

Paintings Alive

An Interactive Film for Young Museum Visitors

Victoria Wetzel

Interactive Filmmaking Lab, Scotland

Polina Zioga

*Interactive Filmmaking Lab, Scotland
University of Stirling, Stirling, Scotland*

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Abstract

To reach younger audiences, museums worldwide have incorporated interactive and hands-on activities, while some venues specialise in children as their main audience. Videos, in particular, can be easily integrated into the museum space and provide a variety of application possibilities. Their use creates a hybrid experience for the visitor in which the interaction between physical and digital elements transforms and enriches their experience of the exhibits. Furthermore, interactive technologies have been proven to increase visitor numbers and interactions on- and off-site. In this context, our practice-based research focuses on the use of interactive video technologies and factors that can lead to the design of engaging and user-friendly museum experiences for children to

investigate their application through the production of a new interactive film for young museum visitors. A museum was chosen as a case study, and a survey was conducted to achieve this. The results indicated that creating an interactive video could benefit the areas that were visited less; the preferable length is relatively short, while hands-on and video installations promote and prolong the engagement of young visitors and are favoured by both younger and older children.

Additionally, fictional or dramatised stories are attractive to children compared to documentaries; accessing the interactive content on their mobile devices would be preferable. These have led to the production of *Paintings Alive*, an interactive film for children, featuring and reenacting the paintings in the museum's art gallery and accessible on the visitors' mobile devices. Our article also discusses the project's findings, alongside the challenges and limitations imposed by the COVID-19 pandemic, and offers recommendations for future work.

Keywords

children, interactive film, interactive narrative, interactive video installation, museum

1. Introduction

Research has shown that children can learn through play and discovery (Silav 2014, 1).

Accordingly, to reach younger visitors, museums worldwide have adapted, incorporating events for the whole family (Birkett n.d.). Interactive and hands-on activities have been integrated into museum exhibitions, while some venues specialise in children as their main audience, like Eureka!, “the leading children’s museum in the UK” (Museums.EU 2014). Therefore, to make children feel welcome in a museum, it is essential to identify how installations can become more engaging and how relevant information can be delivered in a child-friendly way. Interactive video technologies are particularly appealing to younger visitors since children are exposed to interactive stories through video games and mobile apps (Newton 2017). For example, the British Museum “harnesses this opportunity to engage children with history and culture through new technology that they feel familiar with” (Bachi et al. 2016, 26). At the same time, videos can be easily integrated into the museum space with a variety of application possibilities, providing an efficient way for highlighting and drawing attention to aspects of the displayed artefacts that otherwise might be missed or not communicated well. Thus, their use creates a hybrid experience for the visitor, in which the interaction between physical and digital elements transforms and enriches their experience (Saha 2019). Furthermore, interactive video technologies have been proven to increase visitor numbers and interactions on- and off-site (Ohlson and Villaespesa 2014, 4).

Accordingly, this article examines the factors that can lead to creating engaging and user-friendly museum experiences for children using interactive video technologies, intending to investigate their application by producing a new interactive film for young museum visitors. Different types of interactive video installations for children in museums have been identified, and a museum was chosen as a case study to understand the visitors’ behaviour better. The initial results led to the production of *Paintings Alive* (dir. Victoria Wetzel 2020), an interactive film for children featuring and reenacting the paintings in the museum’s art gallery and accessible on the visitors’ mobile devices. Lastly, the article discusses the project’s results and offers recommendations for future work.

2. Interactive and Video Installations for Children in Museums

Different types of museums have different needs and approaches to displaying their artefacts, including visual art and objects of cultural significance, animals and plants, or scientific displays, often used to tell a chronological story of a particular locality (History of Museums 2020). Whilst most museums only have a small section, a quiz or a special guide for children; some museums specialise in children as their primary group of visitors. For example, Eureka! has “[h]undreds of interactive, hands-on exhibits [...] designed to inspire children aged 0 to 11 to learn about themselves and the world around them through play and discovery” (Museums.EU 2014).

Traditionally, displayed artefacts at museums are accompanied by labels, leaflets or a tour guide. While some visitors might prefer reading detailed and in-depth information, others might not have the patience or the ability to, like young children. For them, installations including audio, video or hands-on activities might be better. As a result, science museums have changed their static displays to other forms that can be touched and interacted with (History of Museums 2020). A good example is the Science Museum in London, which first opened its Launch Pad in 1986 (Science Museum n.d., 8), which involved “specially-designed interactive ‘hands-on’ exhibits,” enabling “visitors, and especially children,” to “discover the ways things work through their own use of them” (ibid.). The Victoria and Albert Museum also has a “large number of fragments [that] are available to be touched, and others can be found in drawers,” including dedicated “Discovery Areas” (Dernie 2006, 33). This shift in installation design has promoted touch as an interactivity modality. At the same time “the museum learning experience takes on a fresh character: it becomes more varied, playful and memorable, and, perhaps most importantly, accessible” (ibid.).

2.1. Accessibility

Accessibility, in particular, is essential when creating installations for children. An early example is the Brooklyn Children Museum (the

first children's museum in the world), which, around 1895, innovated "its gallery design by rescaling its cases and desks and devising movable hinged labels on boards for younger visitors" (Parry and Sawyer 2005, 41). More recently, children and their families created the "Kids in Museums Manifesto" to make museums more accessible for children, citing diverse activities, touchable objects, and clear labels as very important factors (Kids in Museums 2021). As such, children's museums aim to "teach children more about themselves and the world around them within an interactive learning environment" (Silav 2014, 1) that is both entertaining, as well as accessible and user-friendly.

2.2. Interactivity

Interactivity is commonly used in the design of installations to make learning fun for children, enabling them to either touch or play with objects or video-based technologies. This emphasis on the "importance of interactive elements in exhibitions, as well as younger visitors' preference for them, has been demonstrated numerous times" (Hein 1998, 143-44). For example, the Glasgow Science Centre uses hands-on interactive modalities to engage their (younger) audience in science (Glasgow Science Centre 2022), and the GRIMMWELT museum in Kassel uses interactive videos to integrate the visitor in fairytales (GRIMMWELT KASSEL n.d.). Interactive videos on touch screens can also involve interactive films, which allow the user/visitor to alter the storytelling and plot structure, or projection mapping, where different sections respond to the visitor's comments.

Furthermore, the affordances of interactive digital tools, such as touch screens, mobile apps, or location-based audio guides, have allowed museums to explore "new narrative possibilities and expand the visitor experience [...] beyond the physical limits of display [...] to create a hybrid experience, enabling physical and digital to coexist and interact in a way that transforms and enriches the visitor experience" (Saha 2019). A good example of physical and digital working together is an installation at the GRIMMWELT museum in Kassel, where the visitor sits down, and a live video of them is projected on an angled glass in

front of a small chair and table. From the visitor's point of view, it looks as if they are sitting at a table with the seven dwarfs, immersing them in the *Snow White* fairytale.

The use of video technology also increases visitor numbers and their interaction with a museum's installations, as seen, for example, in Tate's "The 1940's GIF party" project, in which visitors were able to turn popular paintings into moving GIFs (Ohlson and Villaespesa 2014, 4). As the GIFs were shared online by the visitors, they generated more traffic on Tate's website, attracting international attention and raising awareness of the collection and the museum (ibid.). This further prompted participants to interact via social media, creating "a real community [...] around this participatory experience" (ibid. 11).

In particular, interactive films on touch screens combine two crucial factors for creating a child-friendly museum installation: touch and interaction. At the same time, the production of interactive films for children has taken a new turn since Netflix decided to test interactive content on their platform in 2017, with children as their first target audience due to their familiarity with interactive stories in video games and mobile apps (Newton 2017). Carla Engelbrecht Fischer, director of product innovation at the time, stated that "kids are eager to 'play' with their favorite characters and already inclined to tap, touch and swipe at screens" (Alvarez 2017). To enable this, interactive decision points are introduced using text boxes at the bottom of the screen. As some children might not be able to read, the different options are verbally explained, and corresponding images are shown for the viewer to choose from.

Another type of interactive video installation is projection mapping, which is "the display of an image on a non-flat or non-white surface" (Projection Mapping Central n.d.). A good example is "Le Petit Chef," created by Skullmapping (n.d. b), a projection tailored for restaurants and mapped to the guests' plates. While the guests are waiting for their meal, a little chef creates it in front of their eyes (ibid.). Then the meal is served as a real dish. The same company also worked on "Gallery Invasion," a projection in an art gallery where an animated person enters the gallery from behind a

picture, steals an airplane, and creates chaos, while being chased by a monkey (ibid. a). As such, projection mapping can animate a space through a new way of storytelling, which can be highly entertaining for children.

3. *Paintings Alive*

3.1. Project Description

Paintings Alive is an interactive film for children, written by Victoria Wetzel and Ben Riley, featuring paintings exhibited in The Potteries Museum & Art Gallery. The viewers/users follow Éloïse, the character of a portrait, moving across the gallery while they decide which painting they want to visit next. During the navigation, they discover the characters portrayed, their lives and their relationships. The key cast and crew of the film include the first author, as the producer, director, editor and interaction designer; the actors JD Kelly, Esther Slater, Sherrone C, George Scott, Ernest Vernon, Serguté Warner-Bowen, and Georgia Jasper; Sean Keegan as the cinematographer, Josephine Bakewell as the sound mixer, and Martina Majcen as the production assistant.

Following ethical approval, the project investigated in practice which factors can lead to the design of engaging and user-friendly museum experiences for children using interactive video technologies. A study was conducted with the museum staff's participation to gain a better understanding of young visitors' behaviour. The initial results led to the idea development and guided the film's production with the goal of educating children on the history and lives of the people portrayed in the paintings, thus encouraging them to explore the art collection. As such, the project combines narration, interactivity and education in a museum setting through video technology, and it is the first of its kind produced in the Potteries Museum and Art Gallery.

3.2. Survey

The survey was conducted with the participation of The Potteries Museum & Art Gallery staff, who provided their written informed consent and were recruited directly by the first author. A

questionnaire was used to identify which museum installation types are more attended by the visitors, how long they spend at different collections, and which area/s might be more appropriate for developing a new installation for children.

The first question revealed that the Natural Sciences exhibition has the most visitors, whereas the Ceramics and Fine Art areas are visited the least (Table 1). This indicated that new work could benefit one of the latter areas. Responding to the question "How much time do visitors spend at an installation on average?", 30% answered that visitors only spend up to five minutes at an installation, 30% answered five to fifteen minutes, 30% replied that this depends on different factors, and only 10% indicated that visitors spend fifteen to thirty minutes.

Table 1. Analysis of participants' questions 1-3

What area is visited most/least by children?			
	Most	Least	Equally
Ceramics		50.00%	
Fine Art		50.00%	
Local History	33.33%		
Natural Sciences	50.00%		
Staffordshire Hoard	16.67%		
All Areas			100.00%
Total	100.00%	100.00%	100.00%
How much time do visitors spend at an installation on average?			
1-5 minutes		30.00%	
5-15 minutes		30.00%	
15-30 minutes		10.00%	
Depends on different factors (e.g. interest, companion, interactivity)		30.00%	
Total		100.00%	
How much does the attendance at an installation vary depending on the installation type?			
Longer if child-friendly		33.33%	
Longer if hands-on/interactive		50.00%	
Depends on who they are with		16.67%	
Total		100.00%	

In the question “How much does the attendance at an installation vary depending on the installation type?”, 50% of the participants responded that visitors stay longer at an installation if it is hands-on or interactive, 33% mentioned child-friendly installations, and 17% replied that this depends on who they are with. Responding to the question “Do visitors tend to only go to one area of the museum or visit all areas (including different floors)?” approximately 57% of the participants answered that most visitors tend to visit all the floors of the museum, 29% indicated the ground floor, while 14% responded that this depends on whether they have visited the museum and particular areas before. While in the question “Based on your experience, which type of museum installation is the most interesting to children?” the museum staff identified the hands-on (55.56%) and video installations (44.44%). To further understand which types of installations and narratives are preferable, participants were asked how the attendance differs for each type according to the children’s age group. The respondents’ majority (66.67%) replied that “younger children” prefer hands-on installations, compared to videos (33.33%); “older children” seem to be equally more attracted to videos (50.00%), compared to hands-on installations (25.00%) and vitrine displays (25.00%); whereas across all ages, there is a balanced preference towards hands-on (50.00%) and video installations (50.00%). As children usually visit a museum with an adult, participants were also asked “Do adults tend to embrace video technology in the museum or try to keep their children away from it?”. The majority (57.14%) replied that they would embrace it, while 28.57% said they would reject it.

Finally, in their open comments (Table 2), 20% of the participants added that videos are more embraced by children if they involve dramatised rather than “documentary-like” storytelling. It would be preferable to have short interactive content accessed by children on their own devices to prevent disturbing other visitors in the gallery (20%).

Table 1. Analysis of participants’ open comments.

Is there anything else you would like to add concerning children or video technology in the museum?	
Video in the art gallery would be preferable	20.00%
Video technology is more embraced by children if it involves dramatised rather than “documentary-like” storytelling	20.00%
Short interactive content for children on own devices is preferable to prevent noise in the gallery	20.00%
Video technology do not allow children to make own first-hand experiences	20.00%
Some adults might tell the children to move on even if they want to stay for longer	20.00%
Total	100.00%

3.3. Interactive Film

The survey results demonstrated that the museum’s Fine Art and Ceramics areas would benefit more from creating new video work or installations. Since there was already a video of Ozzy the owl (Roadley 2020) in the Ceramics exhibition, it was decided that the new work should be tailored to the art gallery. The survey also revealed that making the video accessible via the visitors’ mobile devices would be preferable. Therefore this could be facilitated by creating an interactive film uploaded on an online platform.

3.3.1. Pre-production and Interaction Design

Those mentioned above further informed the decisions taken during the pre-production and scriptwriting stage. More specifically, based on how much time visitors spend at an installation, with interactivity and hands-on installations seen as prolonging factors (Table 1), it was decided that the optimum length of the film should be between five and fifteen minutes. Consequently, this determined the number of the paintings, characters and narratives included in the script.

Based on the latter, the time dedicated to each painting/narrative was approximately one minute, and seven paintings were chosen. Moreover, to identify which paintings should be included in the film, further research was completed on the people portrayed and their lives, many of which involved romantic relationships. For this reason, love was chosen as the story's central theme. The narrative structure (Figure 1) follows the order in which the paintings are exhibited in the gallery, creating the illusion that the viewer walks in the actual space while navigating the interactive film. To further intensify this, the first-person perspective/point-of-view (POV) was chosen for the cinematography, with the portraits talking directly to the camera/viewer, breaking the fourth wall. Additionally, the viewers can decide how they want to navigate the story and the gallery space. To achieve this, decision points/prompts were included in the script while maintaining continuity of content and style across all branching paths.



Figure 1. The interactive narrative structure and node system design of Paintings Alive (dir. Victoria Wetzel 2020).

3.3.2. Principal Photography and Post-Production

The Principal Photography took place using a portable green screen (Figure 2) to virtually place the characters inside the paintings during the post-production stage.



Figure 2. Green screen filming (Bakewell 2020).

In order to superimpose the actors on the paintings, the originally portrayed people were removed, and the images were filled with a continuous background using the Adobe Photoshop software, generating at the same time multiple layers to create a realistic illusion of the characters living inside the paintings (Figures 3, 4, 5, and 6). Following this, the video footage was keyed and superimposed on the paintings' layers using the Adobe After Effects software. The actors were colour-corrected, to make them blend with the background.

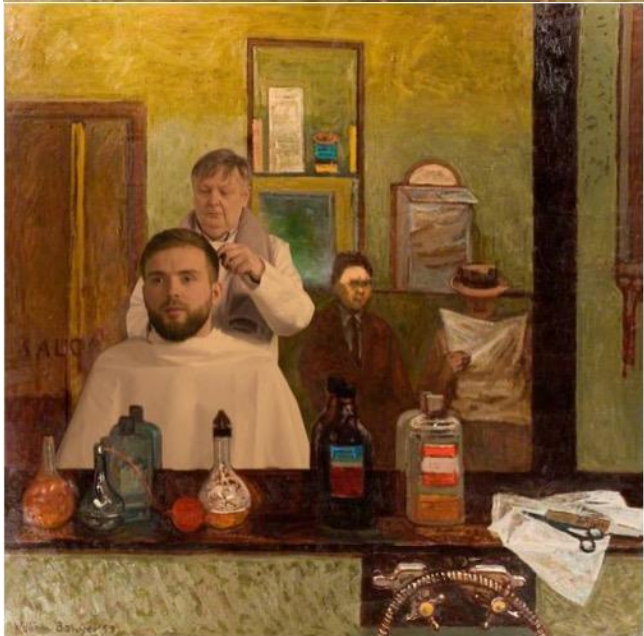


Figure 3. Top - *Short Back and Sides* (Bowyer 1958); bottom - Still from *Paintings Alive* (dir. Victoria Wetzel 2020).

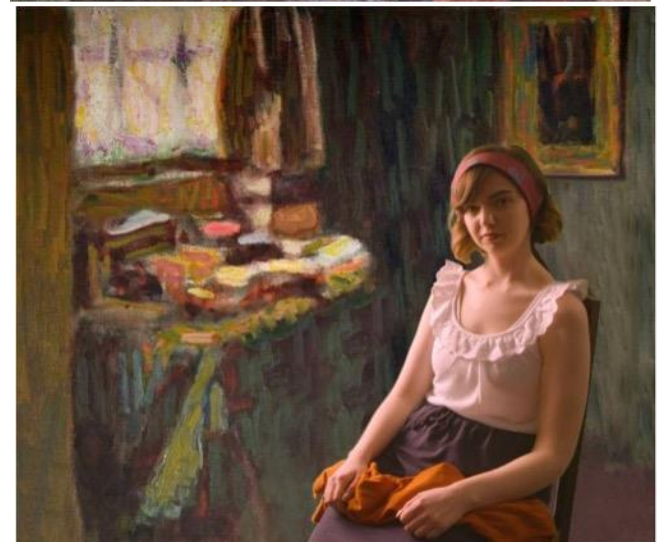


Figure 4. Top - *Interior* (O'Connor 1909-1910); bottom - still from *Paintings Alive* (dir. Victoria Wetzel 2020).

Finally, the videos of the paintings were superimposed on the gallery wall. Towards this end, Google Street View panoramas were imported into the Adobe After Effects software, and an internal camera was created to allow unrestricted navigation inside the virtual gallery (Figure 7).



Figure 5. Top - *The Witch* (Currie 1913); bottom - still from *Paintings Alive* (dir. Victoria Wetzel 2020).



Figure 6. Top - *Portrait of Hélène Yellin* (Roberts n.d.); bottom - Still from *Paintings Alive* (dir. Victoria Wetzel 2020).

The final development of the interactive film was realised on eko, a free online interactive storytelling platform (eko n.d.), with the paintings,

their location or the portrayed people's names used as interaction points (e.g., "Café" and "Barber Shop"). Based on the official bbfc ratings, which state that "occasional gory moments may be permitted if justified by the context" (bbfc n.d.), the age recommendation of the film is for children aged 12 and up because towards the end of the film one of the characters talks about being shot by her lover. To make this film appropriate for younger children, another version has been created that omits this part of the story. Accordingly, in the beginning, a warning is shown stating that parents are recommended to watch the film with their children. After this message, the viewer is presented with the option to choose if the child is under or above 12 years of age, leading to the corresponding version of the film. The final film could then be viewed by accessing the film's URL address, for example, scanning a QR code and/or embedding the video to a website, thus maximising the potential of reaching increased numbers of viewers.



Figure 7. Still from *Paintings Alive* (dir. Victoria Wetzel 2020) with Google Street View Image of the Art Gallery (Google, image captured in Jul 2017).

4. Discussion and Conclusions

This research sought to identify the factors that can lead to engaging and user-friendly museum experiences for children using interactive video technologies, examining different types of interactive video installations, and choosing a museum as a case study to better understand the visitors' behaviour. The survey completed by the museum staff has provided valuable insight. The results showed that adults tend to embrace video technologies at museums, and informed the decision to create new work for the Fine Art area

that was least visited. They also indicated that a shorter (up to fifteen minutes), rather than a longer duration, is preferable. Finally, they showed that hands-on and video installations promote and prolong the engagement of young visitors and are favoured by both younger and older children. Additionally, fictional or dramatised stories are preferable to children compared to documentaries. Thus, an interactive film viewed on a touchscreen, for example, a smartphone, can fulfil these criteria, while a simple interaction design and navigation system can promote accessibility. These results led to the production of *Paintings Alive* (dir. Victoria Wetzel 2020), an interactive film for children featuring and reenacting the paintings in the art gallery of The Potteries Museum & Art Gallery, that can be accessed on the visitors' mobile devices. In particular, the film has a total duration between 9 minutes and 18 seconds to 10 minutes and 8 seconds, depending on the path the viewer chooses to follow. It has been written and designed to be accessible for younger and older children by combining two versions, the choice of which is determined at the beginning of the film, to ensure that the content appearing corresponds to the viewer's age.

4.1. Challenges and Limitations

One of the first challenges was that due to the low staff availability, only five participants could complete the survey. Nevertheless, their answers provided valuable insight that informed the progress of the research. The original idea development involved filming inside the museum. However, when the presence of cast or crew on the premises was not deemed possible due to museum logistical reasons, the production changed to include a green screen. Furthermore, shortly after the completion of the green screen filming, the first lockdown of the COVID-19 pandemic came into effect in the region. As a result, filming of the museum's art gallery could not take place either, and instead, Google Street View panoramas have been used. The continuing COVID-19 disruption has also led to a delay in releasing the film, and the evaluation of its potential effect in increasing the number of children visiting the museum's art gallery onsite or the number of visitors of the museum's website online.

4.2. Recommendations

An online presence is beneficial for a museum to make its collection accessible from home. This was already implemented before the COVID-19 pandemic in museums like the “New Mexico Museum of Natural History and Science in Albuquerque” (Blakemore 2018). Adding interactive content on museums’ websites, further promotes accessibility and engagement. Similar observations were also made during the pandemic, as digital technologies are “transforming connectivity across society” (Zioga and Vélez-Serna 2022), increasing accessibility, helping other cultural settings as well as engaging new audiences.

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