Magical Reality
Children's Magical Realism for New Spatial Interactions

Dr. Tom Schofield

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Magical Reality, presents outputs from research funded under the AHRC/EPSRC Next Generation of Immersive Experiences, comprising:

- **a smartphone app, ‘Magical Reality’;**
- **a toolkit methodology ‘Not Just Digital Knowledge’**
- **4 published papers.**

The project responded to a need in interaction design research for creative, humanistic ways to approach space and place in designing Augmented Reality (AR) A 7-month-long participatory process involved literature experts, archivists, storytellers and children. Working with the archive of children’s author, David Almond, whose magical realist novels blend everyday reality with the fantastical, materials were digitised to become three-dimensional and interactive. Using new smartphone AR technology, we placed them in a walking tour of the landscape around project partner, Seven Stories: The National Centre for Children’s Books.

Magical Reality drew on humanities research into magical realist literature to engage with children’s imaginative resources and their experience of place through a series of co-design workshops. It contributed knowledge to interaction design in how using speculative design workshop techniques with children could inform the development of mobile applications, for the first time doing this in the context of AR and archives.

Focusing on children’s experiences of local places and their use of imagination when prompted by archival materials, findings provided insights for designers on how children perceive the presence of the ‘unreal’ (in the form of digital objects) as an object of horror and fascination (Publication 1). To cultural organisations we showed how ideas from fiction could provide new uses for archive material (P2). To children’s literature research we offered insights into how magical realism might relate to contemporary technologies and what that might mean for the creation of new hybrid texts (P3). We later adapted our workshops, taking them to disadvantaged children in Newcastle allowing them to design their own AR tours.

A scene from one of the magical reality workshops. Children used glowsticks as props to imagine portals to other worlds

ABOUT THE PROJECT

Our project responded to a set of real world challenges around developing new immersive, creative digital work together with cultural organisations. ‘The next generation of immersive experiences’ AHRC/EPSRC call asked creative and humanities researchers to propose new ways of creating immersive technologies like AR drawing on diverse forms of knowledge.

Our research process addressed this challenge by consulting children and young people (and their parents or carers), specialists in a cultural organisation, technical developers and the genre of fiction, ‘magical realism’, for answers. We chose magical realism because like Augmented Reality it blurs the unreal with everyday reality and by doing so transforms our understanding of place.

Through a series of creative workshops, we developed a smartphone app that embedded archival materials in an augmented reality walking tour around our partners’ building, Seven Stories, the National Centre for Children’s books. By undertaking this process we sought to understand not only how we could blend literature and technology, but also how other cultural organisations might undertake such a process in the future.

Lastly, through follow-on funding we took the tools and processes we made and empowered our project partners to work with children in disadvantaged areas of Newcastle upon Tyne, facilitating new kinds of access to the stories and encouraging children to see their environments in new ways.

1. How can new forms of immersive experience locating memory artefacts in space be co-designed with professionals in immersive technologies and cultural institutions?

This research question built on our partnership with Seven Stories and the project provided an opportunity to explore together issues which Seven Stories had identified as a perennial difficulty for them.

2. What new spatial interactions can be created for AR environments inspired by magical realist literature?

Our interest in magical realism was born partly because of the commitment from Seven Stories to the author David Almond but also because of the unusual challenges the genre poses to conventional design thinking, (see our paper Magical Realist Design).

3. How can such new spatial interactions mix cultural collections with the built and natural environment to create new immersive experiences?

We were sensitive to the importance of space and place and sought to make our interventions something that would respond to them without disrupting the experience of others.

This submission combines digital artefacts and written outputs created from two AHRC/EPSRC projects. The first ‘Children’s Magical Realism for New Spatial Interactions: AR and Archives’ was funded under the ‘Next Generation of Immersive Experiences’ scheme while ‘Embedding Magic: AR in outreach’ received follow on funding for impact and engagement.

The digital artefact ‘Magical Reality’ is a smartphone app for iOS and Android platforms and aimed at children 7-14 years of age. The app takes archival materials from the archive of a children’s author, David Almond, and embeds them in digital space with augmented reality (AR) interactions. The process of developing the app was undertaken through participatory workshopping, primarily with children and the methods we developed are a central part of our contribution.

There are then 4 peer-reviewed published papers focusing on different disciplinary aspects of the project: interaction design, children’s literature, and heritage. They focused on:

1. Exploring future directions for designing interactions relating to sense of place

Schofield, T., Bowers, J., & Trujillo Pisanty, D. (2020). Magical Realist Design. In *DIS ’20: Proceedings of the 2020 Designing Interactive Systems Conference*. Eindhoven: ACM.(winner of honourable mention) https://doi.org/10.1145/3357236.3395530

2. The process of developing the app using co-design methods

Schofield, T., Trujillo Pisanty, D., Arrigoni, G., Reynolds, K., & Pattinson, R. (2019). Magical Realism and Augmented Reality: designing apps with children in a cultural institution. In *DIS ’19: Proceedings of the 2018 Designing Interactive Systems Conference*. San Jose, CA, USA: ACM. https://doi.org/10.1145/3322276.3322293

3. Parallels between children's literature and AR

Reynolds, K., Schofield, T., & Trujillo-Pisanty, D. (2019). Children's Magical Realism for New Spatial Interactions: Augmented Reality and the David Almond Archives. Children's Literature in Education, 1–17. https://doi.org/10.1007/s10583-019-09389-2

4.Lessons for the future for cultural organisations commissioning digital work

Arrigoni, G., Schofield, T., & Trujillo Pisanty, D. (2019). Framing collaborative processes of digital transformation in cultural organisations: from literary archives to augmented reality. Museum Management and Curatorship. https://doi.org/10.1080/09647775.2019.1683880

Finally, our toolkit 'not just digital knowledge' was presented at the National Archives conference and to workshop participants in the impact phase of our project and explained how our development process might be replicated by other cultural organisations seeking to work with immersive technology.

BENEFICIARIES:SEVEN STORIES, THE NATIONAL CENTRE FOR CHILDREN'S BOOKS

Newcastle University has a long-term strategic partnership with Seven Stories in the form of the Vital North Partnership. Funded by Arts Council England and the University, the partnership's principal goal since its inception in 2005 has been to make Newcastle a centre for excellence in Children's Literature.

Our project demonstrated to Seven Stories new ways of collaborating around creative digital work. The process we trialled allowed input from potential audiences and digital experts and made new connections within their organisation. We took our lessons and presented them to other institutions at the National Archives conference, through workshops with museums and tech developers and by releasing a tool-kit of recommendations.

seven stories
The National Centre for Children's Books

Participants in a magical reality workshop

Tom Schofield *Magical Reality*

TEAM:CHILDREN'S MAGICAL REALISM FOR NEW SPATIAL INTERACTIONS

The Project brought together an interdisciplinary team of artists, designers, specialists in children's literature and researchers in museums. This mix supported the project's aims to both create new creative outputs using literature archive and to think about how institutions can work to include innovative digital work in the future.

By combining expertise in children's literature, in heritage studies and in art and design we were able to investigate parallels between stories and immersive technology and ensure that our findings were legible to Seven Stories and institutions like them.

The team was:

PI Dr Tom Schofield, Culture Lab and Fine Art, Newcastle University

Co-I Professor Kimberley Reynolds, School of English Language, Literature and Linguistics, Newcastle University

RA Diego Trujillo Pisanty, Culture Lab and Fine Art, Newcastle University

RA Dr Gabi Arrigoni, Media Culture and Heritage, Newcastle University

OUTPUT 1 – MAGICAL REALITY: THE APP

Magical Reality is a smartphone-based Augmented Reality experience that uses newly available features of modern mobile phones to embed digital objects in real spaces. Users of the app rely on a compass to guide them to a set of virtual objects placed in the Ouseburn Valley around Seven Stories. The objects were produced by taking notes and sketches from David Almond's archive and making them both three-dimensional and interactive. A demo video is embedded in the next slides.

In designing the app we hoped to capture some of the features of interest of magical realism (for example the blending of the everyday with the fantastical) and to respond directly to children's perspectives on what was interesting about spaces when seen through a lens of both technological and literary magic.

The value of the app was partly in creating an output available freely for audiences but as importantly, in trialing a collaborative methodology useful to our partners and replicable by other cultural organisations.

In our published work we describe how the development of archival materials into augmented reality objects widens their appeal for new audiences.

It was designed in a collaborative way with knowledge specialists in children's literature and with children themselves. The app creates new kinds of experience of archives influenced by the books' atmospheres and responds to themes from Magical Realism by mystifying the everyday, using unusually slow interactions and developing ambiguous objects open to multiple interpretations.

We believe this to be the first work to relate AR to Magical Realism and one of a very small number of examples (Alakärppä et al., 2017; Kang et al., 2018; Oberhuber et al., 2017) that use AR to critically investigate space and place.

Tom Schofield *Magical Reality*

This video is also accessible via https://vimeo.com/322252023:

Screen grabs from magical reality

Left:
‘Clay’ was taken from a drawing in the archive from Almond’s novel of the same name. When audiences encountered the object the clay ‘dried,’ the longer they looked at it until finally it crumbled to pieces and revealed the original archival paper.

Right:
‘Have you ever seen the dead’ was a note in Almond’s writings for the novel, ‘Heaven Eyes.’ We wrapped the words in virtual smoke and caused them to appear slowly when approached.

Field testing the app as part of Manchester Science Festival. We ran a workshop additional to our work at Seven Stories as part of the festival programme. Here we used an atmospheric space in a cellar beneath the city using it to situate children's stories in response.

METHODOLOGY: CO-DESIGN WORKSHOPS

We conducted a series of 6 workshops and though while each had its own focus, a common theme was to use creative analogies to immersive technology to enable children to express themselves creatively and to respond to this creativity within the design of the app. Ideas of other worlds, magic, the fantastical and multi-dimensionality all featured prominently in our workshops with children. By doing so, we hoped to gain insights for ourselves and our partners not only into the design of the app but also into the value of the spaces and places of David Almond's work.

Through the workshops, we engaged around 80 participants, mostly children but also including professional designers and developers and specialists at Seven Stories. These workshops were planned and implemented by the university researchers, adopting the role of designers and developers, and colleagues from Seven Stories with expertise in archives and collections, exhibition design, creative events and storytelling. They blended approaches from co-design (participant as informant) with more speculative methods incorporating creative arts methodologies.

These different groups had their own interests in the project, for instance the collections staff were engaged with the possibility of developing new uses for the archive materials and we planned to ensure that engagement with the workshops had reciprocal benefits. The workshops formed part of Seven Stories' engagement programme, addressed children within their core audience and provided added value beyond the project.

A boy takes photos of material memories as part of one of our workshops

Planned with colleagues from the collections department at Seven Stories, this session took reproductions of material from the David Almond archive and presented them in a fictional frame.

We described a fictitious archival accession event wherein a stranger, oddly dressed and silent, arrived at Seven Stories bearing a mossy, stained box leaving it with the confused staff. We described how we had come to the conclusion that the box contained remnants from an older civilization once present in the Ouseburn Valley which surrounds Seven Stories (the Ouse is a tributary to the Tyne river in Newcastle.)

Activities focused on identifying the use of the archival items within that civilization and in later stages of the workshop in taking the items outside and relating them to features of the current landscape. The choice to work with ideas of past civilization was inspired partly the emphasis on inter-generational time in some magical realist literature.

Participants imagine archives as remnants of lost civilisations

METHODOLOGY: IMPACT BUILDING

Our workshop series embedded impact from the outset of the project by placing our collaborative activities before involved publics, sharing the aims or our research and soliciting contributions from a range of stakeholders. Additionally we:

- Ran a workshop session involving 10 staff members from different departments of Seven Stories and 5 designer developers from VR/AR studios in Newcastle

- Produced a report for the cultural sector entitled ‘Not Just Digital Knowledge’ detailing the collaborative arrangements of our project and making recommendations for future practice.

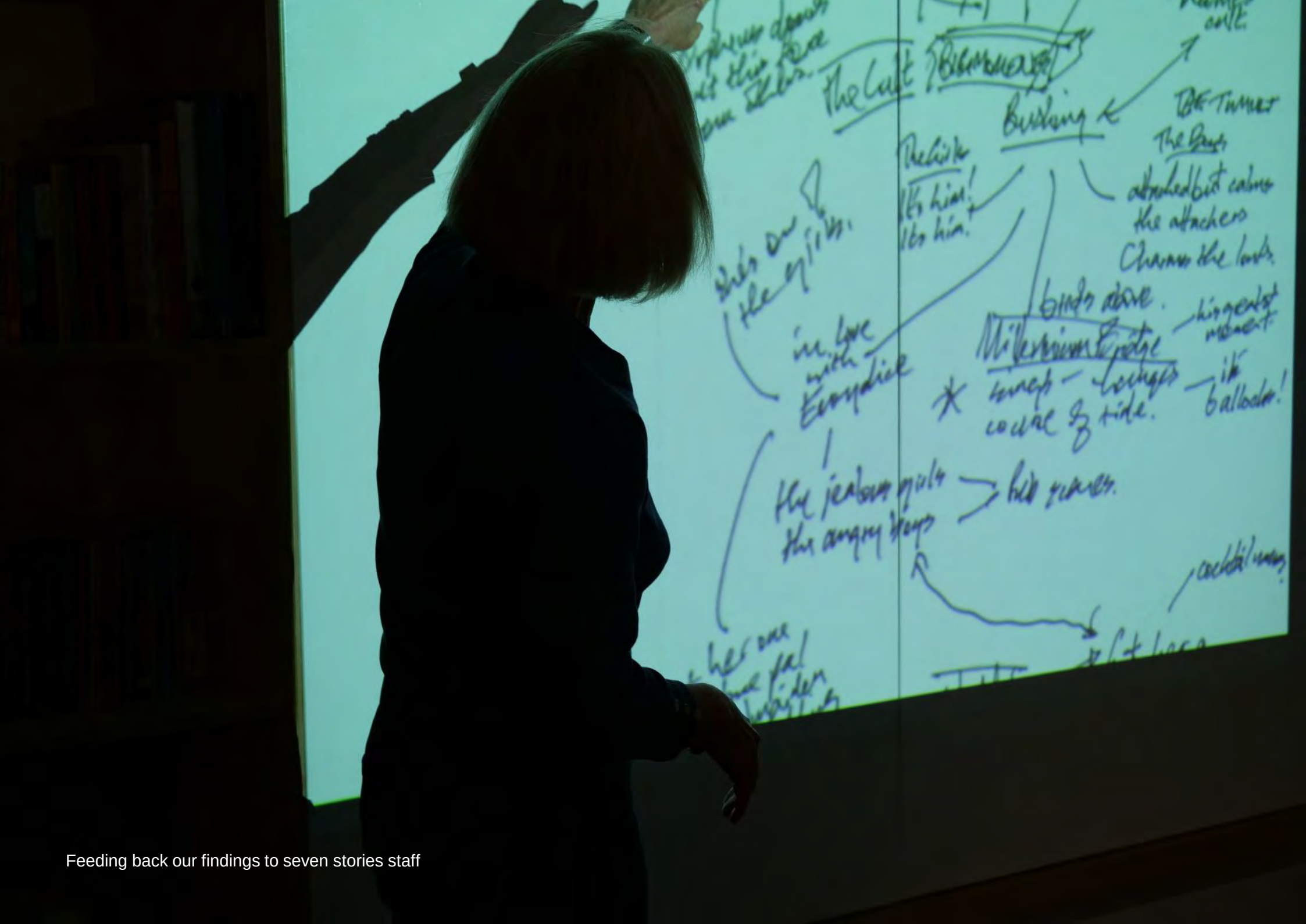
Seven stories staff participating in workshops on material memory and space

Our project demonstrated manageable and affordable collaborative processes for future work between developers of immersive technology and cultural institutions.

We consider the success of the approach we propose to be dependent not only on the quality of the digital outcomes but on the feasibility of the process for the organisations, for designers and developers, and for others engaging in the process, audiences in particular.

For the cultural organisation, our process had the following benefits:

- Enabling specialist staff to input knowledge into the development of the AR app, and develop further their relationships with the audience and their learning experience.
- Inputting into the development of new AR technology, ensuring that the development of such technology is user-centred and not commercialised.
- Affording the opportunity for the organisation to attract audiences and develop a deeper engagement with them through AR technology.
- Developing new forms relationships to the spaces and places surrounding the centre



Feeding back our findings to seven stories staff

We demonstrated the successful application of literary inspiration as way to develop more nuanced expressions of space and place in AR.

Our findings (Schofield et al., 2019; Schofield et al., 2020) included:

- Observations on and recommendation for the dramatization of searching for virtual objects in locative smartphone apps
- Recommendations for the selection of appropriate archive material in using cultural content (such as archival material) in AR
- Examples of new ways of developing atmosphere in outdoor AR

Xploring underground spaces to
imagine new spatial interactions

We received follow-on funding to bring together a new interdisciplinary team. With them, we worked closely with Seven Stories to study how our app could be adapted and used in practice outside of the direct control of researchers

PI Dr Tom Schofield, Culture Lab and Fine Art, Newcastle University (project management, workshop design, app and materials development)

RA Dr Miranda Iossifidis, Culture Lab and Fine Art, Newcastle University (workshop design, ethnography)

RA Dan Foster Smith, Culture Lab and Fine Art, Newcastle University (app re-development)

Elena Miller, Seven Stories (workshop design and implementation)

We extended our workshop series and modified our app as part of Embedding Magic: AR and Outreach AHRC/EPSRC Follow-on Funding for Impact and Engagement Feb-May 2019. These impacts are the basis of an Impact Case Study for this REF. The impact of our project took four main forms:

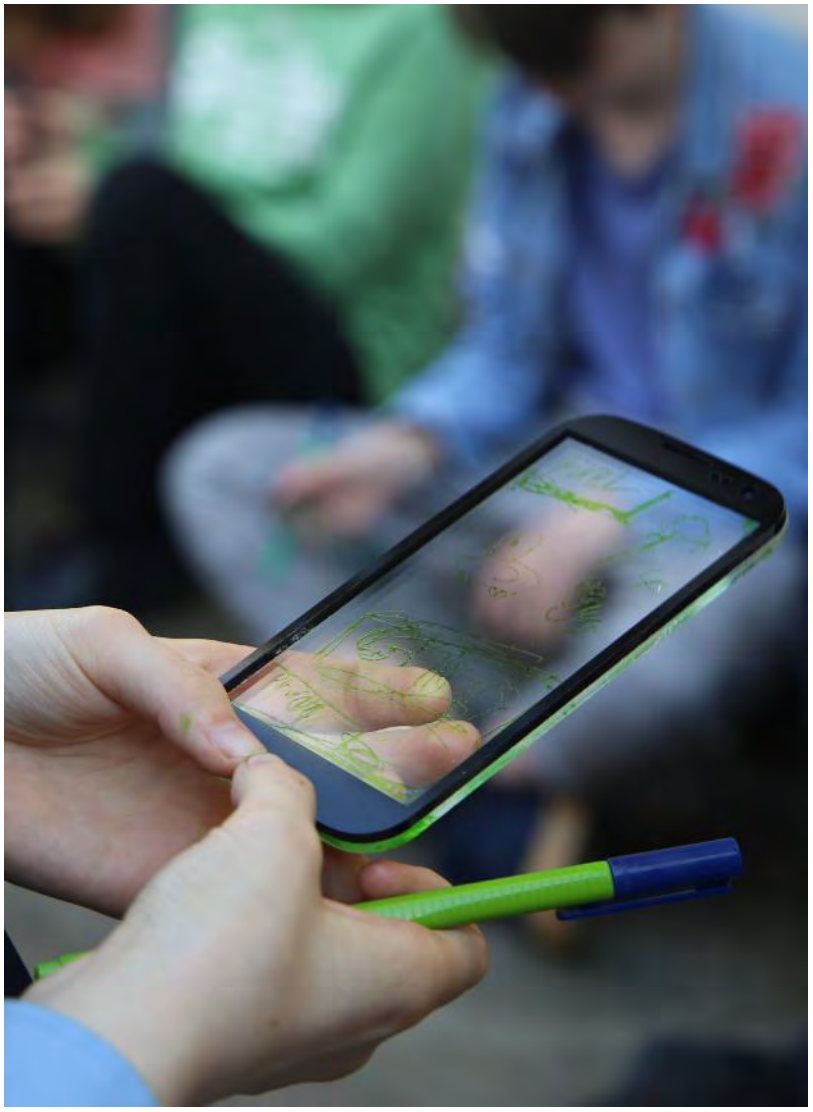
1. **Improving access to archival materials**

2. **Producing new forms of audience experience with AR and archives**

3. **Changing children's attitudes through digital creativity and storytelling**

4. **Expanding the reach and scope of our project partners' activities**

We developed both our app and our workshops into a reusable resource that Seven Stories could take to underserved communities in Newcastle upon Tyne. Children designed their own AR tours of their own communities, filling them with stories inspired by magical realism.



‘Some children aren’t surrounded by books, especially on this estate with the poverty and the reading age is peaking at 8 at the minute for adults. I just feel that projects like the one you’ve done with Seven Stories are so important to connect people into that literature. The way you did it as well; you didn’t shove a book in front of children and say ‘now read this’. You brought it to life […]’.

(Community centre leader in Byker)