the story of the Venetian ambassador Francesco Gritti's arrival to Istanbul to present a letter from the Venetian King to the Ottoman Sultan (Inankur 2014). In some of these paintings, the ambassador accompanied by his regiment is riding his horse to the Topkapı Palace, where he is welcomed with a special performative event called "the sacking the bowl", in which the Jannisary, the court soldiers, are searching for gold in the bowls of rice. Children are helped to identify the ambassador by his unique attire and

position in the space and how to distinguish local and foreign officials from each other. Since being an ambassador is not a common occupation, children often need an explanation for what an ambassador does. They also often query the act of the soldiers, since they cannot see the gold and are not familiar with this type of performance.

Mehmet Said Efendi and his Retinue (1733) by George Engelhardt Schröder depicts the envoy Mehmet Said, who was responsible for collecting monies owed by Sweden but returned home unsuccessful and empty-handed (Renda 2014). This painting is perhaps the one the generic guided tours spend the least time on, as the diplomatic story might be perceived by some as dry, but it is one that could be enlivened with the support of the picturebook reading process. Hence, some of the paintings reflected the social life in Istanbul, including the portrait of *The French Ambassador Comte de Vergennes in Turkish Attire* (1762) painted by Antoine de Favray that illustrates how foreign ambassadors at times dressed in culture-specific attire to depict the fashion and culture of the time (Renda 2014). At times, the sultans would present special caftans called hilat to ambassadors as a gift exchange. These paintings provide a wealth of information for discussions with children that focus on the identity of these figures, foreign or not, through the accessories, the clothes as well as body positionings. *A Scene from the Turkish Harem* (1654) (Figure 11.1) painted by Franz Hermann, Hans Gemminger, and Valentin Muller displays a scene that envisions the entertainment Ottoman women indulge in, a popular artwork



Figure 11.1 A Scene from the Turkish Harem (1654) by Franz Hermann, Hans Gemminger, and Valentin Muller, with the permission of Suna and İnan Kırâç Foundation Orientalist Painting Collection, Pera Museum.

of the Orientalism genre that imposes suppositions on Ottoman people and pastimes (Inankur 2014).

The only contemporary artwork in the exhibition, *Horror Vacui* (2017) by Alejandro Almanza Pereda catches children's attention in an incongruous installation half comprises a cement slab overlying the bottom half of an 18th-century landscape painting from Turkey (Pera Museum Blog 2017). While it is interpreted by the children as representing the environment trapped between nature and men, it also highlights how values and art are transformed across time and artistic preferences are deviating from hand-crafted paintings to modern conceptualisations made of concrete that blatantly indicate fine art being abandoned (Pera Museum Blog 2017). A leading figure of Turkish art and diplomacy, Osman Hamdi Bey's painting the *Tortoise Trainer* (1906) (Figure 11.2), which displays a man captivating tortoise with a special flute, ney, is one of the primary attractions for visitors to the museum.

Ultimately, these paintings present a retrospective look at different aspects of culture and related performances such as historical versions of fashion, entertainment, travel, and international dialogue that allow children to position Istanbul in a global setting. Our work simplifies complicated concepts, explaining new ideas via the narrative and related activities of a picturebook (ambassador, Orientalism, implications of variety in fashions like caftan). These explanations also give children a chance to view the paintings as a political and cultural medium between different countries.

In our case, children experience the collection with the guided tour enriched with play-acting as they are asked to perform one of the scenes from Vanmour's painting. Here, children re-enact the Venetian ambassador's presentation of the letter to the Ottoman Sultan by wearing the attire of a sultan, a vizier, and an ambassador. Children, in front of the Harem scene, imitate the figures in pairs. Children's engagement in this role-playing gives an insight into less descriptive and more interactive acts in the museum space. Since the theme of the guided tour and workshop focuses on the ambassador's role, the picturebook aims to complement it in numerous ways.

Designing the picturebook prototype

The picturebook is designed by selecting the story of the ambassadors to narrate and allow hands-on, bodily, and material engagements in the museum space. It introduces children to historical and cultural vocabulary and provides prompts that help children discuss the painting's content while synthesising the basic electric circuit embedded in certain parts of the content to inform, attract, and reason. Furthermore, the picturebook has two sides, one for interactions in the exhibition space and the other one for reading. The prototype, which is a 35 × 50 cm duplicate of the exhibition on



Figure 11.2 *Tortoise Trainer* (1906) by Osman Hamdi Bey, with the permission of Suna and İnan Kıraç Foundation Orientalist Painting Collection, Pera Museum.

one side by referring to its floor plan, is a large single-page version of the picturebook, providing a guided tour of the collection (Figure 11.3) and a map along with activity cards (Figure 11.4). It aims to provide hands-on, bodily, material, and critical engagements with artworks through different tasks (Table 11.1).

As part of the narration, children are expected to embark on a journey as the ambassador on a mission to find the message and carry it to the king. It is inspired by treasure hunts, and as such children are expected to read the



Figure 11.3 One side of the picturebook presents unfolded pages. Image by the first author.

clues, find the artwork, and experience it through specific performances (e.g., dancing, discussions, or drawing), check the additional information in the reading part, and find the next artwork. To help complete this task, there are small symbols that resemble objects or animals in the selected artworks left as clues to help the children identify the correct painting.

By incorporating LED lights in the narrative inspired by paper-circuits-related works, we utilised the circuit system to refer to the tasks carried out by ambassadors, carrying information between different parties to make the clues more playful and meaningful. Interacting with circuits hints at the location of the artwork in the space, but also reveals an important path between the artworks. For instance, pressing on the inside of a gold bowl lights up the next painting with a story on diplomacy and finance. The circuit system also highlights the historical tradition such as the training of tortoises by flute to carry candles while walking at night in the garden. By



Figure 11.4 Other side of the picturebook displays the plan of the exhibition along with a mission card and a name sticker. Image by the first author.

Table 11.1 Activities that are in relation to paintings provide different engagement types

<i>Painting</i>	<i>Task</i>	<i>Engagement type</i>
The Welcoming of Venetian Balios ... (1725)	Whispering game, pressing the gold symbol in this painting to light up the next one related with money	Hands-on, bodily, Material
Mehmet Said Efendi (1733)	Thinking as an ambassador for financial negotiation	Narrative
The French ambassador in Turkish attires (1762)	Designing a caftan and exchanging it with a friend as a gift	Hands-on, Narrative
A Scene from Turkish Harem (1654)	Imitating the dancing scene	Bodily
The Tortoise Trainer (1906)	Sliding the tortoise, lighting the candle, a number appears.	Hands-on, Material
Horror Vacui (2017)	writing a letter to the future as an ambassador of today	Narrative

swiping a bar with the tortoise image and pressing the flute image, children light up the candle, re-enacting a historical tradition of the use of candles at night through circuitry. We allowed the copper strips linking the light from one side to another to be visible since there were concerns that the children might not readily make the connection.

Thus, the picturebooks offer comparisons between at least two things: paintings at the museum and illustrations in the picturebook that represent the culture in the paintings and the children's own culture. In connection, the cards supporting the mission and the picturebooks' map/guide first explain the duty of ambassadors in that period on one side and then ask children to accomplish a similar task but one that is familiar to them in their daily life. Thus, these cards make children go back and forth to paintings to observe and evaluate what the ambassadors did and then later figure out what they could do and set criteria in this specific theme in a pleasurable way. Informative materials are offered in cards to explain and engage in activities as well as to describe certain terminology unique to the exhibition. Considering that children utilise the picturebook as a map of the exhibition floor, and follow the route through the instructions and games, the tasks provide embodied engagement and interaction as they move from one work to the next. The children would play a whispering game (or telephone) to pass the ambassador's message along, orally similar to the circuits carrying energy but offering sensorial and bodily engagement. For further engagement, children offer the caftan that they designed to a friend as a symbolic gift. To embrace the ambassador experience, they wear the ambassador's name tag and negotiate between countries about various issues. Finally, as they craft a letter to the future as an ambassador of today, all these activities coalesce to form the creative parts of the picturebook experience, they wear the ambassador's name tag and negotiate between countries about various issues.

Testing the picturebook prototype with the children

In Turkey, museums tend to produce activity books for schoolchildren since one of their primary audience groups is students. Because these activity books target mostly 9- to 12-year-olds, the participants of this project were seven children aged between nine and ten from a volunteer program. In this program, children who are studying at a public school attend a course taught by university students who volunteer over the weekends. The group of children never visited the Pera Museum before, making this their first exposure to the selected collection. In the selected exhibition area, we explained to them that we are designing an interactive picturebook about the exhibition and wanted to investigate its potential outcome with them. During the project, four volunteer university students with whom the children were already familiar were present to assist. The children were divided into two groups and each group was given one of the two copies of this

prototype. Both books aid in a dialogic reading of the content as well as of the instructions for certain activities. The first group consisted of three children and the second group consisted of four children. To understand in what ways children's interactions with the artworks can be strengthened by the help of picturebook, we paid attention to several criteria: to what extent children are making comparisons (e.g., the culture presented in the artwork with real life), having inquiries on the artwork and beyond it (e.g., picturebook, or daily life); recalling the narration and historical information during the activities; reflecting themselves within diverse ways.

To be a part of the narrative, they each wrote their name on a sticker as "Ambassador ..." and then stuck it on their clothes to identify themselves as an ambassador fostering collaborative working, reading, and negotiating acts. This was the first step in adopting the role of an ambassador and engaging in active dialogue about the museum content. They read the first card about the ambassador's mission and their first task began with the whispering game: to whisper the message to their friends and in doing so give them the next clue. It was quite a challenging task as it was a long sentence making it hard to remember. This stage of the game taught the importance of accuracy in communication and the duty of the ambassador to deliver a message carefully. Thus, whispering worked as an icebreaker and eased the social tension of introductions. Although they do the activity together as a group, they shared roles (e.g., reading the map, mission cards, dictionary, and picturebook) among each group's members. Therefore, the activity and novelties facilitated feelings of togetherness and collaboration as a group in the exhibition space. After reading the sentence in the whispering game, they started to search for an ambassador on a white horse and they found two paintings that faced each other. Since the clue hinted at the Venetian ambassador, they discussed which one appeared foreign and which one was from the Ottoman Empire. One child pointed out the very tiny flag on the horizon of a painting that distinguished the ambassadors.

Another mission required them to analyse the portraits of Comte and Countess de Vergennes dressed in Ottoman clothing and design their own caftans that they would later swap with one of their friends. Children were expected to reflect upon the accessories and attires as well as the reason for depicting a foreign ambassador in Ottoman clothes. However, they went beyond the aspects of fashion in that era to develop inquiries on today's diverse understandings of fashion. They first discussed among themselves why a foreign ambassador would wear Eastern clothes. Then, one child questioned why the male ambassador would wear clothes decorated with a flower pattern as he considered it unusual, opening up new discussions for instance on the pattern in relation to gender in different eras. This was useful in terms of comparing the past and present and engaging in critical dialogue on cultural and personal norms. When they were invited to decorate a caftan (Figure 11.5), some children decorated caftans with different patterns, one child drew the Ottoman flag to show that this caftan belongs to an Ottoman



Figure 11.5 Children's engagement with the artworks and the picturebook. Photographs by the first author.

ambassador, and one child explained that her drawing of Turkish and British flags together on a caftan implies the peace among countries. Thus, some children recalled the story of the ambassadors and visualise an abstract concept, diplomacy, in their drawings. This diversity in children's reflections on the same activity hinted us how the narrative account about ambassadors offered children different meaning-making opportunities.

Another task involved action. First, they were asked to select figures in the Harem Scene and then dance in pairs, which led them to guess that the dance the figures were involved in was unusual even for the time (Figure 11.5). Bodily interaction in this task paved the way for critical thinking because they questioned the feasibility of the dance figures in real life. After they read the definitions of Harem and Orientalism, they discussed how the artists could paint this scene from their imagination which might cause these unusual dance figures.

Although in guided tours, the attention is on the individual animals as main attractions, such as the dog figure in Mehmet Said's painting, during our run-through with our prototype picturebooks, children paid less attention to single details. Instead, they could ponder upon the artwork's story as a whole with the support of the picturebook that is illustrated in the following instances. They discussed financial negotiations between an

ambassador and the representatives of Sweden such as offering to split the money owed or accept a ship in lieu (Renda 2014) and agreed to find a third way to keep the peace since the ambassadors' duties were also to preserve diplomatic dialogue. At this moment, they remembered the first mission card about the features (e.g., being diplomatic, polite, and constructive) as well as responsibilities (e.g., fulfilling the duty given by a sultan or a king) of an ambassador so they build empathy towards the ambassadors.

Another task involved using circuitry in a meaningful way. Children press a detail from the painting and slide the tortoise to light the candle as well as to uncover the next clue which is a number (Figure 11.5). They added this number to the painting's production year to find the year of the next painting. In this task, they noticed that they could utilise the artwork labels to check the dates as well as the time difference between a historical and contemporary artwork. Therefore, they navigated themselves not only in the space but also in the chronology. One of the children confessed that among all the tasks, he liked sliding the tortoise to see the number (111) appear the most. Furthermore, children could easily discuss the circuit's function and relate the museum content to their school curriculum and previous knowledge before the museum visit. In this case, they also questioned the role of the copper strips (the materiality) visually linking one concept to another (the narrative) and discuss what this material can symbolise in this ambassador theme. After viewing the one piece of contemporary artwork and completing the task of writing as today's ambassador to a future ambassador, they settled down to discuss issues using the ambassador as a metaphor. They discussed how copper is a bridge between different energies, how an ambassador is a bridge between countries, and how art is a bridge between humans and nature. Thus, they once more recalled the narration on ambassadors to understand how the material (the circuitry) is in relation to the story. Moreover, they interpret this metaphor to understand today's world (e.g., the role of art in protecting nature).

Children had discussions on the aesthetic and technological features of the picturebook. A child started to inquire about the medium itself and proposed additional features by stating that the tortoise could move further or perhaps even walk by itself. Many of them commented that it would be enriching to hear the barking of the dog and the singing of the bird. Unexpectedly, one child questioned the missing paintings on the map and commented that there could be more paintings placed on the map. Although she likes that the book is informative, she prefers to see the names and exact images of the paintings on the map. Although children received a toy at the end of reading the picturebook, one proposed that the gift-giving could be even more physically engaged if it involved the exhibition space and the gift and some materials could be hidden in the exhibition area. Therefore, their criticality in this whole experience was not limited to the artworks, nor the narration in the picturebook, they prolonged their inquiries on the medium through material engagement.

Based on a set of criteria, testing children's interactions with the artworks through the prototype showed how each engagement type and the rationale behind the designs invited children for a more inquisitive museum experience. For example, (1) *narrative engagement* offered comparisons (the artworks and real life, the culture in a historical period and today's), inquiries on the artwork, developed empathy towards the ambassadors and other figures, and sought strategies to build peaceful dialogues among different cultures. Similarly, (2) *hands-on* and (3) *bodily engagements* provided diverse comparisons, inquiries on power dynamics in society, and questions about the norms. (4) *Material engagement* (paper circuitry and the picturebook) was efficient to recall the narration and historical information, build metaphorical relationships, and setting discussions on the role of their generation and art in creating future societies and environments. Ultimately, the (5) totality of these engagements revealed children's initial realisation of the discourses surrounding them and reflections to challenge these constructions.

Discussion

Critical heritage involves perceiving heritage as a process and constant recreations that reject authorised discourses with the help of various disciplines and underrepresented groups (Witcomb and Buckley 2013, p. 569), such as children who might be expected not to acknowledge the complexities of "heritage". By working with children who are less likely involved in museums as coproducers (Roussou *et al.* 2007), we aspire to integrate them in heritage-making as agents with interactive tools (picturebooks) designed specifically for their development and interest through narrative, material, hands-on, and bodily engagements.

Plural heritages and polyvocal imagination across time and space

The Orientalist Painting Collection at Pera Museum presents abstract, cultural as well as historic concepts that challenge children while displaying a valuable resource for imagining thought-provoking heritages. Diplomacy for instance is a difficult concept even for adults because it requires geographical and historical knowledge to understand what Venetian and Ottoman relations signified in different centuries. Although children were already aware of the geographical location of Istanbul and its pre-Republican history in general through their school curriculum, they still had a hard time grasping the diplomatic relationships that could occur and the main actors, the ambassadors, responsible for continuing constructive relationships between the countries. However, they overcame these challenges through the picturebook narration about the ambassadors which made material and bodily interactions meaningful. Hence, the picturebook as an interactive artifact and narrative contextualised the cultural heritage and provided material,

metaphorical, and informative entanglements that help children step into critical heritage. In line with previous studies offering participants polyvocal narratives, multisensorial interactions, and spaces to reflect themselves (Schofield *et al.* 2019, Claisse *et al.* 2020, Galani *et al.* 2020), we underscore the possibilities of valorising heritage discourses with children's participation through several factors: considering other studies that also specialised in museum education during design, creating embodied interactions through a material familiar to children, and providing imaginative narratives that help children to think different historical perspectives.

As conveying pluralistic narratives via digital technologies in heritage demands participants' acknowledgement of the self-other relationship and active listening (Galani *et al.* 2020), the children in our study imagined similar identity negotiations through different key figures in history. Because of the narration in relation to the historical facts, children did not only ponder the diplomatic relationships but also experienced the responsibilities of an ambassador, the sultan and some underrepresented groups, such as women at that period, thereby realising that cultural heritage is not singular. While trying to solve ambassadors' problems, children experienced the concepts of negotiation, compromise, sanctions, and communicating their message in a formal setting. Children challenged themselves to find a creative way to represent diplomatic relationships via images as well. For example, although the attires in the paintings feature floral designs, children re-interpret the symbolism of caftan in order to design their own caftan with flags of different countries. Hence, creative activities through narration help children interpret "past" and cultural heritage as a dynamic process in a flow affecting present social issues. The picturebook married the past to the present by using the activity cards that first gave them the duty of the ambassador in the past and then related it to the children's duties today. Although the picturebook facilitated a comparison of past and present cultures, drafting a letter to a future ambassador at the end was meant to open their minds to the fact that similar issues to occur at any time. Since this activity as a cultural probe help participants to reflect on histories based on their community (Schofield *et al.* 2019), it provided children with a tool to consider the discrepancies in the future of cultural and natural heritage and their own role to bridge between past and future in cultural heritage.

Embodied and material assemblage of criticality

Similar to the studies that pave a path to participants through artworks and activities or offer treasure hunt-themed engagement with artworks in museums (Yiannoutsou *et al.* 2009, Thom-Santelli *et al.* 2006), children were supported by the map and the narrative of the picturebook to connect them and orient them within the space. Both reading the map and then finding the corresponding artworks within the actual space was sometimes demanding for children however clear clues combined with tasks about the paintings were helpful. The circuit lights on the map further assisted children in

finding their way around in the museum space. Children also experienced reading the museum's sources (e.g., labels, boards) in a fun way; therefore, a picturebook can benefit children by providing a sense of agency in visiting the museum with their friends. As children were walking, running, zigzagging, pathfinding, stopping each other (while considering other visitors), and dancing in the space together through guided prompts, "they created shared embodied ways of being in the space" (Hackett *et al.* 2018, p. 177).

By capturing children's attention by giving the picturebook enhanced with circuitry and light (Qi *et al.* 2015, Hershman *et al.* 2018) and then assigning them a meaningful role related to the stories of the artworks, the paintings that once were found to be less attractive and maybe even dull became more engaging as children critically reflected upon them. Sometimes bodily challenges raised awareness as well as interest. The whispering game, for instance, allowed them to experience how difficult it was to deliver a message from one person to another, let alone from one country to the other. In addition, children could socialise among themselves and feel comfortable about moving around the museum space even though some of them did not know each other and the museum at the beginning. The book provided numerous benefits supported by the symbolic interpretation of artworks through social gestures while still making the centre of the artwork of attention. Children exercised deictic gestures (such as pointing out the details on the paintings) and mimicked the figures on the paintings. While they were doing this, they compared today's dance movements with the old ones and discuss Orientalism. Since children were mostly interested in developing the interaction through guided tasks, picturebooks in relation to museums can benefit from basic craft paper enhanced with circuits to draw attention to the details in the artworks (e.g., the dog or a candle on the tortoise), certain traditional acts (e.g., training the tortoises), and to link children's school curriculum with what they were learning at the museum.

Since being guided by a museum expert provides greater learning gains in comparison to children independently playing in museums (Weisberg *et al.* 2016), we underscore that guidance and structure are important in children's museum learning for two reasons. First, children benefit from the assistance adults can offer to understand the directions in the narrative. Secondly, after the workshop, a concluding guided tour was provided to children upon their request, which helped us to evaluate how much they recalled. Even without the tasks, they were still interested in Van Mours' painting and willingly engaged in the activities from the book. Besides retelling the story about the characters and ceremonies based on the picturebook reading experience, they were also interested in discovering additional details in the paintings on their own. This proves that guided learning is significant in museum learning and how this activity supported by the picturebook prototype could enrich the museum guide herself.

Comparison of interactions of children in the general tours (according to the earlier experience of the first author) and in the picturebook workshop

shows how the picturebook complements the other. The first painting on welcoming the Venetian ambassador in the Ottoman lands was explained through the drama activity by imitating the scene by describing the traditions in the guide tours. Similarly, the picturebook provided a bodily engagement but this time it focused on experiencing the challenges of being an ambassador. For the portrait of Mehmet Said Efendi, the discussions in the guide tours focused on mostly the dog which is more compelling to children in addition to mentioning the historical story. Through the narration in the picturebook, children discussed the historical story, tried to think like an ambassador, build empathy towards him and therefore, spend more time solving the challenge. While children in general tour guides can discuss the diplomatic and cultural reasons for painting the portraits of the French ambassador and his wife in Ottoman clothes and the richness in the attires, the utilisation of the picturebook helped children to visualise this abstract concept of diplomacy as well as make a comparison of the history with the real life. As embodied activities in design practices encourage participants to reflect on cultural heritage (Schofield *et al.* 2019), engagement with the Harem scene through dance provides efficiency in evoking children's responses. Also, the picturebook narration emphasised the concept of Orientalism which children critically think about historical and contemporary cultures. The symbolism, animal and human figures in the tortoise trainer painting are widely explained during the guided tour after storytelling about who the painter is. The picturebook, however, mostly focused on cultural tradition. In general, contemporary artwork guided tours can offer more detailed explanations on a range of artworks than a picturebook reading. Also, art and historical concepts can be reinforced in the creative workshops led by the Learning Programs. However, testing the picturebook with children showed that critical thinking about culture via bodily, hands-on, material, and narrative engagements can be encouraging in order to grasp the artwork's essence.

Conclusion

This study explored ways to hone children's interactions with cultural heritage in museums by considering research in HCI-museum interactions and then synthesising them with picturebook studies. Children's participation in heritage-making encompasses several layers; learning about the artefacts, examining the details in the artworks, playing with the tools, and critically reflecting on the concepts, implied in the paintings, through embodied activities and active discussions.

Firstly, our study recommends professionals in museums and cultural heritage studies to benefit from interdisciplinary environments of museums with a focus on children's narratives and preferences. As an example, picturebook studies back artistic and educational outcomes such as learning new concepts, easing the challenges of understanding historic concepts, and synthesising physical actions to new vocabulary via utilizing the circuitry.

Furthermore, these narratives foster children's experiences and evaluation of curatorial decisions by giving them agency in a storytelling path that builds dialogue and winds between the artworks and real life.

Offering interactive prototypes to children suits their motivations for interaction and their related curricular content at school. Rather than just presenting them bare descriptions, posing questions in relation to material engagement inspire children to explore the paintings with language arts and support their vocabulary. For instance, circuitry opens up new topics related to the school curriculum, but this technology can be utilised in museum learning programs in a metaphoric way. What we found useful was to familiarise the new terms with activities that could be meaningful for the selected age group (e.g., designing caftan, casting the children as the ambassador). Finally, utilising visual materials derived from the collection and referring to the most attractive details highlighted with interactions facilitate the children's attentive observations.

To foster children's museum experience, inquiries on the cultural practices in past and present, and participation in the heritage making as a stakeholder, this research suggests the importance of utilising narrative, playful, and embodied interactions that include activities urging children to think from the figure's perspective and generate their personal reflections. Revisiting objects and practices, such as reading picturebooks, in new and creative ways, and supporting children through prototypes would benefit practitioners to make the stories of the paintings more memorable and questionable. This way, the terminology is more accessible and the museum engagement is dialogic. There is an interplay between the content in the picturebook and the social interaction in the museum setting that makes it easier for children to process historic content, imagine how certain events in the past could have been explored in more peaceful and inclusive scenarios, and reflect on individuals' responsibilities for a better future.

Our study also recommends considering technologies (such as circuits) not only through their educative and aesthetic aspects but also due to their potential cultural and historical entwinements. By embedding technologies (in our case circuits) in an appropriate narrative, children can engage with metaphorical concepts (e.g., transmitting energy like ambassadors delivering messages), revealing a way to process allegorical interpretations through novel systems. This case can be expanded by discussing visual to conceptual metaphors if desired according to the age of children involved as well as the guide or instructors' choices. Besides metaphors, differing verbal devices may also be used to trigger debates and further interactions. How these may support a different modality beyond the visual can be a bridging experience and even be tested out at more experimental levels by children themselves. Hence, this study demonstrated in a nutshell that the integration of paper technologies with picturebooks has a significant potential to ease the perception of these complex concepts. Further sensorial and embodied explorations of picturebooks and paper-based counter surface technologies

can support the co-existence of material, hands-on and narrative experiences to encourage children's contribution to the heritage field while facilitating enjoyable musings.

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