Active Parks Design Report

Co-design research report and design suggestions for future development and implementation of an interactive and playful walking trail at Ryelands Park in Lancaster

Active Parks

More information on Active Parks can be found at the project's website:

http://imagination.lancs.ac.uk/activities/Active_Parks

or on the Ryelands Park facebook page:

http://www.facebook.com/RyelandsPark.

Videos and interviews about the project can be found at the YouTube channel:

https://www.youtube.com/channel/UCg6oYqMK_gyCy0gEjpS6AGw

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Active Parks

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Pioneering research and skills

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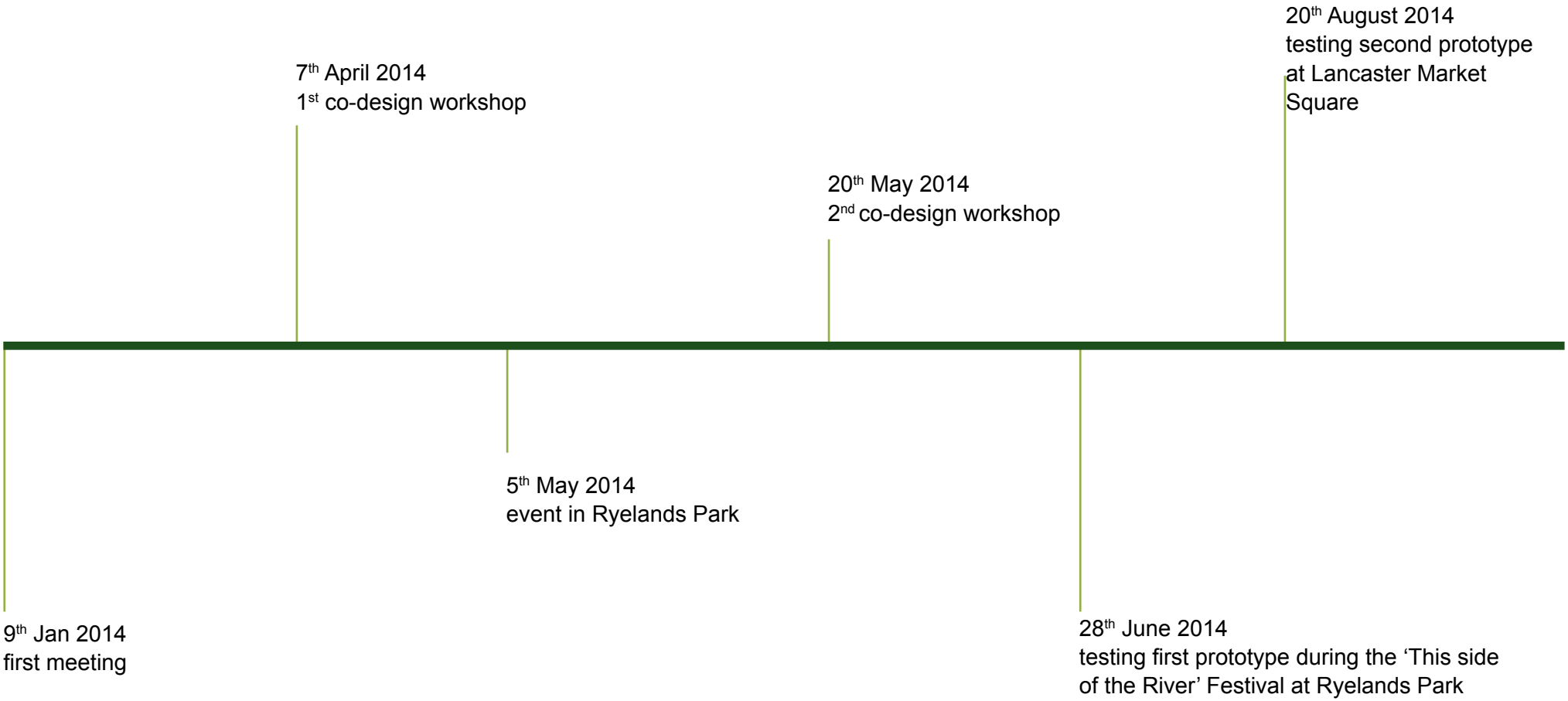
Active Parks timeline



Introduction

The Active Parks is a project aimed to bring together local residents, the Friends of Ryelands Park, Lancaster City Council and NHS Lancashire Public Health to work together to co-design an interactive ‘health trail’ which meets local needs in Ryelands Park, in Lancaster.

The aim of the project was to develop an interactive ‘health trail’, which would offer new ways of motivating and taking physical activity specific to local people in their park. The objective was to address different levels of physical activity which can be fit into a general walk or dog walking schedule and also make use of new technology to link to further information and make the exercising experience more playful and enjoyable.

The co-design activities conducted included two ‘co-design’ workshops with local residents to share their experiences of using the park, and to help come up with ideas. Designers from Lancaster University helped in those workshops to elaborate plans or models of these ideas (prototypes) using creative tools. In addition to the workshops, the Active Parks team held a stall during a car boot sale event at Ryelands Park to further gather data from park users.

The ideas generated during these events informed the design proposition of the health trail contained in this report. The Active Parks team then selected one of these ideas incorporated in the trail design and developed a proof-of-concept digital prototype to illustrate the possibilities and explore further how it could be used and implemented in the park. The outcome of this project is the set of design guidelines and recommendations presented in this report that aims to inform further development and implementation and help in acquiring further funding.

The first part of the project was supported by the Lancaster University FASS-Enterprise Centre and the second part was supported by Catalyst, a research project based at Lancaster University and funded by the Engineering and Physical Sciences Research Council.

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pictures on this page:

1. map of the Kwiek urban exercise route
2. one of the exercise instructions found on the path of the Kwiek route
3. Co-designers working together in one of Active Parks workshops

Background to the project

Ryelands Park is situated in the North area of Lancaster and close to neighbourhoods of Ryelands, Mainways and Vale. People Use the park in their daily lives in activities such as walking their dogs, taking kids to school, jogging, cycling and playing football. There are also communal activities organised by the Friends of Ryelands group such as gardening.

The objective of the project was to increase the level of physical activity people carried out in the park, targeting particular casual users of the park such as dog walkers, parents or other people looking after children and elderly people.

Inspiration

Ideas to increase physical activity and involve communities developed in similar projects inspired Active Parks project. One such example is Kwiek, an 'urban exercise route' in the city of Eindhoven in the Netherlands (Vimeo, 2014). This project made use of urban furniture such as benches and lampposts to help older people exercise. Active Parks was also influenced by the Active by Design report published by the Design Council (2014).

Co-design

One of the guiding principles of Active Parks is to work closely with the local community. Therefore the project used of co-design to engage with users. Sanders and Stappers (2008) defined co-design as "the creativity of designers and people not trained in design working together in the design development process." Co-designing with users has the potential to be transformative as participants become co-owners of innovation, having a much higher stake in its design, making and ultimately use. Co-design has also been used in other research projects with for designing services with users such as older people and in health and wellbeing settings (Steen et al. 2011; Tsianakas et al., 2012; Botero & Hyysalo, 2013).

Digital technologies

The other aspect that characterised this project was the use of digital and mobile technologies to enable the interaction and engagement of users with the environment of the park when conducting physical activities. Such technologies have been used in 'phygital' (physical + digital) games, which offer playful experiences. For example, with mobile phones with GPS/NFC technologies, users connect to the physical environment such as building and landmarks (Iguchi & Inakage, 2006; Rashid et al., 2006; Vogiazou et al., 2006). Romero et al.(2010) explored designing playful experiences targeting older people and Bekker et al. (2010) co-designed playful 'phygital' games.

The technologies explored during the workshops included the use of smart phones, RFID (Radio-frequency identification), QR (Quick Response) codes and NFC (Near-Field communication) technology. Participants were shown videos that introduced and briefly explained these technologies (Nokia, 2014; YouTube, 2013; Common Craft, 2014).


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1st co-design workshop

This was the initial exploratory workshop. The original brief of the project was to co-design with the local community an interactive health trail at Ryelands Park. The objective of the first workshop, then, was to establish the values and goals of that community, in order to better understand the issues that might motivate or impede the engagement in physical activity, as well as to highlight habits and preferences of that community. The activities carried in the co-design workshop were used to enable that discovery and empower the community to express their views. This first workshop could be placed in the 'fuzzy front end' of the design process where the design problem and the brief are redefined.

All participants, including the researchers/designers and community members, were given name badges that said "(space for name) is a co-designer". This was done in order to share ownership and highlight that all had the same status and jobs in this design process. The workshop lasted for three hours with a 30min break for a light buffet dinner. The co-design activities were focused on capturing people's values, needs and aspirations on the type of physical activities they enjoy doing and would like to do in the park. Those activities that are listed and explained below.

Overview

date: 7th of April 2014
location: The Lune Park Children's Centre, Ryelands Park, Lancaster
duration: 3hrs
nº. of co-designers: 9

Icebreaker

Participants were asked to choose one or more photos (among a set of 34 images) that represented the activities they enjoyed doing outdoors and explain to the rest of the group their reasons. Objective of this task was to instigate people to communicate and share their personal values and preferences.

Photo-collage

Participants were asked to create a photo collage as a group of physical activities to do at the park. They were invited to discuss their ideas and use the photos provided or to add their own drawings or words if necessary. One member of the group was to feedback to the rest of the participants in the room, while another member of that group worked as a scribe to capture the mains ideas discussed. The objective of this task was to elicit, sort and negotiate values and aspirations regarding outdoor activities.

Devil's advocate

Participants were asked to work in their groups move from collage to collage identifying problems. They were given have 3 minutes per board to identify and describe the problems they could spot in performing those activities in the park, using 'post-it' notes to annotate them on the collages. The objective of this exercise was to refine the definition of the problem, capturing the problems, worries, concerns and issues participants could identify.

Ups & downs

Participants were asked to identify and agree in their groups on the most important positives and negatives issues expressed in the previous exercises. Each group was asked to summarize the issue in few words and rank them in importance from 1-5 using a flipchart for positive issues and one for negatives. This activity helped the group to identify the most important shared issues, both positive and negative.

Building the trail

Co-designers were asked to considering all the positives and negatives and using Lego to demonstrate the fun exercises that people could do in the park. The groups were asked to create a minimum of 3 activities. At the end of the activity each group presented their ideas back, which were video recorded.

A number of values and aspirations about the creation of a casual activity trail in Ryelands Park were captured. Several themes and ideas started emerging.

picture on page 8:

team working on the building the trail activity with lego

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pictures on this page:

1. result of the photo collage activity
2. photo collages after the devil's advocate activity
3. Lego prototypes of activities ofr the trail

highlights

the activities of the 1st co-design workshop helped to:

- **define the design problem and design brief for the co-design of the walking trail**
- **establish the values for the project**
- **identify positive and negative issues to be dealt with during the co-design process**
- **generated initial ideas about what kind of activities could be included in the trail**


MIND THAT CHILD
Walls
I look after young children
Active Parks
Want a corporate vision
Fear of the unknown
Access to the park
Vandalism
Lack of money - No funds
Lack of use

Co-design participatory exhibition in the park

Active Parks had a stand at the car boot sale event that took place on the 5th May 2014. The car boot sale was seen an opportunity to engage with a large number of people that would already be attending the event at the park, saving time in recruiting participants. It was also anopportunity to discuss the issue of doing physical activities at Ryelands Park on location and gather more data in addition to the data already gathered in the first workshop. The team devised a couple of activities that allowed the public to share their ideas and views on the health trail and the type of activities they would like to do in the park.

Overview

date: **5th of May 2014**
location: **Ryelands Park**
duration: **4 hrs**
no. of participants: **approximatelly 25**

Co-design cubes

There were two cardboard cubes were participants were invited to contribute their thoughts about doing physical activities in the park.One of the cubes was aimed at the three main groups of users identified in the project: dog walkers, carers of young children and older and retired people. This cube displayed some photos of people doing physical activities outdoor (the same ones used in the first workshop) and the asked them to tell us about what actvities they enjoyed doing. The other cube had faces marked with positive and negative issues identified in the first co-design workshop and participants were able to comment or add more issues by sticking post-it notes with their views.

Lego movies

the second activity required a more engagement from participants. Those who wanted could contribute further by creating a Lego movie of a potential walking trail with fun and interactive physical activities.

In a space of three hours we got over 25 unique participant responses from people across ages and groups (dog walkers, people who care for young children, older and retired people). We also got several Lego movies produced showcasing some of these ideas.

picture on page 13:

Active Parks stall during car boot sale event

highlights

the activities of the co-design participatory exhibition helped to:

- **gather more data about what physical activities people enjoy doing in the park**
- **engage with the main stakeholder groups identified in the project:**
  - **People who look after children,**
  - **dog walkers and**
  - **older or retired people**
- **more information on positive and negative issues and values for the project**

picture on this page:

comments on one of the co-design cubes used on the event

picture on this page:
co-designers working
with the constraints hexagon

2nd co-design workshop

While the previous activities focus on exploring issues, broadening the understanding the design problem, this second workshop focused mainly converging or synthesising all the knowledge generated before into design solutions. In order to do that this workshop presented the following activities to the participants:

Overview

date: 20th of May 2014
location: The Lune Park Children's Centre, Ryelands Park, Lancaster
duration: 3hrs
nº. of co-designers: 8

Making sense of the data

Participants were divided into two groups and given sheets with all the data collated from the first workshop in April and the event in Ryelands Park in May. They were asked to group the data into themes and using co-design hexagons identify any connections between the themes. The hexagons were pinned to boards so all groups could shared their work. The objective was to consolidate understanding of the values that emerged through the co-design process and that would guide the next stages.

Defining a Vision

The groups were then asked to look back at the hexagons and come up with few words, or a sentence to express their vision of what the walking trail should be. This activity was the first step into a shared understanding among all the co-designers taking part in this workshop.

Identifying a Shared Vision

Participants were asked to negotiate amongst themselves until a new statement for the vision was reached that all agreed with. They were also required to look back at the values and identify of the vision expressed well those values and if there were anything else that need to be included.

The objective of this activity was to consolidate the values underpinning the design and give the design process a direction.

Exploring affordances

During the break participants were shown a video with different types of digital technologies that could be used in creating 'phygital' interactions and games. They were then divided into three groups and given inspiration boards with examples of equipment for physical activities and digital

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technologies. They were invited to mark on the inspiration boards provided what affordances they could spot for the different types of resources that could be used on the trails. They were asked to think about uses and opportunities both intended and unintended.

Exploring the constraints

Participants were asked to use a tool specifically created for this task: the constraint hexagon. Participants were to fill each side of the hexagon with issues that have to be considered when creating the design of the walking trail. For example, one side of the hexagon were to be filled considering the people that would use or be affected by the trail. Another look at the geographical aspects of the trail.

Everyone as co-designers were able to explored the boundaries the design, reflecting on and identifying key elements to be included and excluded in their planning.

Ideation

Participants were given a map of the park and a prop of a mobile phone. Focusing on those two objects, they were asked to come up with as many ideas as they could in 5 minutes, writing them down in post it notes.

After that, participants were able to vote, each participant casting 3 votes with stickers to quickly identify which of all these ideas has the most potential for further development.

Rapid prototyping and body-storming

Participants were given rapid prototyping materials and props to create to create a fun and interactive walking trail. Each group was expect to come up with three to six ideas for physical activities or interaction that have been developed and tested against the constraints and aspirations. Groups were asked to demonstrate and articulate their ideas through role-playing/bodystorming. The demonstrations were video recorded.

Testing ideas & ranking

In this last activity participants voted on the ideas they liked best. Three ideas were identified as potential concept prototypes for the next stage of the project.

pictures on page 18:

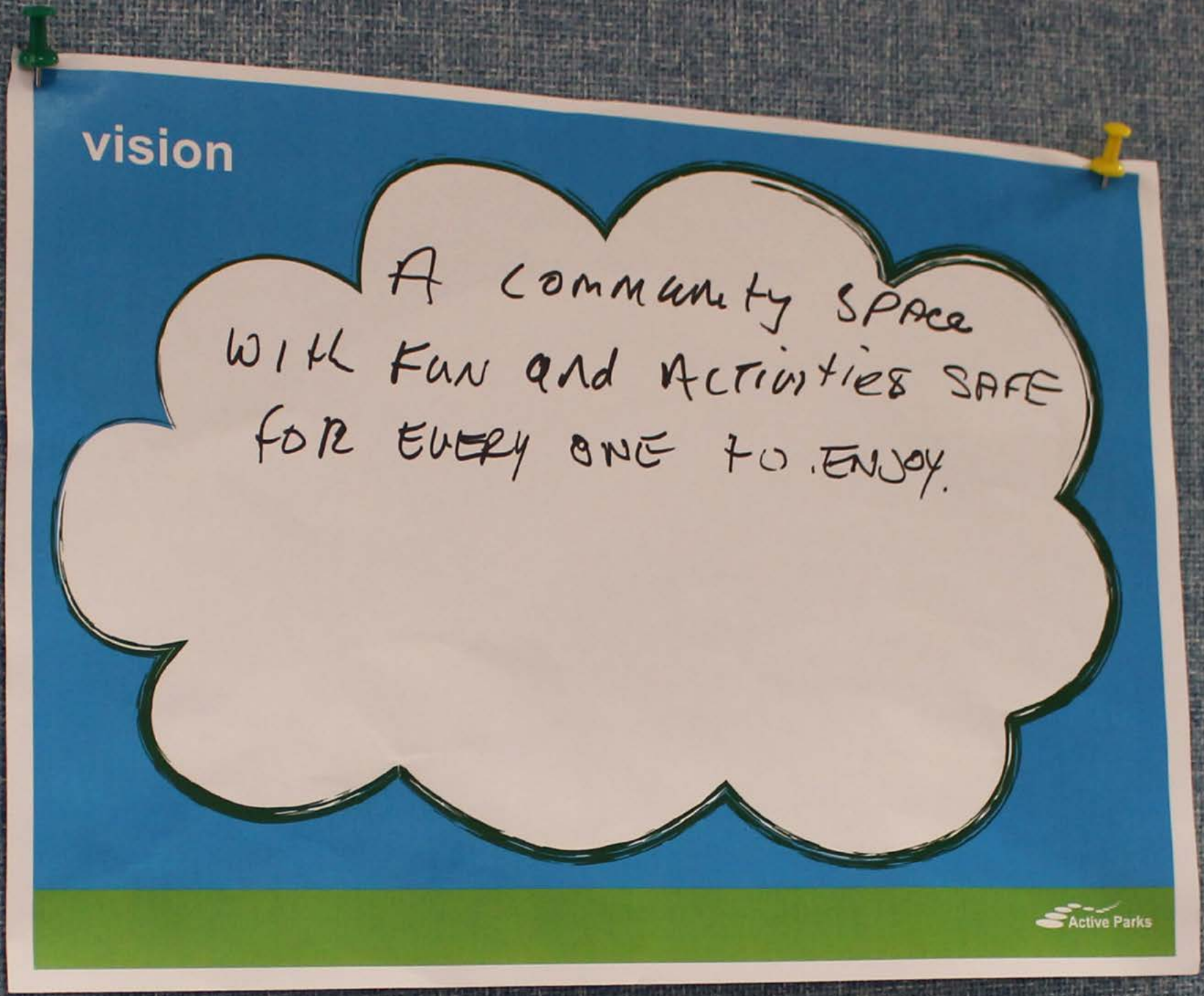
1. some of the materials used in the second workshop
2. group of co-designers working on “making sense of data” activity
3. group working on identifying a shared vision
4. rapid prototype of walking trail being created

highlights

the activities of the 2st co-design workshop helped to:

- **analyse all data gather in the previous events**
- **define a shared vision for the project**
- **identify constraints and affordances for the co-designed interactibe wlaking trail**
- **generated ideas for the interactive walking trail that were then used to create the design solution and proof-of-concept presented in this report**

picture on this page:
some of the findings from the second workshop


vision
A community space with fun and activities safe for every one to enjoy.
Active Parks

Findings

The co-design activities carried out identified key values for the project. Those issues highlighted the importance that the interactive trail co-designed followed those values and enabled the local community to engage in exercise in a playful manner, helping to bridge the generation gap, and that it was accessible to everyone. The data also showed that the park was seen as a place not only for doing exercise, but also as a meeting place for social activities. The walking trail was seen as a way to enable those social encounters and to further develop a sense of community. Participants identified that the walking trail could be something the community would be proud to showcase, building interest in the park and motivating the uptake of exercise.

However, there were also negative issues identified during the workshops regarding the current use of the park. Those issues were centred around a perception of lack of security for people using the parks, for example, risk for children because of traffic around the park, problems related to dogs such as fouling and dogs being walked unleashed. The participants also reported on a perception that vandalism could be a barrier for projects being implemented. There were also issues raised included the lack of facilities such as toilets and a café, That was seen as a deterrent for people taking up more physical activities in the park.

The design proposition presented in this report is the result of the co-design process carried out in this project. The data from the first workshop and the community event in the park was analysed by the co-designers during the 2nd workshop.

The data was grouped and themes emerged and finally synthetised into a shared vision: ***'A community space with fun and activities safe for everyone to enjoy.'*** This vision was the guiding force behind the ideas generated and the rapid prototypes created by the end of the second workshop. Each of the three groups came up with ideas for interactive physical activities to be conducted in Ryelands Park.

These ideas were then aggregated into one co-design proposition for an interactive and playful walking trail that will be explained next.

picture on page 21:
the shared vision statement

Co-designed concept

The ideas for this concept came from the co-design workshops conducted. It combines physical and digital interactions with objects built in the park (see bubbles below) to make visits to the park more fun and active. In addition, the co-designed concept proposes three ways people can have a more fun and active walk with the use of their mobile phones:

1. Constellations: (blue line) follow a predetermined path, reaching certain places and markers spread around the park, for example following the shape of a constellation.
2. You draw it: (red line) you walk around the park as you like and at the end of the walk, you can see visualisation of the path taken.
3. Chasing game: (yellow line) the game simulates a chase and you have to perform tasks, overcome physical obstacles and move fast to escape your virtual pursuers.

Augmented reality garden

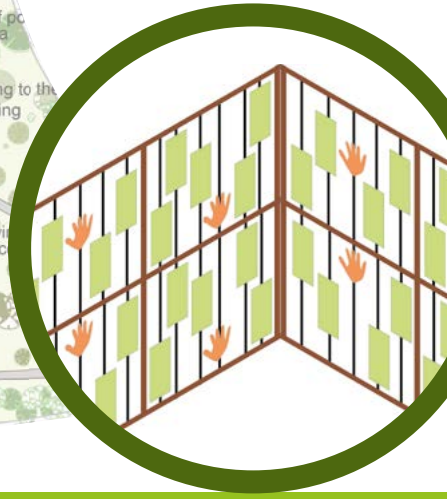
Using QR codes and mobile phones, people find out more information about the garden. For example, what flowers are planted there, see photos of the garden throughout the seasons or find out how to help with gardening.

Objects to help doing exercise

Modified park furniture, such as benches and steps, that can be used as exercise machines.

Phygital Xylophone

make music and exercise by tapping different sequences on this object using your hands or a mobile phone



Active Parks

Co-design proposition: A suggestion for an interactive and playful walking trail

The proposed health trail combines physical and digital interactions with objects built in the park to make visits to the park more fun and active. The ideas generated through the co-design workshops included a large ‘phygital’ xylophone style activity, where one exercises by moving around it to create music; a mobile phone generated zombie chase activity incorporating physical challenges in the park; a park discovery and exercise activity, where set challenges invite you to physically explore the park through interactive, enjoyable and playful stories. These ideas were incorporated in the design which has two main elements: fixed features and navigation. The map on page 23 illustrates how this could be deployed in Ryelands Park.

Fixed features

these are built structures with fixed positions in the park. Here are three suggestions of fixed features that could be implemented

Interactive ‘phygital’ xylophone

With this installation people can make music and exercise by tapping different sequences on this object using their hands or a mobile phone.

Exercise circuit with objects to help in doing exercise

For this feature, park furniture would be modified, for example, benches and steps, in order to be used as exercise machines.

Augmented reality garden

Using QR codes and mobile phones, people find out more information about the garden. For example, what flowers are planted there, see photos of the garden throughout the seasons or find out how to help with gardening. The objective is to motivate people to keep visiting the park.

Navigation

The co-designed concept proposes three ways people can have a more fun and active walk with the use of their mobile phones expressed as ideas for ways to navigate the park.

Constellations

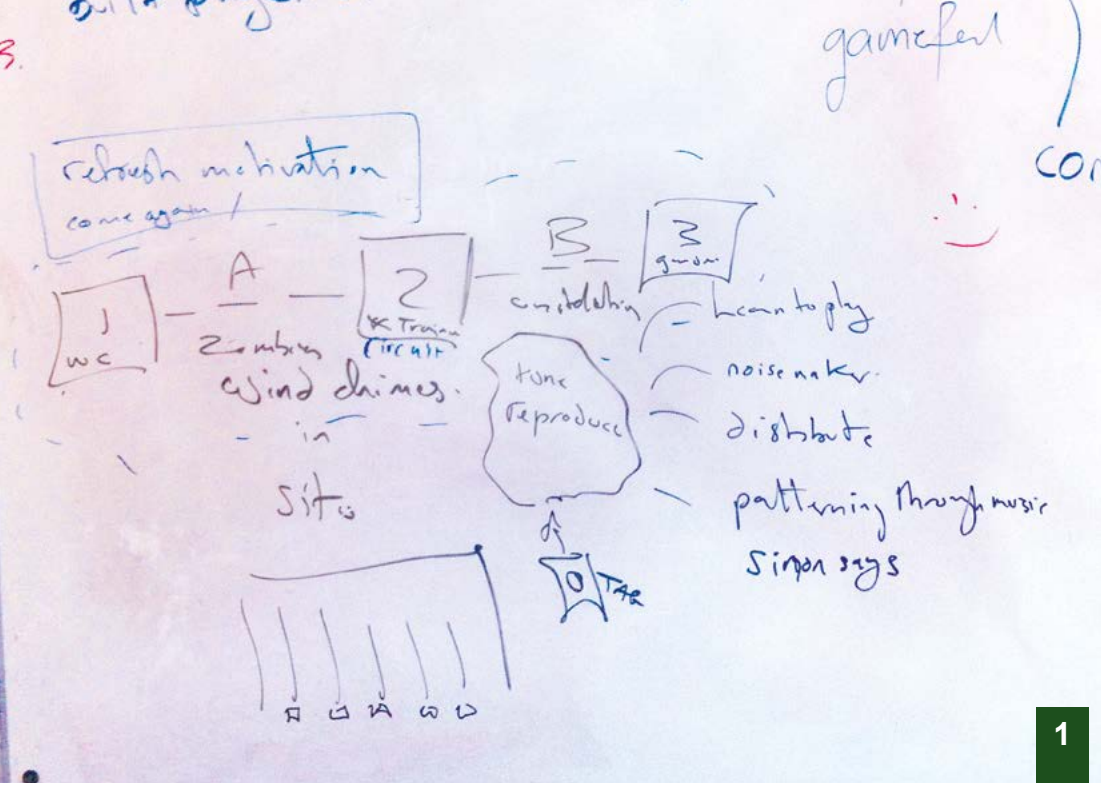
With this style of navigation, the users follow a predetermined path, reaching certain places and markers spread around the park, for example following the shape of a constellation. An app on their mobile phones would provide users with isntructions.

‘You draw it’

Users walk around the park as they like and at the end of the walk, They are able to visualisation of the path taken with the help of an app on their mobile phones.

Chasing game

In ths modality the navigation of the park is a game. The game simulates a chase and users have to perform tasks, overcome physical obstacles and move fast to escape virtual pursuers.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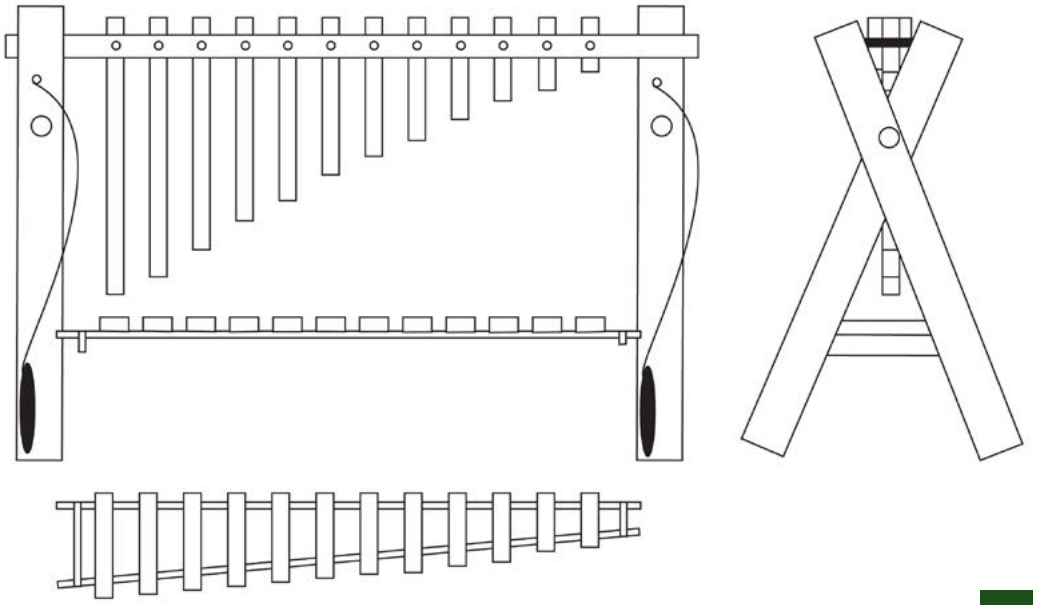

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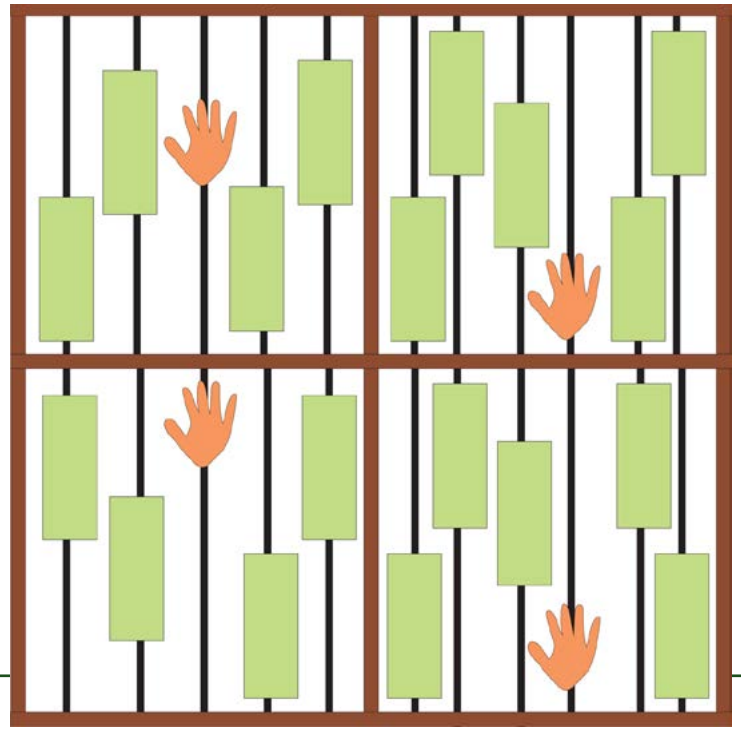

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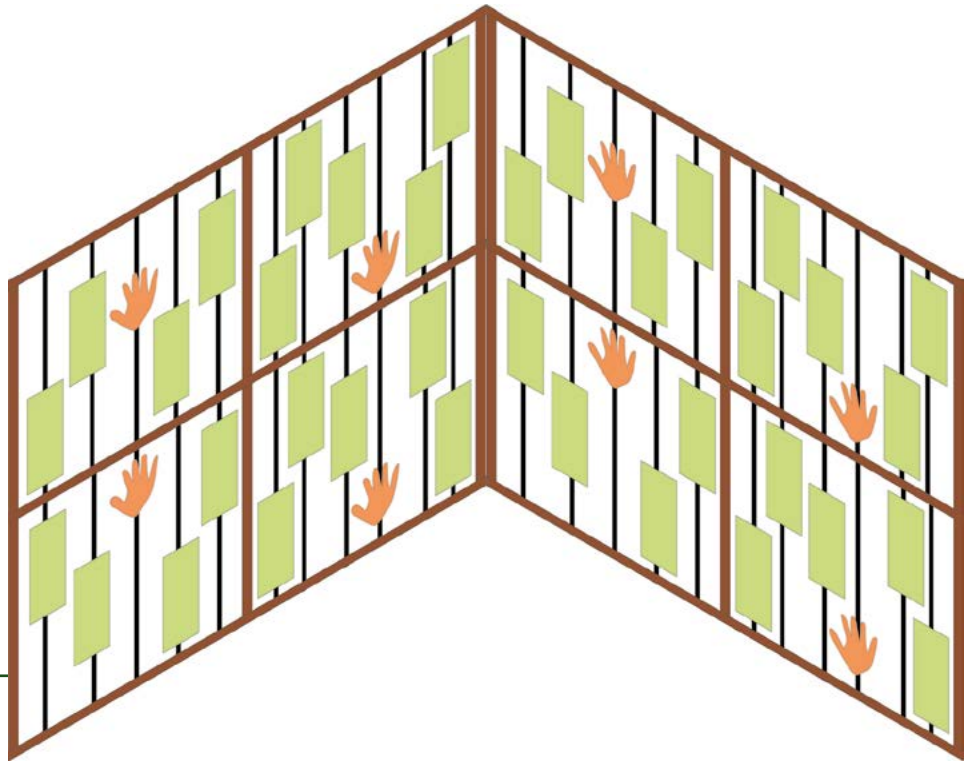

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Proof of concept: Phygital xylophone

It wasn't possible to develop a proof of concept prototype for the whole trail co-designed within the timescale and budget allocated for this project. Instead, the team chose to develop only the concept of the interactive wind chimes or xylophone, because it could address all the principles and values established in the workshops. The phygital xylophone has both physical and digital elements; it is a playful and fun interaction with the potential to incorporate games; it enables exercise that complement walks by requiring users to stretch and bend as they reach for notes; and it has also the potential to be a social activities because besides from individual play, users can also play in groups.

The team discussed and brainstormed ways to bring to life the concept of the wind chime/xylophone initiated in the 2nd workshop. The design passed through a few iterations, for example some models that had vertical and horizontal slats, while other just vertical. Also there were variations on how the elements were display, if on a straight line or in a curved semi circle. Ideas were discarded or developed depending on the practicalities of construction and regarding usability and safety. Another issue considered was accessibility. The initial idea was that users would need a NFC enabled smart phone, however the team felt that it would be ideal if the prototype could also provided a way for people with no digital device to interact with it. The alternative to the mobile interface is a touch-based interface were with conductive elements that closed the circuit and activated the sounds whenever a someone placed their hand on it.

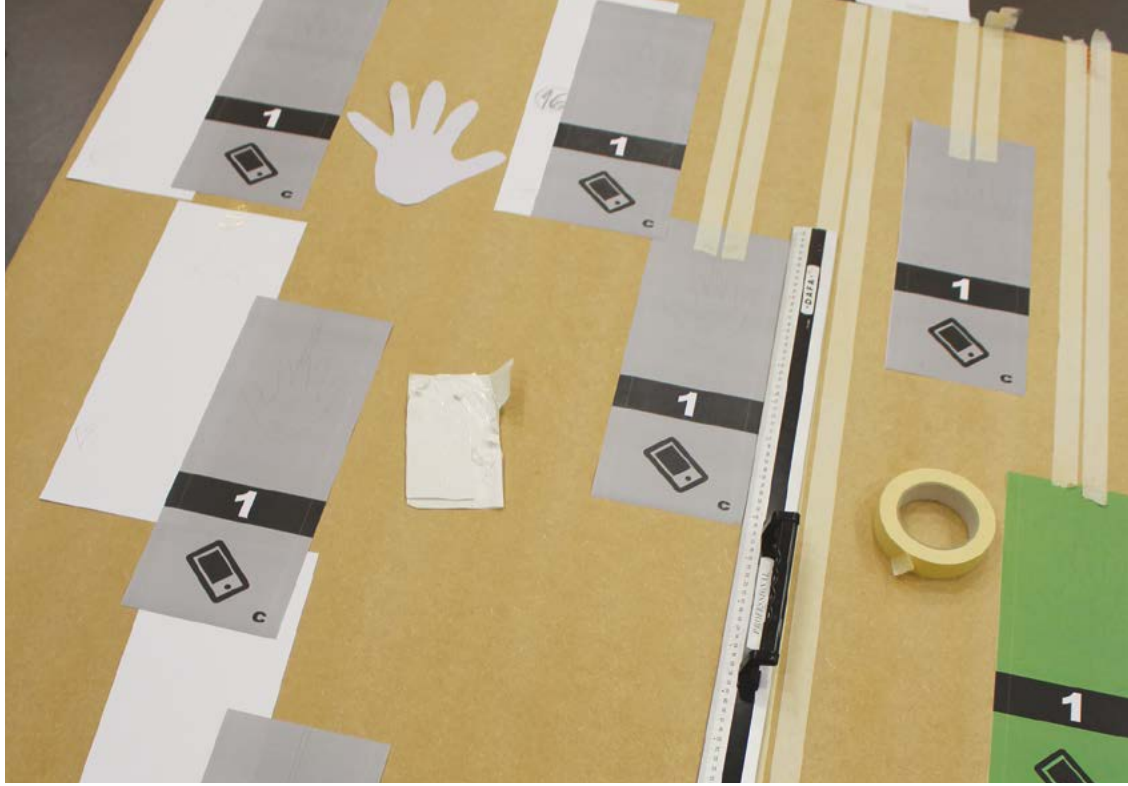
pictures on page 25:

1. synthetising the ideas from the workshops

2. early sketch of the interactive xylophone

3. and 4. initial design ideas for the interactive xylophone


BARE
CONDUCTIVE



First proof-of-concept prototype

The first prototype was constructed with a mobile NFC interface and a conductive touch interface based on a MaKeyMaKey microcontroller. The shape of the prototype was left as simple as possible in order to minimise the time spent in construction and maximise the time spent in developing usability and interactive aspects of the interface.

Two walls made of plywood and fixed together in a 90o angle, forming a corner, served as base for the interface. On the walls printed pieces of paper containing the graphic of a mobile and a hand, indicated where the users had to touch or tap with their mobiles. Conductive paint was used to paint the graphics of the hands and lines that linked the interface in the front of the prototype to the back where all the wires were connected to the digital devices.

This design was also practical in permitting the prototype to be built at the workshop at Lancaster University and transported in two separate boards to Ryelands part on the day of the event in which the prototype was being tested.

The touch interface allowed people to play the prototype like a music instrument. For the mobile interface, users could choose to play freestyle or to follow the mobile instructions that indicated which numbers to tap next. Using this function with the mobile phone, users could play the notes for “Twinkle, Twinkle Little Star”

Testing the first proof-of-concept prototype

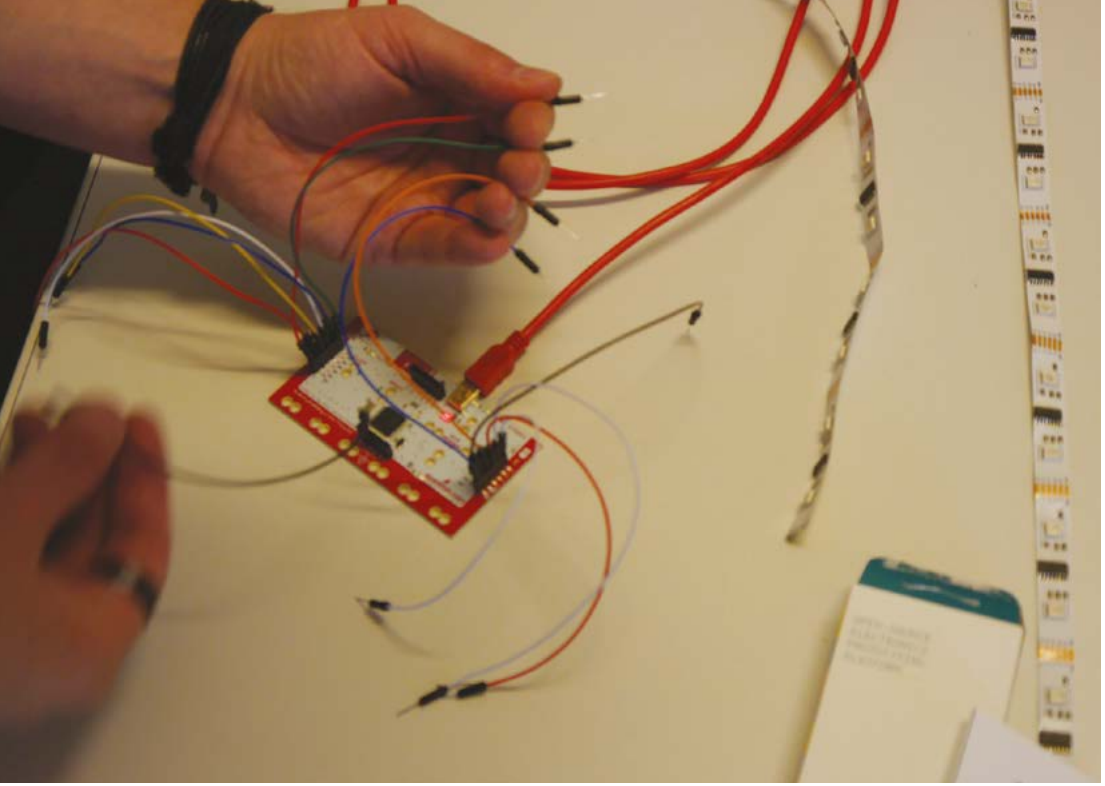
The test of the first proof-of-concept prototype took place at the This Side of the River 2014 event held in 28th of June 2014. We estimate that approximately 150 participants used the prototype on that day.

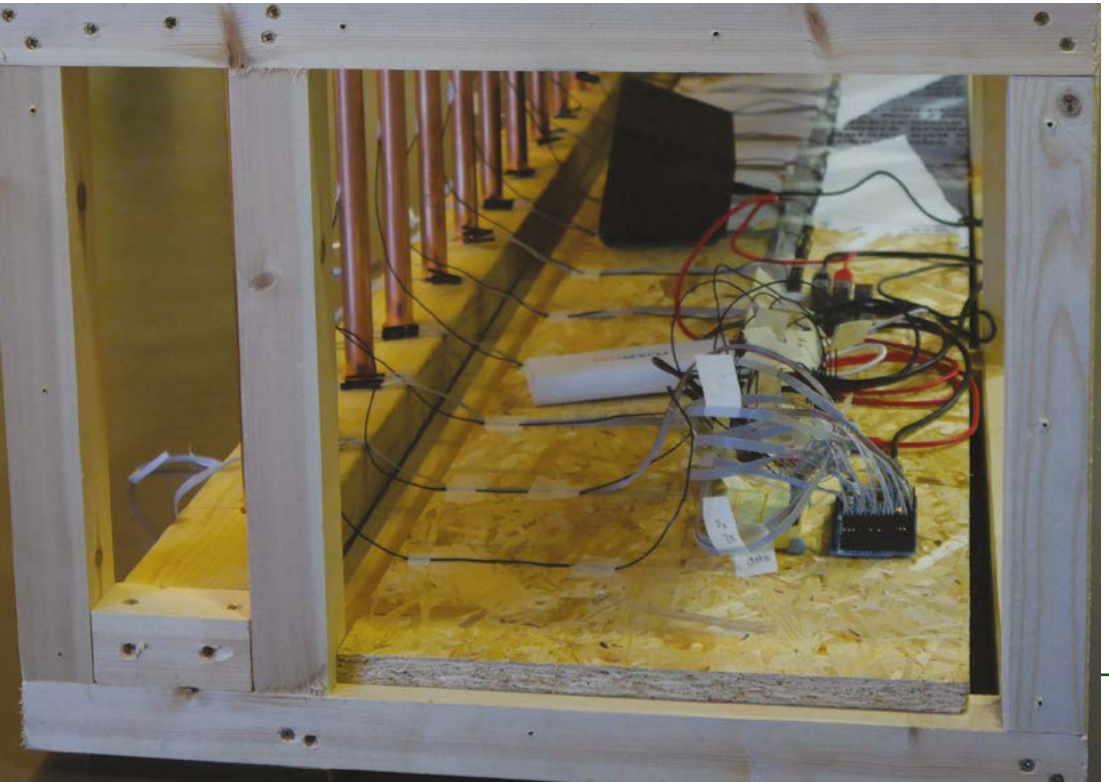
The prototype was assembled and all the digital elements were connected in the park. Members of the team were present to greet users and explain and demonstrate how to use the prototype. A few posters and leaflets provided background information about the project and two graffiti boards were used to collect the feedback from the users. One graffiti board asked the question ‘It could be better if…’ and a second invited the user to complete the phrase ‘The best thing about the xylophone is…’.

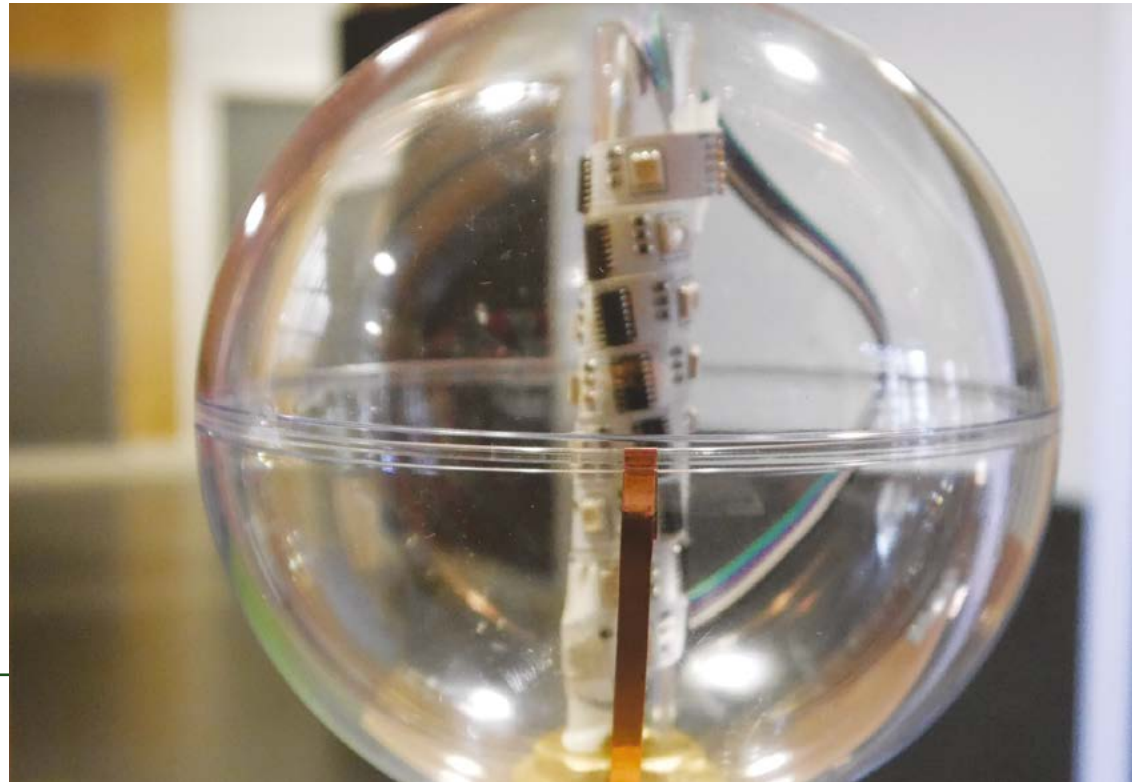
The feedback showed that the public enjoyed using the prototype. People across all age groups were interacting together, learning from each other and having fun. The artefact provides a focus for intergenerational bridging, which directly relates to the participants stated values. It also showed that the prototype had reached the aim of making people exercise in a playful way. The touch interface was more popular than the mobile interface. There were some issues with the mobile interface. It was sometimes slow to respond, and the NFC technology required the phone to be tap in specific positions.

pictures on page 27 and 29:
first prototype being built and tested

the picture above links to https://www.youtube.com/watch?v=HSQZ3mIlgr8 that shows a video of the 1st prototype being tested







Second proof-of-concept prototype

The second prototype was developed based on the feedback received from the testing of the first prototype. This time the NFC interface was dropped and only the conductive touch interface was used. The conductive paint proved not to be robust enough for the prototype and even after it was treated with fixatives the paint was rubbing of by the end of the testing. The team decided to use copper as an alternative conductive material.

The form of the prototype gained more attention this time and a free standing structure was designed and built incorporating a wooden frame as the base, 13 copper pipes for conductivity and to case the wires and 13 acrylic globes cover with some copper tape used as the touch elements. To the digital elements of the first prototype, LED lights were added and they provided visual feedback in addition to sound when users touched the interface. There were also laser etched instructions afixed on the top of the base of the prototype.

From what we learned from the first prototype, interactions was fun when people played together and when people had to exert themselfs by stretching and reaching for certain notes. The design aimed to enhance the possibilities of cooperation. For example, the palcement of the globes required that some users had to play together with other in order to reach some notes.

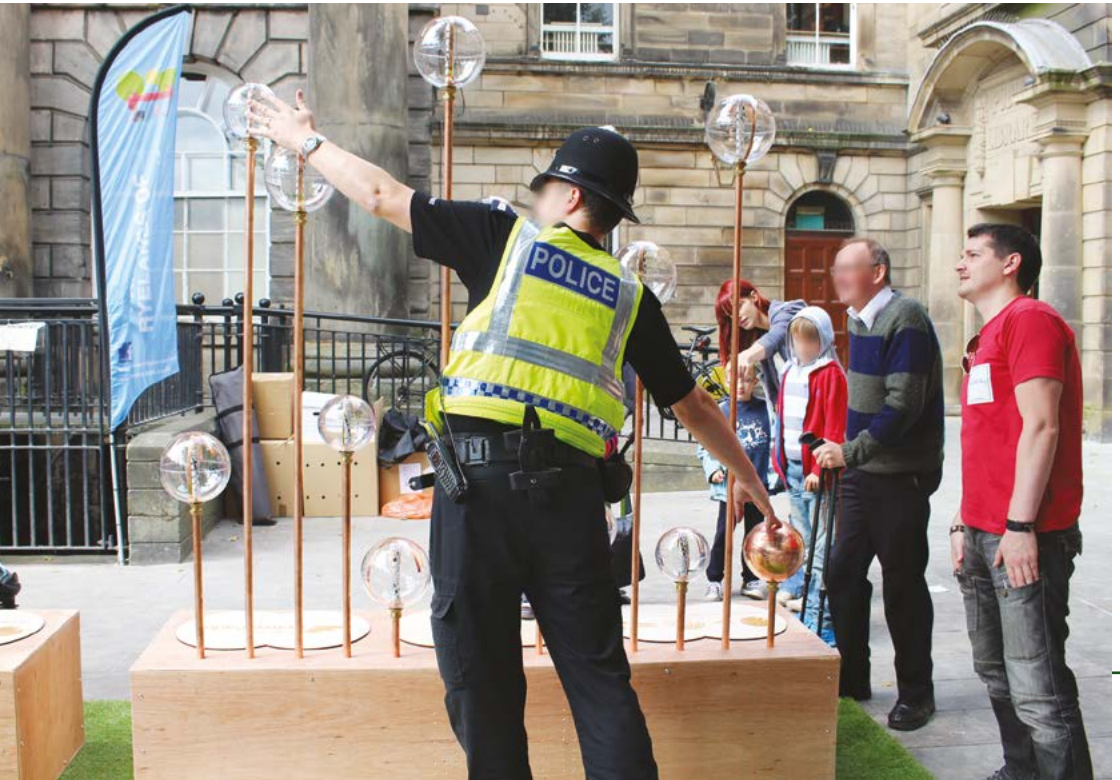
Testing the second proof-of-concept prototype

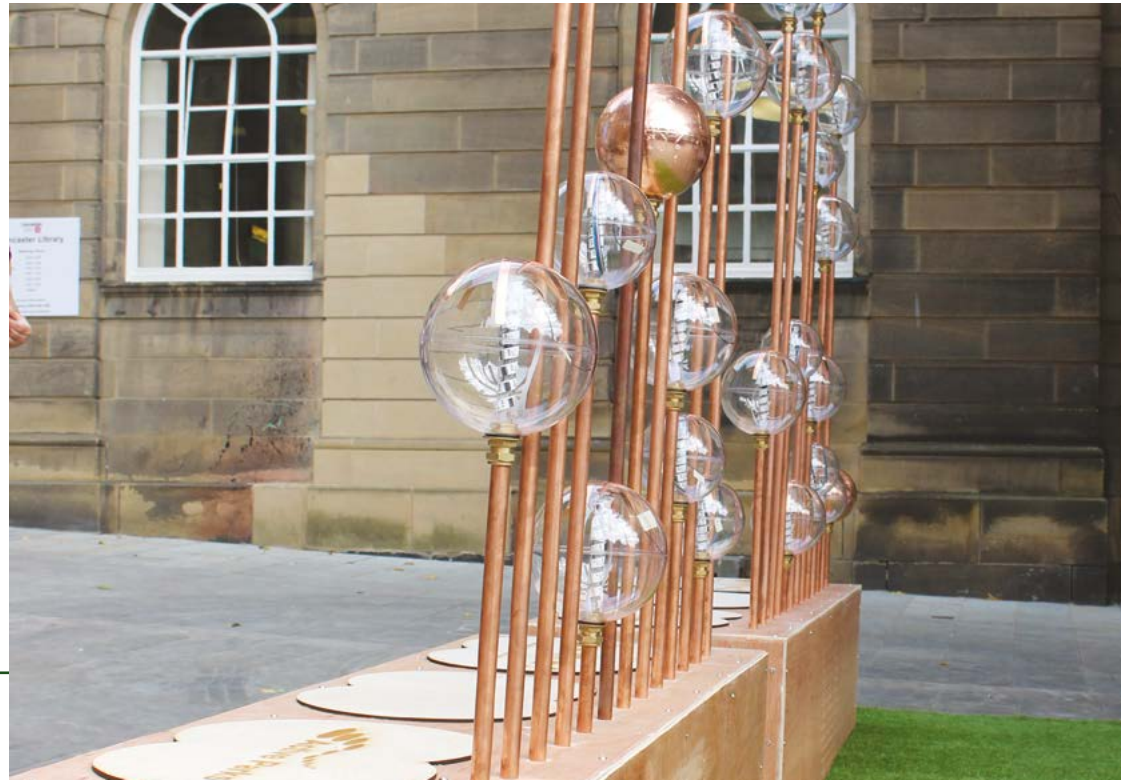
The test of the second proof-of-concept prototype took place at the Lancaster market square during Wednesday's market on the 20th of August 2014.

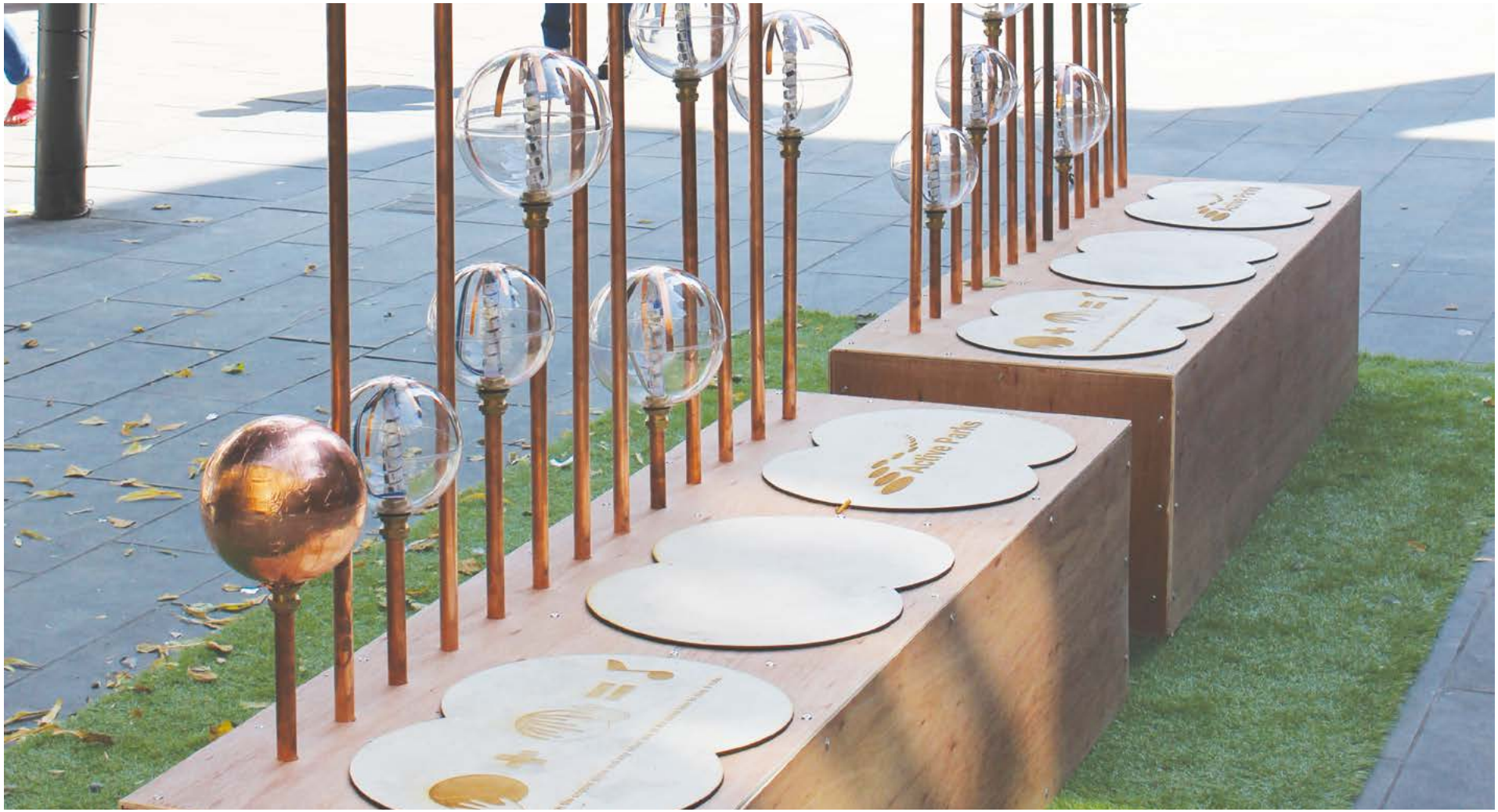
Members of the team were present to greet users and explain and demonstrate how to use the prototype. A few posters and leaflets provided background information about the project and two graffiti boards were used to collect the feedback from the users. Two graffiti boards were used to collect the feedback from the users. One graffiti wall asked the question 'It could be improved if…' and also invited the user to complete the phrase 'What I like most about the musical bench is…' A second graffiti wall asked the questions 'Can you see it in your park?' And 'Why?'

The feedback was once more very positive. Like the previous prototype, it also enabled people of all ages to play together. People welcomed the idea of having such an structure in their local park, however the materials need to be more robust for any permanent solution implemented.

pictures on page 31 and 33:
second prototype being built and tested


POLICE





the picture above links to https://www.youtube.com/watch?v=hG9y-Z5XGjI that shows a video of the 2nd prototype being tested

Conclusions and reccommendations

A number of co-design tools (generative tools) were designed and used for these workshops and these are available for future community projects.

The prototypes were developed as proof-of-concept only and were not built to last or to be used in all weather conditions. Modifications in the materials are a requirement for any designs installed in the park so that they are made of weather proof material, are safe, robust and that wi-fi access may be required to access the co-designed concepts, etc.

We were most encouraged by the public reaction to exercising in a playful manner while using the ‘interactive xylophone’. The interaction mode through the conductive technology received a lot more attention and was seen as a more natural way of inter- action. Although the mobile interaction mode allows for easier incorporation of games there are issues around accessibility. The most interesting element of the ‘interactive xylophone’ was that concepts such as this encourage grandparents and grandchildren to interact together, bridging in this way the generation gap.

We are currently in the process of redesigning it based on the feedback received, focusing more on playful aspects of the conductive mode of interaction. We are looking at concepts that gamify it further with a focus on the multiplayer interaction, in order to conduct more pilots with the public and collect more feedback on its playful and physical exertion aspects. We also plan to conduct a pilot with our NHS partner to investigate the health outcomes of such interventions for public health.

Future Work

The proof-of-concept prototypes were the initial steps in demonstrating how playful and interactive physical activity could be achieved. The team is keen to continue work with the partners in order to help the Lancaster City Council and community to realize their co-designed concepts. The next steps to be taken are to seek funding for a small pilot with our NHS partner to investigate the benefits of the prototype concepts in terms of public health in order to create evidence base and to help the City Council in securing funding to implement the concepts arisen from the co-deign.

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We thank all community members who took part in the various workshops and events organised by the Active Parks project, the Friends of Ryelands Park, Lancaster City Council, NHS Lancashire Public Health and our funders, the FASS-Enterprise Centre and the Catalyst research project at Lancaster University, funded by the EPSRC. We would also like to acknowledge the work of all the team who developed this project: Dr Emmanuel Tsekleves, Helen Ryan, Stephen Wearden, Marcia Tavares Smith, Adrian Gradinar, Andy Darby, Gabriela Suarez Trueba and Neko Chen.

interviews with members of the public about the project can be viewed at https://www.youtube.com/watch?v=TjgPElkMlFU

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