Configuring Slow Technology Through Social and Embodied Interaction: Making Time for Reflection in Augmenter Reality Museum Experiences with Young Visitors

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Keywords: immersive experiences, children in museums, slow technology, reflective technologies, augmented reality.

Biography

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Introduction

The use of digital technology to create engaging experiences in museum settings has attracted the interest of museum professionals, digital technologists and designers alike. Significant investment and activity in this area of research and practice has resulted in a number of recent high-profile permanent gallery developments; for example, Gallery One—launched in 2013 and relaunched as

ARTLENS Gallery in 2017 in Cleveland Art Museum—used 'an innovative blend of art and technology' to invite 'visitors to connect actively with the art on view through exploration and creativity' (Alexander, Barton & Goeser, 2013). This institution-led activity is further complemented by numerous temporary and event-based digital interventions in the museum space, spanning digital interactive art installations to augmented/mixed and virtual reality mobile experiences, gaming and guided visits by artificial intelligence-driven robots, to mention just a few. These technologies often aim to provide 'an additional layer of content' (Marshall, Dulake, Ciolfi, Duranti, Kockelkorn & Petrelli, 2016) and an alternative way of storytelling for a variety of museum audiences by augmenting the museum space with digital information such as audiovisual materials, real and fictional representations of the past and future, and novel interactions.

One area that has seen significant development in recent years is the use of augmented reality in museum and heritage contexts. Parry (2007) traced the use of immersive and 'make-believe' approaches in museums back to the 1800s to establish 'performance, theatricality and "virtuality" as defining characteristics of the museum' (p. 75). Augmented reality digital applications engaging children with both their natural and cultural/historical environment also have a long tradition; they span early experiments in using mobile and augmented reality technology to simulate the experience of savannah animals (Facer, Joiner, Stanton, Reid, Hull & Kirk, 2004) to current uses of augmented reality technology to enable children to experience the natural environment (e.g. Rowe, 2014), art (e.g. Price, Sakr & Jewitt, 2016), the past (e.g. Hall & Bannon, 2006), and imaginary worlds (e.g. Snibbe & Raffle, 2009). Augmented reality has been associated with offering children enhanced opportunities for learning through an embodied, immersive, multisensory and playful engagement with the museum environment.

Hall and Bannon (2006), reporting on children's engagement with digitally augmented museum objects in the Hunt Museum, highlighted that ubiquitous technology that disappeared within the fabric of the exhibition led to prolonged and discovery-based engagement and learning among the children audiences; they also raised issues around the need for scaffolding children's experience before and during the visit. Further, Snibbe and Raffle (2009), reflecting on their extensive experience of creating social immersive media displays for history, science and art museums, emphasised the role of the body as 'an "input device", unencumbered by electronic props' and urged us to design for behaviours that prioritise social rather than individualistic experiences of immersion in museums (p. 1447, see also Hindmarsh, Heath, vom Lehn & Cleverly, 2002). Scholars and practitioners, therefore, have shown an interest in technology that shifts from the traditional paradigm of augmented reality delivered on screen-based mobile devices and single-user interfaces, to adopt a more holistic approach to the augmentation of the museum environment that considers the physical, social and

embodied dimensions of space. In this context, ideas borrowed from the concept of slow technology (Hallnäs & Redström, 2001), such as the distinction between technologies that are 'tools explicitly used in specific situations' to support specific tasks, and technologies that 'are more or less continuously present as part of a designed environment', are particularly useful in understanding experiences of dwelling, engagement and reflection among young museum visitors and their families (p. 201). In the philosophy of slow technology, the purposeful use of 'slowness in learning, understanding and presence' gives people 'time to think and reflect' (Hallnäs & Redström, 2001, p. 203; see also Odom et al., 2014).

Drawing on empirical work from a research-through-design (RtD) augmented reality museum project in Newcastle upon Tyne (UK), this chapter reflects on the place and role of slow technology in engaging young audiences and their families during facilitated and non-facilitated museum visits. While empirical studies of augmented reality installations in museums exist, focused empirical work of museum digital interventions using slow technology and specifically encompassing young visitors, their families and museum facilitators are less forthcoming. By focusing on the work of museum facilitators with young people through technology, the chapter acknowledges that meaningful interactions in augmented reality museum spaces are co-constructed. This not only occurs through the interaction of young people with the technology, but also through interactions with learning facilitators, members of the family group, and the narrative and physical environment of each installation. Further, the chapter considers how assumptions, expectations, skills and working practices of museum learning facilitators shape the way slow technologies are embedded in museum experiences and the kind of experiences that these come to engender.

The following sections introduce the digital interactive installation The Borrowers and outline the methodological approach of its study with young visitors, their families and museum facilitators. Drawing on vignettes from an ethnographic study with visitors and museum facilitators, we critically reflect on how the space of interaction is dialogically re-imagined by facilitators and young people and how slow technology supports, or challenges, embodied engagement with the exhibition environment. The chapter concludes with a discussion of key emerging topics from the empirical study, specifically how slow technology encourages a reconceptualisation of museum dwelling. Further, it discusses how the social, spatial and artefact ecologies of these environments reflexively constitute augmented reality museums experiences and enable reflection around both technology and museum content.

The Borrowers Display

The Borrowers interactive installation[1] was developed for the *Nuffin' Like a Puffin* exhibition, a celebration of 70 years of Puffin books in Seven Stories, The National Centre for Children's Books. The exhibition was organised chronologically, spanning from 1941 to recent Puffin publications, and opened to the public in June 2010 for 12 months. The exhibition space was partitioned into rooms dedicated to specific books, combining original material from the archive, child-size sets of selected scenes and activities based on each story. The Borrowers room was located at the beginning of the exhibition. The room was set up like a living room; it had three walls, which exhibited a small number of original framed illustrations, edited manuscripts and letters from the archive alongside a writing shelf with paper, colour pencils, a message board and a copy of *The Borrowers* by Mary Norton. On the large main wall, facing visitors as they entered the room, a grandfather clock with framed original illustrations either side provided the locus of the installation.

The purpose of The Borrowers installation was to create a sense of immersion for visitors, akin to making a visit to the Borrowers' home and catching the Clocks family, small people living under the floorboards and behind the walls of an ordinary house, going about their daily business. The nature of the interaction was expected to be both playful and engaging, where the visitor would be presented with a variety of possible experiences with the Borrowers.
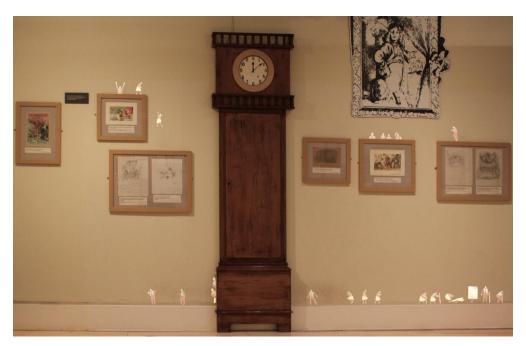

Figure 1: View of The Borrowers augmenter reality installation with all projected states of the characters shown to demonstrate the spread of their visibility across the wall. Only one of these projected states would appear at any one time. Source: The authors (Copyright).

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[1] The project was developed as part of a Collaborative Innovation Partnership (CIP) between Newcastle University and Seven Stories, funded by One NorthEast (now defunct).

The interactive installation consisted of video projected characters from the book, Pod and Arrietty, a small man and girl, each of around 10 cm in height. They would pop up and down above frames, run out from behind the grandfather clock, hide behind pieces of paper and carry pencils (see Figure 1). Characters appeared intermittently, replicating the hiding behaviour of the Borrowers described in the book. The projections of the Borrowers were triggered by the movement of visitors in the room via a face-tracking camera, embedded in the grandfather clock keyhole. The system was able to track people in the room and infer how crowded the room was, whether they were big or small based on their height, and how far people stood from the clock. This enabled the system to broadly distinguish between adults and children, as well as quiet and busy moments, and generate different projection patterns depending on the nature of visitor presence in the room. When children (i.e. small-in-height visitors) were sensed, the Borrowers would appear. If the tracking technology sensed taller visitors, the characters would disappear and remain hidden. Similarly, it was more likely for the Borrowers to be active when the room was less busy and, conversely, remain hidden or pretend to freeze when the room was crowded. The installation ran continuously; no buttons or other mechanisms were obvious in the room to trigger its operation. Therefore, it favoured 'continuous interactions' and 'visceral interrelationships between multiple users' (Snibbe & Raffle, 2009) rather than the more commonly adopted paradigm of 'discrete interactions' between users and technological interfaces in museums (p. 1449).

Methodology: Designing for and Understanding Slow Interactions

The Borrowers installation was informed by a mixed method RtD approach. This combined the development of an artefact, an augmented reality installation, to inquire into alternative forms of interaction for young people in museums. Frayling (1993) described examples of RtD as 'development work … customising a piece of technology to do something that no-one has considered before and communicating the results' (p. 5). Zimmerman et al. (2007) described the approach as creating artefacts that produce 'novel integrations' of research to make a product that transforms existing worlds 'from a current state to a preferred state', generating exemplars of theory and practice (p. 493). The RtD approach in the case of the Borrowers focused on demonstrating an alternative approach to current interaction design for museums, supporting young people, families and teachers to experience a slower, more open reflective engagement with the story.

In December 2010, when the exhibition had been open to the public for six months, a study was conducted with visitors and learning facilitators using qualitative interviews and observations. These ethnographic methods were considered appropriate to capture people's engagement with the installation and the Borrowers display. In this process, Bilda, Edmonds and Candy's (2008)

framework for understanding engagement with interactive spaces and exhibits as adaptation, learning, anticipation and deeper understanding was also useful. We conducted 16 hours of ethnographic observation and nine exit interviews with family groups of between two and four people, across two weekends. We observed five hours of school and family-based learning activities within the Borrowers room and across the exhibition.[2] One-hour semi-structured interviews were conducted with the duty manager, assistant curator and three learning facilitators. Ethnographic field notes were taken from observations and discussions with eight front-of-house staff. The data collected were thematically analysed (Clarke & Braun, 2014) to understand how the technology supported particular kinds of social and reflective experiences with archival collections and museum settings. Drawing on this material, the following sections outline two key themes that emerged in the study: the role of facilitation for intermittent and anticipatory interaction, and the role of slowness in embodied curiosity and co-constructed imagination.

Facilitation for Intermittent and Anticipatory Interaction

In their study of how children experience museum space, Hackett, Procter and Kummerfeld (2018) argued that the physicality of the museum environment plays a significant role in how families come to be together in the museum as the 'material design of space becomes entangled both with children's embodied explorations and their social encounters' (p. 9). In the case of the Borrowers, augmented reality installation, the material design, and more specifically, its apparent lack of materiality, had a significant effect on occasional family visitors, who were observed to not fully engage, or, indeed, notice the installation unless prompted by a member of staff. Rather, young people and their families were immediately drawn to bright colours, sounds and highly stimulating analogue interactive content elsewhere in the overall exhibition space. Although moments of shared experiences, reflection and discussion among families were observed, these were brief, and the intermittent nature of the interaction was often missed. While the ubiquitous character of the technology and the sense of surprise were important aspects of the intended narrative of the installation, and accurately reflected the book's main idea (i.e. the Borrowers only come out when they are least likely to be spotted), the subtle and intermittent nature of the projection, and the rather subdued design of the specific room, created a friction between the 'imagined use of space' and its 'embodied experience' (Hackett et al., 2018, p. 12) among casual family visitors.

Conversely, the facilitated school and family sessions enabled a very different social and physical exhibition space to emerge through the interactions between young people, family participants, the

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[2] Due to local institutional policies related to privacy, no photographs or audio/video recordings were taken during those sessions. The observations were recorded using field notes.

installation and museum facilitators. Although there has been much recent work on the importance of involving and designing heritage experiences with young people (e.g. Hall & Bannon, 2006; Iversen & Smith, 2012), the role of museum facilitators in providing additional scaffolding and storytelling in augmented reality and calm technology installations in museums has been less explored. However, in the context of augmented reality technologies to support children's learning in the museum, Hall and Bannon (2006) highlighted 'the need for expert help present to assist children' (p. 241), while Tscholl and Lindgren (2014), Taylor et al. (2015) and Price et al. (2016) acknowledged the role of parents, gallery interpreters and teachers respectively, in supporting children's engagement through conversation and suggestions. In the Borrowers room, facilitators' contributions were essential for crafting introductions and co-constructing meaning for young people to connect them with the archive and the story. While each session included an age-specific contextual introduction to the exhibition and the Borrowers' story, they were each adapted to the specific expertise of the facilitators and required ongoing improvisation for the specific age group and their potential interests. This was considered important for staff who recognised that many children and adults would not necessarily know *The Borrowers*—which was initially published in the 1950s with very few contemporary renditions—and so the room may have not immediately engaged them or even made sense to them.

In those facilitated sessions, the Borrowers room, as well as other adjacent exhibition spaces, was mobilised by the facilitators in storytelling and interaction-setting. For instance, learning facilitator Laurie[3] utilised the space outside the Borrowers room and the slowness of the technology to conjure a sense of anticipation by encouraging the children to behave in a way so as not to frighten the characters that they had not yet seen. Working with a small group of nursery children between the ages of four and five, accompanied by five adults, she combined details in *The Borrowers* with references to Santa, to bring the characters into the here and now of the children's lives. This balanced the suspense and excitement of something about to happen, with the immediacy of the particular seasonality, connecting it to the children's familiar worlds:

> She brought the group into the main exhibition space and asked them to sit on a carpeted area near the Borrowers room as she sat on her knees facing the children, away from the view of the installation. Since the session was in December, she asked the children if they would be Santa's little helpers because there were some presents for some little people and she needed help to give them out. She explained that the people were very small and carefully took *The Borrowers* book from a sack. Laurie gestured with her finger and thumb the Borrowers' small size, and asked the children to do the same, describing and performing how they borrow people's things and make them into new things, and how they might be frightened of people. As they headed into the room, she explained that if the children were

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[3] Pseudonyms have been used in this chapter.

careful and quiet, they might just see one, as she crept with fingers on lips encouraging the children to do the same.

Conversely, learning facilitator Casey focused on more active detection of key features of the exhibition as a prelude to engaging with the Borrowers. For Casey, this was a way for 'kids to get excited about manuscripts and illustrations … and excited about reading', key objectives in the Seven Stories exhibition and facilitation strategy. She worked with a family group of 15 children between four and seven years old with adults including parents, guardians and grandparents. Here, the emphasis was much more on the use of props to encourage children to physically interrogate the rooms and their visual features:

> Before children entered the exhibition, Casey gave out magnifying glasses. Once in the exhibition space, children were asked to use their magnifying glasses to look for the Puffin logo, which was a way of accustoming children to looking closely for small details. When she led them into the Borrowers room and asked them to look out for some little people who might be hiding, almost immediately the children began to point and shout that they had seen them. They crowded around the specific places on the wall with their magnifying glasses where the Borrowers had been seen. Casey encouraged the children to look closer at the details of the framed illustrations with their magnifying glasses when they were waiting for further appearances from the Borrowers.

These anticipatory aspects of facilitation also made use of the facilitators' personal responses to the sense of uncertainty with the technology.[4] Facilitator Beth highlighted the 'unpredictability' of The Borrowers installation as a defining characteristic: 'you're just not sure when they're going to appear'. This uncertainty was described as a key benefit, mirroring the 'secretive' nature of the Borrowers and underlining the playful hiding aspects of the story. However, it also meant that facilitators felt they needed to play with the installation themselves and learn how to accommodate it in their facilitating practices. When discussing how they had developed their approaches, Laurie described how she had learnt that it was important to introduce the children to *The Borrowers* book before they went into the room itself and spotted the characters. She did this by encouraging children to start 'perceiving themselves as giants', a familiar character in stories that she hoped they could relate to, and help them 'step into a picture, step into a character'.

This highly curated framing prior to entering the Borrowers room was developed and individualised by facilitators who had learnt that to attempt to do this in the room would be, as Beth suggested, 'fighting a losing battle … because you get lost in the whole craziness of excitement' when the children spotted the Borrowers. In this respect, the variability of interaction afforded by The Borrowers installation enabled what Hackett et al. (2018) called 'chance of space' (after Massey) to

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[4] Training on how the augmented reality interactive installation worked and the assumptions embedded in its design was provided to all learning facilitators by the research team at the time of the installation.

be materialised differently each time through embodied physical and social interactions among the session participants, the facilitators and the physical environment and its augmentation.

Embodied Curiosity and Co-Constructed Imagination

The connection between the story and the interactions afforded by the installation was clearly demonstrated when the Borrowers were noticed by visitors, which always led to an elevated level of shared excitement. Adults responded by pointing and encouraging their children to physically look for the Borrowers. Children responded to this by actively looking for them, using their whole bodies to interrogate the space, searching the physical aspects of the room implicated in the augmentation such as the clock and picture frames on the wall, or trying to peer underneath the floor (see Figures 2 and 3). Children's intensive bodily interaction and physical engagement with augmented reality installations in museums is reported in many studies; Snibbe and Raffle (2009) and Price et al. (2016) delved deeper by providing suggestions on the design of specific aspects of the technology, such as the use of shadows and symbols to facilitate the mapping between actions and system responses to encourage physical engagement. Their insights, however, reflect their focus on whole-body interactive immersive systems that are designed to generate audiovisual feedback to explicit user actions rather than subtler forms of slow augmented reality systems such as The Borrowers installation, which did not explicitly aim to encourage intricate physicality.

Figure 2: A child peeks under the floor of the exhibition space next to the grandfather clock near where he has observed a Borrower. Source: The authors (Copyright).

Figure 3: In the same session, another child searches behind a curtain to the side of the illustrations when he cannot immediately observe a Borrower. Source: The authors (Copyright).

We also observed young visitors being carried away by their physical, embodied and immersive engagement with the space afforded by the installation: for example, when facilitator Laurie brought young children into the Borrowers room with finger on lips, creeping and crouching, encouraging them to follow her actions:

> Once in the room, she asked them to sit down and point when they thought they might have seen a Borrower. After a minute of children looking around, she told the group that the Borrowers might not come out because the group might be too loud, and she asked them to put an invisibility cloak over their heads, but to keep on looking. The attentive children copied Laurie's action of putting the cloak over their heads while swivelling their heads round to keep watching. A child broke the hushed concentration and shouted 'There. There!' and pointed when he saw the Borrowers on the wall, to which the rest of the children began to squeal. Laurie asked them 'what would you do if they stole your socks?'. The children were so fixated on the wall with the grandfather clock and on spotting Borrowers, shouting and pointing when they saw the characters, that they didn't answer her question.

These evidently embodied responses were also common in older children; however, they often focused on making sense of what was real and what was make-believe:

> After Casey's facilitated session, discussed in the previous section, and once the group had left the Borrowers room, one of the girls aged seven returned to the room five times while the rest of the group were engaged with activities elsewhere. The girl continued to look for the Borrowers with her magnifying glass on the floor and walls and shouted to other children in another part of the exhibition when she had seen one. A couple of older girls came into the room with an older adult and tried to convince the younger girl that 'they're just a projector that's making the pictures. They're not real', but the younger girl responded by

saying 'no, that's just there to let us know that they're there'. The two older girls continued to try and convince the young girl that it was not real, but she refused to listen, shaking her head and saying no. The researcher encouraged the younger girl to knock on the wall to see where they were hiding. Both the young girl and one of the older girls knocked on the wall where Pod was seen before; this brought the girls closer to the wall, and inadvertently outside the camera's field of view. At that point both Pod's and Arrietty's heads popped up above one of the framed illustrations and the girls all gasped and laughed.

Other observations captured more elaborate embodied explorations of both the projections in the installation and the overall physicality of the Borrowers room. These explorations often appeared to contravene the spirit of *The Borrowers*, but they aligned, we argue, with children's curiosity towards unfamiliar and novel technology:

On the same occasion discussed above, one of the older girls poked the top of the Borrower's head with her index finger and her friend copied. They moved their fingers down so the projection was on their fingers and hands and they tried hard to push each other's fingers out of the way—a behaviour also observed by Rowe (2014) in augmented reality projection mapping museum installations of creepy crawlies. The smaller girl stretched up to reach the Borrower with her magnifying glass to look at it more closely. Shortly after this, one of the older girls and the younger girl left. The older adult asked the remaining girl: 'Do you want to go anywhere else? Do you want to have a look round?'. The girl replied 'No. I want to stay here. This is good'.

Despite the apparent success of the engaged interactions during and after facilitated sessions, it is worth acknowledging that for some facilitators and family visitors, it was difficult to see how sensors and, consequently the projected animated figures, were responding directly to people in the room. Visitors were observed trialling possible trigger actions, such as knocking on walls. However, serendipitous interaction with the technology through unanticipated encounters proved particularly effective in supporting belief in the characters as sentient little beings going about their daily lives. This was evident from visitors' actions beyond the immediate moment of interaction with The Borrowers installation. For example, some message board comments and drawings in the Borrowers room directly referenced specific aspects of the installation, such as Arrietty carrying a pencil. Further, museum staff noted that some visitors left small gifts for the Borrowers in the installation space. These often fleeting and more anecdotal insights further highlight how people engaged with the overall environment of the installation, reflecting and responding to what they saw through embodied curiosity, sociability and imagination.

Discussion—Designing for Dwelling and Reflective Augmentation

The study of The Borrowers installation suggested that slow augmented reality technology in museums cannot be understood outside its social spatial and artefact ecology. For example, focusing only on the interactions between the installation and the young people would disregard consideration

of the richness of the experience emerging from the initial anticipatory practices of the learning facilitators outside the room. Similarly, examining only the interactions of occasional family visitors would have obscured the sophisticated level of engagement that took place in the facilitated sessions, which encouraged many young people to step into the roles of the children in the story, returning repeatedly to see if the Borrowers were there and continuing to reflect on their miniature worlds once the sessions had finished. The study also highlighted the indivisible, and somewhat conflictive, relationship between the space imagined by the augmented reality installation design and the physicality of the Borrowers room, which was materialised through a parallel but separate design process from that of the installation. As Hackett et al. (2018) noted, the materiality of the exhibition is important for facilitating specific kinds of social encounters within physical space (see also Hindmarsh et al. [2002] on the idea of museum physical and technological assemblies). The study indicated that although the room incorporated opportunities to spend time in the space, in the form of a writing shelf and pens and paper, their arrangement facing away from the Borrowers projection did not necessarily offer opportunities for more social interaction and co-constructed reflection. In this respect, the Borrowers room gave the impression that it was designed for 'use' rather than 'presence', a key distinction in slow technology (Hallnäs & Redström, 2001). The facilitated sessions with the installation created the conditions for the materiality of the room to be re-imagined, as the floorboards, frames and skirting boards became the interfaces of the children's imagined worlds, through the viewers' embodied actions of looking, pointing, crawling, poking and stroking, sometimes for prolonged periods.

In this complex ecology of abstract, physical, social and embodied dimensions (Hackett et al., 2018) of the Borrowers room, dwelling emerged as both a key challenge and an opportunity to understand visitors' experiences with *The Borrowers* installation. Dwell time is often used to measure visitor engagement in museums, while interactive technologies have been shown to increase visitors' dwell time without necessarily extending their engagement with the museum environment (e.g. vom Lehn & Heath, 2005). In museum literature, dwell time is explained as the length of time visitors spend in the gallery. Hallnäs and Redström (2001, p. 203) also reflected on the idea of time in slow technology and suggested that the distinction between fast (i.e. task and/or activity oriented) and slow technology is not about 'time perception' but 'time presence' as the slowness of the technology extends 'the moment of [its] explicit use to longer periods of time associated with dwelling' (p. 201). Viewed this way, dwell time engendered by the slow and calm nature of The Borrowers installation is not the result of visitors *spending time* interacting with the installation but instead is the visitors' way of *making time* for new reflective experiences of the Borrowers.

Dwell time in the Borrowers room was also configured through embodied interaction. The installation itself required a slowing down of movement to come to its own, while at the same time, the physical design of the room—for example, lack of cushions and soft seats (see Hackett et al., 2018)—and the apparent invisibility of the augmentation encouraged quick moving behaviours among family visitors. In this context, experiences of 'anticipation' crafted by the learning facilitators gave permission to young visitors and their families to expand their accumulated 'history of interactions' (Hale, 2012, p. 198) with museum environments and museum technologies, often connected to task-oriented digital experiences, and negotiate novelty and familiarity necessary for 'achieving emotional and intellectual impact' (p. 199). Dwelling behaviours among children and their families emerged through the social and embodied interactions with the learning facilitators and the museum space, comprising both the physical architecture of the room and the interactional opportunities offered by the installation. Similarly, the augmented space of the Borrowers room emerged reflexively through the dwelling and movement behaviours of its visitors. In the case of The Borrowers installation, this was evident not only through the children's physical dwelling in the room, but also through their repeat engagement with the room during their visit, to check the Borrowers' whereabouts and to bring them gifts, suggesting a reflective and empathetic engagement with the Borrowers.

Aside the moments of reflection among visitors, especially when young visitors' dwelling enabled them to move from their initial intensively physical engagement with the space to different forms of engagement, dwelling had a significant impact on the reflective practices of the learning facilitators. Discussing the experience of working with *The Borrowers* installation for six months, facilitators reflected on highly situated ways of mobilising the characteristics of the technology in their practice. These very situated responses from facilitators were supported by what they recognised as qualitative novel differences between The Borrowers augmented reality interactive installation and other interactive technologies previously used in exhibitions. Beth described this difference as 'its magic and its ability to captivate a whole group rather than support individual interaction. It's truly interactive and useful as a way into the story'. Casey highlighted the difference between previous large interactive installations that usually incurred damage because kids treated it as 'soft play' versus the elusive nature of the Borrowers: 'they're there and then they're not, so they're being secretive and so kids respect it. There's an instant connection between the interaction and the story.' McCarthy and Wright (2004) discussed how unanticipated events can prompt moments of reflection on what may have gone wrong, as a person seeks a sense of fulfilment from the experience. In this sense, introducing slow technology that momentarily disrupted the expectations of the facilitators prompted reflection on how to adapt and work with the technology to suit their needs and the needs of their visitors (see also Chalmers & Galani, 2004). Therefore, the use of 'slow' technology that was

different and unfamiliar to previous experiences encouraged a more sustained interrogation and improvisation with its unpredictability. It also engendered what Odom et al. (2014) called, 'deeper perceptions of value and meaning' associated with museum technology at large (p. 1962).

Conclusion

This chapter draws on the empirical study of The Borrowers augmented reality installation that used the principles of slow technology in a museum context to engage young visitors and their families with the story and materiality of *The Borrowers* by Mary Norton. Key aspects of slow technology, such as dwelling and reflection, were discussed in relation to social, spatial and embodied experiences of the installation. Our own experience and reflections on the study with young visitors and their families suggests that augmented reality technology that adopts principles from the philosophy of slow technology can support emerging trends in museum design that aim to engender reflective and empathetic responses to museum content. We suggest that this RtD investigation, which combined slow technology with augmented reality in the museum context, enables us to reconceptualise augmented reality technology not only as an additional, stand-alone, alternative layer of museum interpretation, but as a means of engendering rich embodied and contextually relevant interactions for young people, their families and museum facilitators that can expand their imaginaries of museum experiences and technology. However, this potentiality of the technology is likely to be materialised where slow technology is developed as part of a carefully designed environment that acknowledges its entanglements with visitors' accumulated history of interactions, and the social and embodied experiences of museum spaces.

Acknowledgements

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