

Working with young people at the margins of society to design hybrid physical/digital objects to portray their experiences of support services.

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Abstract: Telling the stories of people that have come through the care system is an important task, not only to let the wider public understand the issues that these people face but to help those on their way into the care system as well. These transformative stories written and researched by those same young people that have traversed the care system, required a novel method of portrayal. To that end the young people were given tools that enabled them to help in the design of physical/digital hybrid objects that would allow people to truly interact with the stories. This paper discusses how the research team approached giving the young people those tools and the outputs that those people then produced. By enabling the young people as co-researchers a further depth of discovery was achieved that wouldn't have been possible without that same input.

Keywords: Design Research, Co-Design, Participatory Design, Empowerment, Storytelling

1. Introduction

This research is part of a larger project addressing the concerns and experiences of young people in care or those dealing with other difficulties/disabilities and in particular the issue that they have things to say but often lack the means to be heard (Rose & Shevlin, 2004) (Satchwell, 2016). Unfortunately, media stories often reinforce and actively construct negative perceptions about these young people and even when such characters appear in literature they are often portrayed marginalized or stereotyped. This lack of voice from their own perspectives erects barriers to improving their own lives and for engaging other young people in similar situations.

To address this, we are enabling a group of young people who are being supported by the Charity Barnados to collect, create, and share their own experiences and the experiences of other young

people. As none of the young people have engaged in such activities we needed to create a research approach that enables them to not simply be the objects of study but rather facilitates them to become co-researchers by moving beyond co-design methods, and give them a voice in helping shape and direct the research as suggested by (Southern, et al., 2014). To do this we have been organising a series of activities to empower them with ways of collecting personal stories from other disadvantaged young people in a sensitive and ethical manner. We have then worked with writers who facilitated workshops that showed them potential ways in which these personal stories can then be turned into fictional narratives that still convey the essence of the experiences. In the final stage, they will help design playful hybrid physical/digital or Phygital (Coulton, Playful and gameful design for the Internet of Things, 2015). Note that the term phygital is used as a way of emphasizing a class of objects that have not simply had some digital functionality embedded within them but are connected devices whose functionality and operation is designed to exist simultaneously in both virtual and physical space (Coulton, Burnett, Gradinar, Gullick, & Murphy, 2014). It is envisioned that phygital objects will enable the young researchers to spread their stories to a wider audience in ways that go beyond traditional computers, tablets, and phones. In this paper, we are primarily concerned with the challenges and resulting approach of ways of working with the young people to design novel phygital devices using technologies they are likely unfamiliar with.

Working with the group of young researchers, we identified key aspects that they would like to portray from their stories and gave them examples of how we could bring these ideas to life as phygital devices. This required regular interactions whereby we could gauge their abilities and help them achieve their aims and allowed them to have direct input into the process of the research and the design of the Phygital outputs.

To further the young researchers contributions, they were provided with the conceptual and physical building blocks through which they could prototype their own phygital devices. By using the principles taught to them, they were asked to design something that would help to tell their story, for which we emphasised there was no wrong answer. The outcomes were multiple imaginative creations that ranged from video game systems where the stories were games on the system, to poetry clouds that would read aloud the young persons' inner monologue.

A number of these concepts were built and then taken back to the young researchers to gain their insights and suggestions for improvement. In the following sections, we will detail this process along with discussing the future activities of the project.

2. Enabling Young People as Co-Researchers

Through the use of co-design principles (Sanders & Stappers, 2007), a great many things can be achieved through our lenses as researchers. However, this process can be biased by the values and experiences of the researchers ultimately leading the participants to the point where researchers would like them to go. In this project the aim was to enable the young people not only to be workshop participants, contributing to the project, but to be empowered to act as researchers in their own right, working in a research group proposing and discussing different options, prototyping objects and creating final designs that could be worked up into final phygital outputs that could then be used in public settings to help engage people with the issues affecting young people in the care system.

2.1 Understanding Everyone's Abilities

The first steps in enabling the young people to take part as co-researchers involved gauging their abilities and the design of a process through which they would be able to contribute actively to the project. The abilities of the group varied wildly, with some of the group excelling at drawing and others more writing focussed. It was important therefore to not hamper the skills of some by creating a process that catered to one but not all. Hence, we created a series of activities whereby the young researchers would be able to draw, write or build their ideas with the support of helpers from the greater research group and volunteers from the charity Barnados where needed. The timescale of the process had to also fit in with predefined durations due to time commitment issues, as the Young Researchers needed to travel to and from drop off and collection points so that the charity workers could arrange travel to the venues. This led to a series of tasks that would contribute to the groups research by allowing the young people to explore their own ideas within the space of a few hours. This had the added benefit of keeping everyone's attention through to the end of the day.

The process of understanding the Young Researchers began at the regular meetings that were held between the Lead Researchers and the Young Researchers at The University of Central Lancashire. Over the course of several months we interacted with the group performing different tasks from explaining our role within the project, to helping them with their own work as part of the overall research aim of enabling them to collect stories of resilience from other young people from within the care system. Through these meetings friendships were created and understanding of each other was gained which allowed for an easier interaction with the group.

Working in the research group and with the young researchers it was determined that the best way for the young researchers to contribute to the design of the Phygital outputs was to actually build them in prototype form. As they had limited knowledge of what a Phygital could be we produced some examples and explained that Phygitals are physical and digital hybrids using novel interaction methods that change the way we look at data. To give them the opportunity to build these prototypes a workshop was planned that would allow them to explore their creative options.

2.2 Planning the Workshop

During the previous sessions where we were introduced to the Young Researchers, took note of what the key aspects of their sessions were. Keen not to re-tread old ground with them but also not wanting to stray too far from their norm. There were several factors that seemed to be common across all sessions and that seemed to help keep the Young Researchers on task, these were:

- Short tasks
- Frequent Reflection
- Long Lunch
- One to one help where needed
- Scribes
- Snacks
- Easy to grasp concepts
- More physical interaction over verbal discussion
- Quick introduction and exit games

The use of these points in the workshop were very helpful as they were used to manage the team and keep them on track without too many distracted moments.

2.3 The Tasks

Using these ideas an agenda was created that incorporated them and then expanded on the form with tasks that would help us to understand what it was as a group we were looking for in our Physical/Digital objects. As discussed previously an introductory game was typically used in other sessions, however rather than play a “name game” in which people chose a name a name from the group at random to help remember everyone’s name and as a way of letting new people enter the group, a more creative approach was sought to help frame the workshop in a different light. To that end, approximately twenty-five bust-silhouettes were cut out using a laser cutter, then named and would be used by a different person to draw the person named on the cut out, using their non-dominant hand. The use of the non-dominant hand was done deliberately so no one felt they would be judged on their drawing skills and because it the fact that the workshop was meant to be fun. The group can be seen through the guise of their cardboard avatars in Figure 1.



Figure 1: The researchers together with their off-hand drawn portraits

Following this the group were given a breakdown of the day and asked if they had any changes they would like to make to the agenda. Allowing them to change the plan if they felt it wasn't suited to their requirements. This was important so that they felt engaged with the process rather than it being something they were simply going along with.

The main activities of the day would be two physical construction exercises where each of the Young Researchers would be provided with building blocks (pre-cut 3D cardboard shapes of various sizes and colours) they could use to construct their vision of a Phygital object that could be used to tell their stories. Along with the blocks a myriad of items from cotton wool to stickers with dials and displays would be available to use some of which can be seen in Figure 2.



Figure 2: Selection of crafting supplies and ephemera

These activities will be interspersed with reflection times where the group shared their ideas and discussed possible alternatives. After lunch the young researchers were tasked with either fully fleshing out their current design or to start anew with a design incorporating ideas from the others reflections on their work.

To end the day a short reflective session would be held where the group could discuss the outputs of everyone and highlighting the key aspects of the objects so that they could later coalesce into a single unifying object.

Running the workshop had its stressful moments, but on the whole it ran well and the outputs from it speak for themselves. Each of the Young Researchers truly tapped into their imagination to create objects that could be used to confer their messages to others in the wider public.

3. Workshop Outcomes

As discussed in the previous section the workshop consisted of several separate events, designed to engender the Young Researchers creative side and to help them on their way to build unique Phygital objects. In this section, we will highlight a small sample of what was created on the day but also our reflections on how we could accommodate such a myriad of ideas within the resource constraints of the project.

3.1 The Outputs

There were a broad range of outputs, beginning with a dream cloud that lights up with different colours representing different emotions/feelings and recites via headphones the associated person's soliloquy. This device was unilaterally liked by all of the participants, particularly for the expression of the person's inner most thoughts.



Figure 3: Soliloquy Cloud

Another output was a bit more traditional in many respects and the designer created a type of video game console, but one which would be able to play games based upon the Young Peoples stories where they can explore their worlds and story in a more interactive fashion.



Figure 4: Portable gaming system with aerial

Taking a different tangent, one of the Young Researchers built a smart home that included safe spaces and an inbuilt entertainment system that could be used to tell soothing stories to the people within it.



Figure 5: Some other outputs of the workshop

3.2 Extracting the Outputs Key Aspects

Obviously across the entire project there are common themes such as the requirement to express a version of a story of a young person's resilience. However, the approaches to this by each of the different outputs ranged from fully immersive virtual reality to portable story players in the guise of iPods. The team was keen to build as many different objects as was possible though due to time considerations we would have to limit the final creations to a maximum of two. So, by extracting the idea of the design of the cloud and combining that with the knowledge box theme along with other key components of the projects such as portability and interactivity the team collectively arrived at the idea of building a portable suitcase. The suitcase would include an object based interaction where users would be able to move their chosen object onto a cloud which would then queue a story to be played via speakers and a screen.

The objects would be chosen by each of the Young Researchers by what would best represent their story. This would then be 3D printed and placed into the suitcase for later use. This method of pairing objects with stories is a form of a 'Memory Box' as suggested by (Frohlich & Murphy, 2000). Unlike their example, the objects would not be gifts to the end user but in fact would be replicas of items that hold great value to the Young Researcher whose story it is attached to.

The second of the two outputs chosen for production was the smart home, while the production of an entire smart house is outside the scope of the project the group decided it would be possible to scale this down to a dolls house size albeit with functioning screens and speakers for the output of the stories. In this design the idea would be that there would be 3D replications of the Young Researchers that could be moved around the different rooms of the house and in this way, different stories could be played based on their locations.

Discussions of these options with the group highlighted that though these were not their original ideas, they would be representative of the groups combined ideas.

3.3 Design of The Suitcase

With the workshop over, the build phase of the research began. Using the key aspects identified in the previous section of:

- Must be portable
- Able to play a range of different stories
- Interactive through 3D objects
- Have a display

In order to meet these criteria, we looked at several approaches but settled on embedding a RaspberryPi inside a suitcase with a Near Field Communication (NFC) reader attached to it. The reader would then be able to read the data from NFC tags embedded within the 3D printed objects and by using their individual id tags play the associated story. The build itself was relatively straightforward, it was the procurement of the right suitcase that proved difficult, though a lucky find at an antique centre garnered a 1950's leather Samsonite suitcase, with a well-travelled aesthetic to it. Keen not to change the look of the exterior a frame was fitted to the inside of the lower half of the suitcase which would be used to house the electronics. To fit the screen, distressed wood and brass screws were used to create a steampunk-esque look to match the suitcases hardware. The result of this can be seen in Figure 6.



Figure 6: The Traveling Suitcase

4. Group Reflections

Following the build of the suitcase it was taken to the next group meeting where everyone could offer feedback and ideas for improvement upon the design. Initial reactions were very positive with nearly unilateral support for the current design. There were one or two that voiced the opinion that because the inside was housing modern technology that the exterior should also match that style. Though they conceded that perhaps there was a place for both and given time that a more modern styled version could be created. After the initial introduction to the object the group brought up new ideas that could be used to improve the suitcase to make it suited to more occasions. These ideas began with the potential to add a micro projector to the side of the suitcase enabling it to show the stories to larger groups of people, to which there was some support from the group however they

felt it would work better on the more modern design. There were also design changes that the group felt it was important to make. One of the group said,

“There is a problem, we can't see it unless like twist it right up if you get me.”

Due to the fixed nature of the screen it was very difficult to see it from a low level so a decision was arrived at that the screen would be able to be tilted up with a bellows/concertina effect at the rear hiding the lifting mechanism. Another of the group mentioned that they had trouble hearing the audio from the story and suggested that perhaps a volume control system of some form would be good, perhaps even including a headphone port for more personal/sensitive stories.

“Like a little scroll wheel that turns up and down”

Upon seeing the device one of the group remarked that it would be good to be able to play different parts of a story based on the object you placed on the cloud.

“That two, in two bits and then or one in the first bit and then the other bit.”

In this way, you could play a story out of order allowing for some gaming elements in the way in which people interact with it. The final suggestion that came out of the conversations with the group was that the objects should be stored within special alcoves within the top half of the case. And that these alcoves should light up when the suitcase is ready for a story to be played.

5. Conclusion

Throughout this stage of the research project the Young Researchers have been instrumental in the design and the ideas behind what we have produced, both on the phygital design of objects and the gathering and creation of their stories from the others in the group and from other Young People who have been through the care system. While these devices have not yet been tested for their efficacy of conveying the Young Researchers tales, they have been successful in helping them understand the different ways in which they can interact with the world to inform them about their lives. Their comments throughout the feedback session, showed their surprise at the fact that what they had collectively come up with the barebones of, becoming a reality.

The design of the workshop was instrumental in bringing the Young Researchers to the point where they felt confident to create these objects, and while the final objects are not 100% recreations of their ideas they do borrow a part from several of their ideas to create a team object that is greater than the sum of their individual ideas. But the creation of the workshop in and of itself was a team creation born from the interactions with the group for several months prior to the event, without those interactions and the trust that was built up within the team, the workshop would likely not have been as successful.

Creating the safe space where they had the possibilities to build and create whatever they could dream up, without the fear of reproach for giving the “wrong” answer allowed them to be truly free in their creations. While much of the interactions are in the vein of more traditional Co-Design methods the key difference is that the Young Researchers truly have the ability, and do change the direction of the research through their comments and their own research into collecting their stories.

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