Exploring the impact of whole-school design projects
A case study of Fountaineers: designing an interactive, programmable water fountain
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Luckwell School is a state primary school located in Bedminster, South Bristol, UK and has seven classes (reception through to Year 6), with a total of 14 staff (teachers, learning support and administrative assistants) and approximately 200 pupils.

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**Digital Inclusion** – How the design and use of digital technologies can promote educational equality

**Teachers and Innovations** – Innovative practices and resources that enhance learning and teaching

**Learning Spaces** – Creating transformed physical and virtual environments

**Mobile Learning** – Learning on the move, with or without handheld technology

**Learner Voice** – Listening and acting upon the voices of learners

**Games and Learning** – Using games for learning, with or without gaming technology

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Tash Lee and Tim Rudd
Futurelab 2008
INTRODUCTION

welcome to

ickwell school
Introduction

Fountaineers is an ongoing partnership project between Futurelab, Stakeholder Design and Luckwell Primary School. The aim of the project is to use the design and construction of an interactive, programmable, ‘intelligent’ water fountain as a vehicle to explore issues around participation, learner voice and alternative approaches to teaching and learning, and to develop a powerful, flexible and unique learning resource that will become a valuable and integral part of everyday school life and learning.

The project was originally shaped around three key goals:

- **The design process** – to involve the whole school and explore new ways to communicate, combine ideas and make decisions, and to promote learner voice.

- **The fountain design and build** – to design and construct a water fountain with MIMO (Multi Input, Multi Output) characteristics which is reconfigurable in multiple ways and programmable by children.

- **Ownership by the school** – for students and staff to take ownership of the design process, and of the fountain itself, integrating it into their teaching and learning practices.

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1. An interactive and programmable ‘intelligent’ fountain has a series of inputs (sensors) and outputs (jets, lights and speakers) so it can be programmed to react to and interact with its environment and with people.
These goals were set against the backdrop of related policy debates, initiatives and trends in contemporary education including the Government’s personalisation agenda, the Every Child Matters framework, the Building Schools for the Future (BSF) and Primary Capital programmes and the QCA’s Curriculum ‘Big Picture’.

The project was also seen as continuing and ongoing, with the fountain acting as a catalyst for ongoing pedagogic research, rather than a finite project with a clear end point. This report documents the design process up to the point of construction and installation of the fountain (scheduled for early 2008) and the impact the project has had on teachers and pupils at the school so far. A further report will follow, documenting use, application and impacts of the fountain in the first six months of use following installation. Lessons learned from the project may inform institutions embarking upon whole-school or co-design projects, learning spaces redesigns (as part of forthcoming BSF or Primary Capital projects) or schools wishing to promote learner voice.

1. Executive summary

Overview

The entire school cohort was involved in the design of the fountain, acting as researchers, co-designers, advisors and engineers, working alongside external design and fountain experts. The design process enabled experimentation with different methods for making decisions and communicating across and beyond the school, and with different mechanisms for consultation and ways of working across age groups. The final agreed concept design was refined through a series of iterative stages, in consultation with the school.

Key findings

1. Shared goals, sense of cohesion

The project process offered significant opportunities for students and staff to work with different people across age and stage boundaries. This enabled greater communication, understanding and working between and across class groups and amongst staff, which, with everyone working together towards a common goal, contributed to a real sense of cohesion across the school.
2. Collaboration and creativity
Teachers have been consistently impressed by the work, commitment, ideas and abilities of children throughout the project. Students’ abilities to work in teams, to debate, compromise, collaborate and make negotiated decisions have continued to improve and surpass teacher expectations.

The creative and problem-solving aspects of the project have enabled certain individuals to demonstrate their abilities in ways that they have not previously been able to.

3. Teachers and curriculum innovation
All of the teachers have been inspired and enthused by the project, although some individuals have been more confident than others about the freedom to innovate in their teaching approach.

Finding sufficient time and space to dedicate to the project has been an ongoing challenge for the school, and attempting to bring about change alongside delivery of existing curricula requirements has meant that at times there was a feeling that two approaches were being delivered simultaneously. In addition, external pressures and perceived ‘requirements’ have sometimes taken precedence over the project.
4. A change in learning relationships
In the process of Fountaineering work there has been a less marked division between the roles of teachers and pupils in the classroom, with adults and children working collaboratively as a team, and there has been a significant amount of peer-to-peer teaching.

Working with external fountain designers and engineers was a very positive experience for both staff and students and effective for conveying information and reinforcing the ‘reality’ of the project.

5. Fountain as a design product
The project was envisaged as an attempt to push the boundaries of participatory design by exploring the extent to which children of a very young age could be involved in complex decision-making, and much has been learned.

The fountain as an end product was something that everyone was able to immediately identify with, although the complex nature of the design and construction made it difficult to convey some concepts and constraints easily to the young design partners. It was also challenging to create appropriate and practical hands-on activities, especially ones suited to younger pupils. Older students however, have shown themselves to be perfectly capable of making complex design decisions and weighing up alternatives.
There was significant enthusiasm for the project from the outset and throughout, although it took some time to create understanding amongst pupils that this was in fact a real design project rather than a theoretical exercise.

Although from the school’s perspective the process of designing and then commissioning the fountain took longer than expected, the vast majority of children did feel as though their ideas had been taken on board and incorporated in the final concept design. As such, the time spent on involving students has resulted in them having a significant sense of ownership over the project. This has not only been a positive experience for pupils, it has also had a broader impact on approaches to and organisation of learning and teaching in the school.

6. Communication and decision making
Various experiments with methods of communication, combining ideas and making decisions were tried out during the design process. Although there are still some obvious challenges around decision making when there are a great number of stakeholders, many of the tools and techniques introduced through Fountaineers have since been incorporated into the school’s everyday teaching practices.
2. RATIONALE
2. Rationale

Flexible skills for changing times

Many current educational debates relate to the need to develop an education system that will adequately prepare our young people for life and work in the 21st century. There is a call to personalise learning, to make learning more creative and to include and involve young people in decisions about their education. There is a need to create learners that are resilient, creative and flexible, who can collaborate, solve problems and think critically. These are the type of skills, it is argued, that young people will need to deal with [yet unknown] future challenges.


There are a range of initiatives seeking to bring about significant changes to our education system, curriculum design and pedagogy. These also encourage school leaders and teachers to innovate in order to provide a more meaningful, experiential and 'local' curriculum for learners – with learning that is more personal, holistic and learner-led.

Rethinking learning spaces

Initiatives and debates around the redesign of learning environments are also prevalent, largely driven by current government investment in school buildings. If teachers and learners are to contribute fully to these debates and have a real say in the redesign of their schools then it is important that there is the time, space and support for them to envision new educational futures and the pedagogies and approaches to teaching and learning that might underpin these visions. This includes considering how ‘non-classroom’ space might be used to support learning, the possibilities that new and emerging digital technologies may bring, or the organisation of time and people. It is also an opportunity to see how learners can be involved in the redesign process and how this itself might be viewed as a valuable and authentic learning experience with significant and real outcomes.

4. See, for example, Every Child Matters framework and Children’s Plan (www.everychildmatters.gov.uk); QCA Futures (www.qca.org.uk/qca_6073.aspx) and the Curriculum ‘Big Picture’ (www.qca.org.uk/qca_5856.aspx); National College for School Leaders (NCSL) (www.ncsl.org.uk); Excellence and Enjoyment – A strategy for primary schools (www.standards.dfes.gov.uk/primary/publications/literacy/63553); Planning, Preparation and Assessment time (PPA) (www.tda.gov.uk/remodelling/nationalagreement/ppa.aspx); Extended Schools (www.everychildmatters.gov.uk/_files/41989AB45948163B6B7CD07D0201C72.pdf).

7. For information see: Building Schools for the Future (www.bsf.gov.uk) and Primary Capital Programme (www.teachernet.gov.uk/management/resourcesfinanceandbuilding/Primary_Capital_Programme).
Fountaineering aims

The participatory nature of the design of the fountain was aimed at developing an understanding of design as a process as well as an end product, and with teachers and students working as equal design partners it gave opportunities for adults and children to do research, solve problems, develop ideas and make decisions as a team.

Taking into consideration the current educational climate and the opportunities to rethink what is needed and wanted from education and schools, Fountaineers afforded the following opportunities:

- **Learner voice** – to experiment with and develop new ways of consulting with children and strategies for supporting learner voice in practice.

- **Participation** – to explore and develop techniques for whole-school participation.

- **New locations for learning** – to explore the notion of alternative learning spaces, challenging the notion of the classroom as the main arena for learning.

- **New learning relationships** – as a whole-school design project it also offered opportunities to promote different learning relationships between teachers and pupils and also to support learning with peers (across ages), parents and siblings, the local community, and with external experts.

“THE FOUNTAIN PROJECT IS GOOD ’CAUSE WE GET TO GET OUT OF THE CLASSROOM, GET OUTSIDE AND WORK WITH PEOPLE THAT WE WOULDN’T NORMALLY GET TO WORK WITH”

Year 6 pupil
3. Story of the project

Futurelab’s and Stakeholder Design’s involvement in the Fountaineers project has covered three distinct areas:

- the facilitation, support and resourcing of the design process
- support for staff in exploring new approaches to teaching and learning
- researching the project’s impact on staff and pupils, on learning and on the ethos of the school.
A note about Luckwell School
Part of the decision to partner with Luckwell Primary School initially was that it is a forward thinking, creative school with which Futurelab had worked with before, and the head teacher was actively looking for a project to use as an impetus to experiment and innovate.

Although largely following the National Curriculum schemes of work, the school was already experimenting with timetabling, having termly TALK (Thinking and Learning Kinaesthetically) weeks and “mix-up” groups with children of different ages. Over the past few years the school has been implementing a BLP approach (Building Learning Power)\(^8\) across Key Stage 2. There is a big focus on pastoral care. There are no school uniforms and no bells. There is an active student council, an eco club and countless other extracurricular groups.

There are 14 staff (teachers, administrative and learning support assistants) and approximately 200 children ranging from reception to Year 6. During the course of the project there was a change in headteacher, which presented some changes in terms of the direction of the project.

“I HAVE NOTICED SUCH A DIFFERENCE OVER THE COURSE OF THE YEAR AND THE CHILDREN NOW THINK ABOUT AN ISSUE FROM LOADS OF DIFFERENT PERSPECTIVES”

Key Stage 2 teacher

These three aspects are described through the story of the project which includes:

- a visual chronology of the activities and milestones (pages 16-27: The fountain journey: a chronology)
- a walk-through of how we reached the final concept design (pages 28-33: Creating the concept design)
- an overview of our approach to research/data collection (page 34: Methodological approach)
- examples of how we worked with staff and sample activities (pages 35-38: Working with staff).

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\(^8\) See for example: www.buildinglearningpower.co.uk.
The project kicked off with a series of sessions to build relationships between the school and the external team. As part of Luckwell’s TALK® week there were two days of Fountaineering workshops, with the whole school working in 10 groups of 20 children of mixed ages [mix-up groups]. The aim of these two days was to enthuse everyone about working together to design a fountain and to start to get children and adults working together in new ways.

Tour of the school
In mixed-age groups [mix-up groups], children were tour guides for the adults, taking them around their school, explaining how they used the space around them. Using this tour as a stimulus, the students selected two locations and explained what they liked about each place but how they might improve or change it. These ideas and suggestions were then turned into a giant mural that covered the walls of the entire sports hall. Everyone reviewed what had been suggested, commented on each other’s ideas and voted for their favourite improvements.

9. TALK – Thinking and Learning Kinaesthetically. TALK weeks are run for one week once every six weeks and include visiting experts, non-class based work and a variety of activities. The intention is to inspire and excite children, to build a love of learning, and give vehicles for both practical activities and a greater depth of study. Luckwell introduced this approach in 2003.
MOBILE, COLLABORATIVE AND LOCATION-BASED LEARNING

2. DESIGN PROCESS

The month began with a workshop for teachers to share their visions, hopes and concerns for the project. Each week mix-up groups got together to brainstorm different ways to make decisions and to communicate and work out what things they needed to find out in order to be able to design a fountain. The idea of the fountain was incorporated into a variety of class work and subject and topic areas, including PE, poetry, dance, literacy etc. Some teachers set up mechanisms for pupils to come up with ideas and questions and log them as they arose.

A ‘Fountaineering wall’ was established in the main hall as a space to document the project, share ideas and make decisions.

Tour of the school

Voting for favourite ideas

The Fountaineering wall
3. STORY OF THE PROJECT

**Christmas fountains**

The concept of ‘act-react-interact’* was introduced to teachers, and children were encouraged to think of the fountain as a ‘living being’ that was able to ‘see, hear, feel and think’. If it could do these things what might it be able to do? Over the Christmas holiday students modelled and drew their visions for the fountain and how it might interact intelligently with people and the environment.

“They have obviously been doing things with their parents, because the models were quite elaborate and grand.” **Key Stage 1 teacher**

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There was a whole day of workshops, with all 10 mix-up groups exploring some of the questions they had collated around colour, spout shapes, and the ways the fountain could react and interact and so forth. It also allowed the introduction of new concepts and began to get the children thinking of the fountain in terms of its programmability.

There were also numerous discussions about the location of the fountain, with many ideas and different rationales, mainly based on where the most people would be able to enjoy it.

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**Act-react-interact**

- **Act** – the fountain is choreographed to do its own thing. There will be no reaction to its environment.
- **React** – the fountain will react to a particular input and behave the same way in response each time. For example, every time you clap the jets will spout water for 30 seconds.
- **Interact** – the fountain is able to choose a response from a series of options given to it by the children. The unpredictable nature of its responses lends personality to the fountain and leads to sustained engagement.

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**Decision making**

In their class groups children and teachers piloted different decision-making processes to see what worked best. These included: secret ballots, ‘run around’ (physically moving to a location to show your support for that option), coloured stickers, post-it note comments and ‘show of hands’.

They trialled all these processes to agree a logo for the project and found that although many of the methods ended up with the same result, some mechanisms were better than others for certain tasks. With the design it was better to be able to make comments in order to combine ideas, but sometimes a secret vote was best because it wasn’t subject to peer pressure.
Roboteers
The introduction of LEGO Mindstorms turned children into ‘Roboteers’. Following on from this there was a significant amount of peer teaching, with the Key Stage 2 ICT guides teaching the rest of their class how to use the software and instigating the ‘Tribot Challenge’ where groups were challenged to program a robot to circumnavigate a wastepaper basket three times and finish squarely on a piece of A4 paper.

More hands-on activities were introduced that were explicitly related to the project. These included ‘The Big Squirt’ and ‘Roboteers’. There was a significant amount of work on the ‘best location for the fountain’ consisting of class debates, online and face-to-face discussions with mix-up groups meeting once a week. A Fountaineers e-mail address was set up as a permanent external link, for pupils and staff to be able to ask questions as they arose.

The idea of a ‘mobile’ fountain was raised by the children with the thinking that this would enable easier access to the fountain for everyone and thus make it fairer.

The Big Squirt
The ‘Big Squirt’ gave children an opportunity to experience different ways of moving and making shapes with water. Very few of the children had any ideas about how water might be propelled. As the head teacher put it: “As teachers we’re forever trying to stop children propelling things – especially water”.

The school asked parents to bring in a variety of water-related artefacts such as water pistols, sprinklers, hoses, bottles and sieves. Over the course of a week children worked together in different groups to play, experiment with, and see how far they could propel water.
2. DESIGN PROCESS

In February there was a whole week off-timetable dedicated to the project – ‘Fountaineering TALK week’. The aims of the week were to make some concrete decisions, ultimately deciding a location for the fountain; to give children opportunities to express their visions for the interactivity of the fountain; and to get the pupils to physically build something that they tested, refined and rebuilt through a series of iterations.

There was also a lively and highly visual interactive fountain demonstration by one of the fountain experts, and an ‘expert help desk’ set up in school that was manned all day for children to ask questions as they arose.

3. STORY OF THE PROJECT

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A Day in the Life...

To start exploring how the fountain might be able to react to and interact with people and its environment, children worked in groups on a comic strip that showed ‘a day in the life of the fountain’. They then voted and commented on each other’s ideas. From this we were able to start extracting functional specification for the fountain – a list of inputs/outputs and features that had been specified through the children’s work to date.

Some questions posed to the help desk experts:

- Is it possible that the fountain could sense people’s feelings?
- Can your PS2 connect to the fountain and the score affect the water?
- Would you be able to make the water make the shapes of letters?
- Can it go on solar or wind power or even lunar power?
- How big can a mobile fountain be, how would you move it from the upper to the lower playground, can it go in the lift? Is it not too heavy?

Expert help desk

While children were working together to develop their comic strips, a panel of experts were on hand in the school hall to answer their questions as they arose.
DrawBot Day

DrawBots\textsuperscript{10} are upturned plastic cups standing on felt-tip pens and powered by a motor and two batteries. When you set them off they create wonderful and interesting patterns across any sheet of paper.

Children worked in small mixed age groups of four or five to design, build, test, refine and decorate their DrawBots, then set them all free on a giant piece of paper in the school hall. This activity was a chance for children to build, test and refine an object for themselves.

\textsuperscript{10} DrawBots were originated by Jonah Brucker-Cohen. For information, see: www.artbots.org/2004/participants/DrawBot.
Location evaluation
There was a thorough evaluation of all of the potential locations using De Bono’s Thinking Hats and also ‘splash diagrams’ with opinions being combined via a ‘rolling brainstorm’. Out of this, the top playground fared best. However, the children weren’t happy with the methods used to reach this result and at the end of the week there was a vote – a secret ballot where the outcome demonstrated a mobile fountain was the favourite option.

As the design considerations and build/budget implications of a mobile fountain were so starkly different from a fixed fountain, it became necessary to explore the pros and cons of each in more detail. There were lots of discussions in class and assembly about a small movable fountain versus a permanent structure built in the playground. These culminated in ‘Fountain Decisions Day’ where important choices had to be made. Having decided on a location and a wish-list of features, the ‘Fountaineers’ started their concept designs. These 200+ fountain designs were the start of the design for the physical fountain structure. See ‘Creating the concept design’ [p28] for more information.

Google SketchUp
Google SketchUp – a free piece of software for creating 3D models – was introduced to the school in early March. It was shown to the Year 5 ICT guides who picked it up quickly, immediately started using it for their fountain designs, shared it with their classmates and then asked to run an assembly for the whole of Key Stage 2 to share how to use the software.
“A GROUP OF FOUR ICT GUIDES ASKED YESTERDAY IF THEY COULD ORGANISE AN ASSEMBLY TO SHOW THE REST OF THE KEY STAGE 2 PUPILS HOW TO USE GOOGLE SKETCHUP. THEY DID IT TODAY, AND DID A BRILLIANT JOB – QUITE STUNNING HOW THEY PRESENTED IT TO A RAPT AUDIENCE OF 110 KIDS AGED 7-11 EVEN WHEN THEY WERE GETTING INTO VERY HARD TERRITORY”  
Head teacher, March 2007

**Fountain Decisions Day**

‘Fountain Decisions Day’ was devised to help staff and students make the choice between a mobile and a static fountain. One of the fountain experts ran interactive sessions to practically explore the effectiveness of lighting, the effect of different inputs, the differences in costs of various features, and the amount of splashing from jets, and considered these issues for both mobile (indoor) and fixed (outdoor) fountains. Each class worked on a set of questions sending out a couple of ‘ambassadors’ to ask questions on behalf of their classmates. Each class then voted for either a mobile or a fixed fountain and prioritised the types of inputs/sensors that they thought would be the most interesting.

“It was really interesting that the ambassadors, in my class at least, chose to feed back the most interesting and salient points, not just the answers to their own questions.” **Year 5 teacher**
With a decision made on the location and the key features, and a concept design for the fountain, Futurelab worked on a Request for Proposal to secure a company to build the fountain. The school started working on an operating system in preparation for the arrival of the fountain: Who was going to use it? What was it going to be used for? What was the plan for maintaining it? How was it to be incorporated into teaching and learning?

DrawBot art
Year 6 continued experimenting with the DrawBots, trying out different combinations of brushes, paint and felt-tips. Some of resulting artwork was exhibited in the Southbank Arts Trail, in Bristol.

Preparing for the fish
The school was given an empty fish tank as part of the preparation for the fountain’s arrival. The rationale was for staff and students to have something tangible around which they could make collective decisions, project manage, negotiate and maintain something real. Each class spent a considerable amount of time working together to figure out what they needed to know, learn, answer and consider, and the whole school worked together to establish roles and negotiate responsibilities before setting up the fish tank and buying the fish. This was a good medium for piloting a student led organisational structure for the fountain.
A potential supplier had been found and there were decisions to be made about the complexity/size of the structure and the amount of features that were feasible within the budget, which were explored with everyone at the school. Teachers worked with their classes to negotiate and agree areas of specialism that they were going to lead on for the rest of the year. These focus areas ranged from creating a time capsule to bury in the fountain, to seating, maintenance and programming. There were also a series of workshops with staff to help them to think about the fountain as a resource to support, and potentially to change, their teaching practice.

To explore the compromises that had to be made on the fountain design, the fountain expert ran a day of workshops around a life-size model of the fountain (built out of tables, chairs and bits of pipe). Working with the children he manipulated the mock-up – taking things away, changing the layout and asking staff and students what they thought. This exercise refocused the children on the project and raised lots more questions which were answered in a whole-school Q&A session.

Tables and chairs prototyping

To explore the compromises that had to be made on the fountain design, the fountain expert ran a day of workshops around a life-size model of the fountain (built out of tables, chairs and bits of pipe). Working with the children he manipulated the mock-up – taking things away, changing the layout and asking staff and students what they thought. This exercise refocused the children on the project and raised lots more questions which were answered in a whole-school Q&A session.
In sourcing the materials needed for the construction of the fountain, it was necessary to make some compromises on its structure, in order to retain its programmability and interactive capability. Two more concept designs were commissioned with the same inputs/outputs but a simpler structure, and all the staff and students were consulted to see if they were happy with either of the designs or whether they wanted to put the project on hold. Feedback was overwhelmingly in favour of Design 2. Sourcing the materials for building began.

Reflecting on the project

Each class took part in a reflection exercise to give the children an opportunity to share how they were feeling about the project, what ideas they had for using the fountain, what impact they thought it would have on school life and what they were most looking forward to.

What are you looking forward to?

Building it. Getting wet.
Interacting with it. Decorating it.
Playing with it. Showing it off.
Controlling it. Talking to it.
Looking at it. Eating on it.
Dancing with it. Talking about it.
Watching progress!
Blogs about the fountain.
Enjoying it. Paddling in it.
Having fun.

Group LRRH, Year 4
The school kick-started the project again with a second fountaineering TALK week (off-curriculum) – planned entirely by the staff with inputs from external experts. There were small group workshops with Key Stage 2 pupils to develop their LEGO Mindstorms skills. The youngest children worked on designing and filling a time capsule to bury with the fountain; Year 5s practised opening ceremonies for the fountain, and some classes took part in maintenance training. The specification of the fountain was finalised and all of the component parts were procured. Construction of the fountain began in the workshop.

Main fountain structure in the workshop

Creating the concept design

The aim was to create a shortlist of preferred visual and functional design concepts that all the Fountaineers had contributed to. From this we would draw key elements to feed into a series of professional concept designs.

**Step 1**
**Reducing 200 individual designs to 21 combined designs**

In each class children designed their ideal fountain as individuals or in small groups. Following this, there was a period in which the children commented on each other’s designs, designs were refined and combined and then there was a vote. Three designs from each class were put forward to the next stage.
3. STORY OF THE PROJECT

EXPLORING THE IMPACT OF WHOLE-SCHOOL DESIGN PROJECTS
Step 2
Further decision making to choose five designs

Along with the ideas exemplified in the shortlist of children’s designs, we took on board staff and student feedback throughout the process to date, and the main recurring important issues (e.g., a big spout (up into the air), recycling of the water, colourful, fun, vandal proof etc). Coupling this information with the chosen location and other budgetary and technical considerations, the visualiser/product designer created a series of five design sketches.
Step 3
Choosing the final two designs

Working in small groups, each class evaluated the five designs, adding their comments and feedback and placing these on post-it notes. Each class then negotiated a favoured design for their class – subject to a number of provisos.

There were two favoured designs from this stage. We took these designs, factored in all of the feedback as much as was feasible, and produced two concept designs to reflect the Fountaineers’ ideas and requirements.

“THIS IS THE MOST ENGAGED I’VE SEEN THEM THROUGH THE WHOLE PROJECT SO FAR – THEY’VE AMAZED ME, THEY’RE HAVING SUCH REASONED DEBATE”

Year 4 teacher
Step 4
Choosing the final design

All the Fountaineers reviewed the two new designs and fed back their comments. They decided to have an individual vote to choose the preferred design. Although the youngest year groups had overwhelmingly preferred the rainbow design, the overall winner with 70% of the votes was Design 2, 'The Amphitheatre'. Later on this design had to be further refined/simplified and the final concept design was agreed upon. The fountain was commissioned and construction began.
Methodological approach

The aims of the research were to document the evolving design process and assess the impact of the intervention on teachers, children and the ethos of the school. Whilst Sean McDougall from Stakeholder Design led on facilitating whole-school participatory activities, Futurelab staff took the perspective of participant observers\(^\text{11}\) on the project, feeding in to design activities and also documenting, collecting and analysing data. A range of data collection techniques were employed, including quantitative data from polls, votes and key decision points in the process, and a significant array of qualitative data was collected from observation of various activities, interviews with staff, pupils and parents, focus groups and teacher and pupil logs. Further evidence was drawn from children’s designs, design ideas, comments and feedback from which recurring themes, values and ideas have emerged. Teachers and students also acted as action researchers, documenting the project in weekly logs, through regular conversations and periodic whole-class, small group or individual review/reflection exercises.

Partly influenced by the Fountaineering experience, the school has planned medium-term changes to curriculum and approaches to learning, including an overhaul of the school’s curriculum with a move to a more enquiry/exploratory-based and child-led approach to all learning. Some of the tools and techniques introduced to the school are due to be incorporated into a ‘Luckwell Toolkit’ which will be embedded across the school.

DESIGNING A FOUNTAIN WAS A FIRST FOR ALL OF THE PROJECT PARTNERS AND WAS VERY MUCH A ‘LEARNING JOURNEY’

Working with staff

The whole process of designing a fountain was a first for all of the project partners and was very much a ‘learning journey’ that all the stakeholders embarked on together. There were two aspects to the intervention with staff. The first was the practical design of the fountain, which involved facilitating and suggesting activities, software, providing expertise (fountain, concept designers etc) and setting loose milestones.

The second was working with teachers to develop new teaching and learning activities that built on both the engagement and excitement in the project and the tangibility and versatility of the fountain itself as a learning resource and a lever for innovation. This work aimed to build a sense of ownership amongst staff and to help them to plan for using the fountain as a context for, and eventually as a resource to incorporate in, their teaching and learning practice. Teachers were involved in a series of activities to help them to generally feel more comfortable and confident about ‘letting go’ and exploring alongside their pupils, and to help them more specifically to devise new learning activities, envisage different pedagogies, locations and structures for learning and to embed the fountain into everyday school life.

In addition there have been regular internally and externally-led sessions to get teachers to reflect on their practice. Staff meetings and planning and preparation (PPA) time have both been used to share ideas, progress and plans amongst teachers.
In order to prepare staff for the unpredictable nature of the project, they were encouraged to think about it as a journey. They were asked to think about whether it was analogous to the following:

**A trip to the Moon**- ‘Is this a one-off mega project? We’ll need to have everything we need with us.’

**A five-year mission to explore strange new galaxies and civilisations**- ‘Are we truly heading into the unknown? What can we take with us and what can we use along the way?’

**The first trip to the North Pole**- ‘Can we learn from others who have tried? Can we practise before we go? We can’t take everything with us so we’ll have to improvise and recover from setbacks.’

Another tool introduced to help teachers reflect on their experiences of the project was a model developed by IDEO\(^\text{12}\) to help people to understand what techniques to use in different situations.

- **Painting by numbers**- ‘I’ve done this before, simply follow the instructions.’
- **Making a movie**- ‘Let’s write the script. How does it pan out? Who is the producer, director, stuntman?’
- **The quest**- ‘We know what we’re looking for, but we don’t know where it is. We’ll need to fan out and explore.’
- **The fog**- ‘Goals unclear, we’re completely lost. We need to figure out how to get out of here.’

Staff explored feelings and concerns in relation to the project and the idea that a project can go through different categories as it progresses. The model can also be used to reflect on different personality types and how individuals might approach/react to the project.
Piloting new techniques

As part of preparations for an entire week of Fountaineering, teachers were introduced to a series of techniques for thinking, evaluating and generating new ideas. One of these techniques was Edward de Bono’s Thinking Hats. Teachers learnt how to use this approach by using it to evaluate and refine their plans for the week ahead.

They then went on to use the thinking hats with students in evaluating different locations for the fountain.

What kind of learners?

Teachers brainstormed what sorts of skills they wanted children to develop, and then how the fountain project might be able to contribute towards this.

What kind of children do we want Luckwell to develop?

Self-aware, resilient, gifted, safe, conscious of wider world, creative, strong-minded, respectful, self-confident, caring.
3. STORY OF THE PROJECT

Sharing focus areas

Teachers had each negotiated with their class an area of interest surrounding the fountain that each year group was going to lead on.

These included seating, maintenance, protection from vandalism, and programming. Staff took these areas and then working in pairs brainstormed and shared ideas for activities to explore these themes.

Devising a ‘Fountaineering Curriculum’

A series of activities to develop a curriculum with the fountain as a starting point. Teachers firstly listed all of the tasks that needed to be done in terms of designing, building and then maintaining the fountain, then discussed topics with fairly obvious links such as history of fountains, water, and programming and continued to map out activities that used the fountain as a starting point. All of these were then categorised, organised and cross-referenced to the National Curriculum and were incorporated into teachers’ plans for future lessons.
4. THE IMPACT OF FOUNTAINEERING
4. The impact of fountaineering

Capturing imaginations, impacting curricula

There have been points during the project where teachers have been really excited and enthused about the project, and the idea of an interactive fountain has captured the imagination of every adult at the school. Staff have brought the fountain into their class teaching and devised their own methods of incorporating children’s ideas and giving them space to contribute and have their say.

Teachers have enjoyed working with children who are not in their regular classes and welcomed the opportunity to plan together, to share ideas and to work towards a shared vision. In spite of some of the challenges, Fountaineers has been a valuable experience for the staff and they have continued to take more and more ownership as well as maintain the momentum of the project. Over the course of the project all of the members of staff have grown in confidence in trying out different approaches, in handing over more responsibility for learning to students, and are increasingly more comfortable about being ‘in the fog’ in their teaching practice.
Partly influenced by the Fountaineering experience, the school has planned medium-term changes to curriculum and approaches to learning, including an overhaul of the school’s humanities curriculum with a move to a more enquiry/exploratory-based approach to learning. Some of the tools and techniques introduced to the school are due to be incorporated into a ‘Luckwell Toolkit’ which will be embedded across the school.
Challenges in freedom, time and space

Finding sufficient time and space to dedicate to the project, however, has been an ongoing challenge for the school. This is a common issue in many schools, juggling the demands of the curriculum, national tests, various educational initiatives and parental/societal expectations. The challenge of bringing about change and innovating alongside the delivery of existing curricula and assessment requirements has meant that at times there was a feeling that two approaches were being delivered simultaneously, sometimes contributing to a feeling that the fountain project was an additional pressure.

There were certain points throughout the project where the leadership team gave teachers freedom to openly explore the fountain project instead of delivering their planned lessons and standard literacy and numeracy hours – to enable them to try things out with their classes without having a predefined end point. Some individuals have been more confident than others about the freedom to innovate in their teaching. This idea of ‘going with the flow’ was difficult and challenging for some teachers who felt they were without the tried and tested tools and techniques of their teaching experience.

“Some of the ideas the children have come up with have completely knocked me out – really awakened in me what I love about my job as a teacher”

Year 5 teacher
An alternative pedagogy based on exploration and enquiry by students generally requires a change in focus, but it does not mean that all planning is forfeited. Instead, planning is predictive but not prescriptive. This change in focus is not something that can be changed easily; it requires planning time, support, scaffolding and space to experiment without the concern that time is being wasted. However there is often an ingrained belief that teachers have to be leading learning all of the time and that ‘teaching’ must result in ‘effective’ learning by students as measured by pre-defined measures and tests.\(^\text{13}\) Whilst teachers were not explicitly focused on ‘results criteria’ and external pressures such as Ofsted inspections, visits by the School Improvement Officer (SIO) and SATs results (despite the go-ahead to experiment), still had a mediating effect on the ability of teachers to try new approaches.

Another challenge was that in making the change from leading learning to facilitating it, sometimes teachers were so conscious not to direct children via more traditional methods of teaching that they didn’t feed in their opinions or knowledge in the way that they normally would, effectively forfeiting their roles as ‘equal design partners’ in the fountain design process.

Participatory design

An exciting artefact – everyone loves a fountain!
From the very outset of the project the idea of having an intelligent fountain in their own school captured the imagination of everyone involved and there have been high levels of enthusiasm for the project throughout. Building a fountain as a design project appeared a good choice as it was something familiar to everyone – even the youngest children had their own experiences of fountains and of water to bring to the project. There was evidence of children talking about the project at home and parents and grandparents getting involved – either by giving their children photos of fountains to bring into school or by helping them with their fountain designs, stories and model-making at home.

However, to design a feasible and functional interactive and programmable fountain is a significant and complex feat of engineering, which placed limits on the extent to which teachers and children were able to explore alone without support. Moreover, it was a unique project without a blueprint and the complex nature of the design and construction made some concepts and constraints difficult to convey to the youngest design partners.

“THE BEST WAY I CAN THINK OF DESCRIBING IT IS LIKE REBUILDING A PLANE IN MID-AIR, BECAUSE WE’VE STILL GOT TO BE FLYING WHILE WE ARE BUILDING THE THING…”

Head teacher
As it was easier to conceptualise, much of the school’s design input focused on the physical aspects of the fountain and less so on the programmable, configurable and interactive elements. These issues also presented a challenge in creating appropriate and practical hands-on prototyping activities. Whilst the fountain’s complexity as a design product may have hindered the school’s ability to take full ownership of the project and the design process, there is no doubt that there is a real sense of excitement and pride around the fountain that may not have been so strong if the project had been to design something more mundane.

Whilst a team of engineers, programmers and participatory design specialists supported the pupils and staff, there were some issues around maintaining open and effective communications about the concepts and the way they might be integrated in learning and teaching practices. This is an ongoing learning curve for all pupils and staff and is an area for continuing support following installation.
BUILDING A FOUNTAIN APPEARED A GOOD CHOICE AS IT WAS SOMETHING FAMILIAR TO EVERYONE – EVEN THE YOUNGEST CHILDREN HAD THEIR OWN EXPERIENCES OF FOUNTAINS AND OF WATER TObring to the project

Real-life fountain, real-life experts, real-life learning
Despite the children’s ongoing enthusiasm for the fountain there was somewhat of a lag in their conception that this was a real design project and that their ideas and designs were actually going to translate into a physical and permanent artefact. A diverse number of different learning activities helped pupils understand that the fountain would become a reality.

The opportunity to work with a range of external experts – from engineers, to product designers and technology experts – was a very positive experience for both staff and students. It proved effective for conveying information and communicating the realities and constraints of the project into children’s thinking and decision processes. External expertise and input also worked to reinforce the ‘reality’ of the project and re-energised school activities.

Organising, communicating and decision making with a team of over 200 fountain designers
From the outset numerous possible ways of involving the pupils were explored. These included:

- one year group to act as ‘key Fountaineers’
- a lunchtime or after-school ‘fountain club’ that might include parents
- a nominated ‘fountain steering group’ with representatives from each year group.
However, the staff were keen that this would be a whole-school project and at the conceptual stage, at least, everyone was to be involved to the same degree.

One of the issues of involving the whole school in the whole design process was the age-appropriateness of activities and the abstract nature of much of the decision making. In the early stages of the project much of the Fountaineering work was done in mixed age groups and was mainly discussion-based. However, these were often time consuming and younger pupils tended to get distracted at times. More generally, there was a sense of impatience with the relatively slow pace of a whole-school approach to decision making. Nonetheless, it was felt necessary that everyone developed a sense of ownership, and with the design process being iterative and new that it was worth persevering with such participatory approaches.

Throughout the project the school has experimented with various methods of communicating, combining ideas and making decisions (see p61 for info). Some of these worked better than others, and through hard work and a degree of trial and error the school has worked out which techniques work best for different purposes. Many of these tools and techniques have since been incorporated into the school’s policy and everyday teaching practices.
With such a large group of stakeholders, a number of challenges arise in the process of decision making and sharing information within the constraints of a school setting:

- time pressures often necessitate quick decisions which can mean that the whole team are not always consulted when they should be
- it is quite difficult to keep track of over 200 people’s ideas, combine these and mediate compromises between sub-groups or classes
- over longer periods of time it is possible to forget why certain decisions were made
- when it was not possible to reach a negotiated agreement, a decision was made on the basis of an individual vote – in these cases, it is necessary to be aware that some groups may be under-represented
- as it was a exploratory design project some constraints and implications for the design were not known from the outset, which meant that many issues had to be revisited to find ‘another answer’
- children always had more questions to ask than there was time to explore fully.

“I THINK IT’S GOOD THAT WE ARE MIXED UP IN DIFFERENT GROUPS INSTEAD OF JUST BEING IN OUR OWN CLASSES, YOU LEARN HOW TO CHAT TO THE YOUNGER ONES”

Year 4 pupil
4. THE IMPACT OF FOUNTAINEERING
4. THE IMPACT OF FOUNTAINEERING

“THEY DON’T JUST ACCEPT THINGS – THEY LOOK TO SEE WHAT IMPACT THEIR DECISIONS WILL HAVE”

Deputy head teacher

Learner voice – listening to children’s ideas

Teachers see the design process as being equally about education and decision making, and there was a desire to ensure good outcomes for every single participant. This brings significant challenges due to the numbers and age range involved. Despite these challenges a sense of ownership has been established amongst pupils, with them demonstrating their pride about the fountain and the hard work they have put in.

Twenty-one designs were chosen by the pupils from over 200 original and individual fountain ideas they had created. Following further discussion and input, children decided on a final design they felt represented their views and collective decisions. During this process the children have learnt that co-design means compromising their initial ideas and understanding the processes and techniques through which they reach collective agreement.
Creativity, learning and school ethos

Whilst not without challenges, this whole-school project has had an incredibly positive effect on cohesion in the school. The project has given teachers an opportunity to work together more, and to share ideas and stories as well as devise and plan activities as a group. All staff and students have got to know each other better through working and making decisions in mix-up groups, and children of different ages have had opportunities to work together. In this way, the fountain has acted as a kind of ‘cultural glue’ with everyone working towards a common goal and having something that they all share, and have a stake in.

Shared goals and ‘real’ work present opportunities for creativity and collaboration

There has been a considerable sense of pride and ownership over the fountain, with children reporting that they feel very pleased to be involved and proud that “our school will be the only one with a fountain in the whole of Bristol”. More interestingly children often stated how they did not expect to learn so much from each other. The older children (Years 5 and 6) commented regularly how surprised they were by the youngest children’s creative ideas and input.
Whilst skills such as creativity, problem solving, team work, collaboration, resilience, flexibility and so forth are difficult to assess, throughout the project teachers and children alike reported that these were being developed and demonstrated. There has also been an increase in confidence and maturity amongst the children as the project has evolved, and pupils’ ability to make collective decisions, debate issues, develop convincing arguments and to listen to and incorporate the ideas of others have continued to improve. Whilst many of the discussions and decision-making processes have been led by teachers, there have been a series of key episodes throughout the project where the knowledge and skills-building has been entirely driven by children, with much peer-to-peer learning also taking place.

We’ve seen evidence of children encouraging others to have their say and genuinely and democratically reaching decisions through listening, discussion and compromise. In some cases teachers have seen the impact of the project on the children and the learning culture in their classes.

At the beginning of the project the concept of learning around the fountain was introduced separately from ‘normal lessons’. However, over time work has continued to try and embed it within lessons, subjects and broader competency development in all classes. Furthermore, children started to ask questions about the fountain and brought in work they’d done outside school, whilst on other occasions teachers would opportunistically use the fountain as a topic in a standard lesson.

"WE’RE NOT SO ARROGANT ANYMORE. WE LISTEN TO EACH OTHER’S IDEAS AND TAKE THEM ON BOARD”

Year 6 pupil
New opportunities to shine
Some pupils in particular have excelled during the practical, problem solving and creative activities the project has presented, in ways that have not been possible before in school. These are children who are considered of ‘average’ ability as measured by formal tests, however they have thrived in this environment and relished the opportunity to shape their own learning. They have been immersed and engaged throughout the project, have learnt new skills, shared those skills with their peers, and carried out fountain-related research and work without being asked. For some of the children on the ‘gifted and talented’ register Fountaineers has provided a welcome challenge, with its less rigid structure and open-ended nature enabling them to participate in authentic activities and to direct their own learning.
"THEY SEEMED A LOT LESS LIKE TEACHERS, BECAUSE EVERYONE WAS FINDING STUFF OUT TOGETHER – THEY’RE MORE LIKE COLLEAGUES ACTUALLY”

Year 6 pupil

Changing relationships
A key feature of the project was to allow more freedom to experiment within a genuine spirit of enquiry and open exploration. This can take time to build and to embed within the culture of the school, and also requires understanding and empathy between all partners – external and internal – and especially between teachers and students. The freedom to take risks, make mistakes and try approaches that may not always be the most effective, needs to be perceived as a learning process in which partners learn from ‘mistakes’ but ultimately learn more valuable and transferable skills from active participation in authentic problem solving. This approach can feel messy, inevitably leading to ‘highs’ and ‘lows’, and feelings of uncertainty; however, it ultimately provides an environment in which both adults and children have the opportunity to have new and unique learning experiences and encounter the excitement of learning together. As a result we can see positive changes in the traditional relationships between teachers and learners occurring. For example, many of the older children commented that relationships seemed ‘more equal’.
5. RECOMMENDATIONS
5. Recommendations

Organising the team

A whole-school project that involves and has an impact on all pupils and staff can be very powerful in creating a sense of cohesion and shared goals. However, depending on the size of the intake it may not always be practical to work with and make all decisions at a whole-school level all of the time. Whilst whole-school involvement is necessary to ensure greater ownership and cohesion, there may be different ways of organising different people’s involvement in the various aspects of the project. This might take into account ‘age-appropriateness’, interests or a ‘layered’ set of activities, with the youngest groups being involved at key decision points and for practical activities. It may be useful to appoint a project manager or champion within the school or a steering group to act as ambassadors for the project and ensure that everyone is kept informed and involved as the project progresses. They could also provide the communication channel with any external partners.
Working with external experts

Working with external experts can add value to projects. Not only do experts bring with them skills and knowledge that may not exist within the school, they will also bring new experiences, ideas, ways of working and techniques to the project that can have a broader impact on teaching and learning across the school. Having an external input brings a sense of ‘reality’ to the project and can also help maintain momentum and raise the project’s profile.

Developing a written statement of responsibilities with external partners is useful to ensure everyone is clear about their role. Developing joint internal and external communications plans and channels with partners early on is also necessary to reduce misunderstandings and ensure the profile of the project is maintained and the progress of the project is communicated. If your design project is something for which there is no specific internal expertise then try to recruit experts to work closely with students, feeding in achievable ideas and helping to shape their designs in light of practical possibilities and constraints such as time, budget, technical aspects and so forth.
Choose an achievable end ‘product’

The process of design can be as important as the end product itself. However, it is still worth spending significant time agreeing the ‘right’ end product at the outset. The project should stretch people and present new learning challenges for all involved. It is also worth considering a project or artefact that is within reach of the school community and not too reliant on external partners or technical information that is difficult to obtain, which is more likely to engender a sense of ownership amongst staff, pupils and other project partners. It is also better if the artefact you are designing can be prototyped easily and lends itself to hands-on activities and experimentation, as this will also make it more tangible to a wider community.
Planning and time

For a project to truly be participatory it really needs time dedicated to it. Before embarking on the project make sure that you’ve spent some time on planning with staff and with students. Create a loose framework within which the project will sit, with clear milestones and regular meeting times, and also discuss how decisions are going to be made and what methods of communication will be used.

Initial plans need to be ‘loose’ enough to allow you to respond to ideas generated by participants; they should be there to guide the project, as a tool for evaluating progress, but not driving it. There needs to be enough flexibility in the schedule to incorporate all of the opportunities that will arise and the various directions the project may take. Be prepared for peaks and troughs throughout the project, and variations in its momentum. Crucially, it is necessary to allow time to respond to things that arise from students and staff and to adapt the design process on the basis of their input. Teachers will need time to work together and pre-plan for activities and explore collaborative processes and approaches. It may be useful to collapse the timetable to dedicate a day per week or a week per term to project specific activities.
Devising appropriate activities

A whole-school design project will create a raft of learning opportunities. Some of these will be tasks that are required as part of the design, e.g., deciding on a location, an artefact and so forth. Others will be specially devised activities to develop particular skills that are needed for the project – such as debating, or research skills. With a little lateral thinking there will be countless opportunities to integrate aspects of the design project into existing lessons and subjects.

At the beginning of the project, consider creating a map of all the potential learning opportunities that the project might afford. This can be used as a planning device, as a tool for dividing up the tasks that need to be done, and can be updated as the project evolves and new opportunities reveal themselves. It may also be used as an assessment device or to cross-reference to the National Curriculum schemes of work, so that the learning is driven by the project rather than a pre-defined curriculum. This effectively involves creating your own personal curriculum that surrounds the design project and makes the most use of it. It is essential to get the perspective of students in designing this curriculum, as they will see opportunities that may otherwise be overlooked, and it may also help deliver a more personalised educational approach. It will also be useful to have a dedicated person to look holistically at the project and seek out learning opportunities as they arise.
Keeping on top of decisions

Every design project will require decisions to be made, and many design decisions are not clear-cut, nor have definite yes/no answers. Decisions will often require debate and critical thinking, making them discussion-based which can be non-inclusive for very young children. You may want to give consideration to alternative ways of involving the youngest participants in decisions and devise age and ability-appropriate activities, although it is important not to underestimate the capabilities of pupils to participate in activities.

Avoid using mixed age groups for all decisions, although these may be incredibly valuable at points in the process where new ideas and suggestions about the project can be fed in. Make sure all the information required to make a decision is available so that you don’t have to cover old ground when a new constraint comes to light.

If you do need to canvass opinion from a wide range of people, using visual tools such as post-it notes to generate ideas, or sticky dots to represent preferences, is useful. In order to keep track of design decisions, it is also useful to develop strategies for capturing and documenting the process and illustrating how decisions are reached.
Some ideas for communicating, keeping track of decisions and documenting progress:

- maintain a regularly updated photo gallery or web page with captions
- make and present a PowerPoint presentation at key milestones in the project
- keep a diary – this could be a written diary, scrapbook, or a class diary; alternatively make a video diary or record it on to CD
- nominate or elect project reporters who interview people regularly and create news reports at regular intervals
- make a documentary film and publish it on the school website
- record discussions to capture all the different people’s opinions
- use the school website, or set up a project blog
- create a physical display area for the project
- let people know what’s happening through weekly newsletters
- let each class work on recording a different aspect of the project and have regular project updates in assembly gatherings
- write a book about the project.
6. Conclusions

Whole-school projects

Whole-school projects are great for creating shared goals, a sense of cohesion across a school, and situations for cross-age working and collaboration. A design project, with its inherent decision making and ideas generation, offers students many opportunities to engage in debate, make a case, compromise and listen and act on one another’s ideas.

Real design problems

Design as pedagogy, that is a learning experience which is open-ended and not prescriptive, offers multiple and varied learning opportunities and enables young people to follow their interests and abilities. The creative and problem-solving nature of a design project allows some individuals to demonstrate their abilities and skills in ways that may not normally arise. Real projects, where real decisions affect real outcomes, are potentially more engaging than a lot of the scenario-based problem-solving activities that are common in many schools.
Time and planning

Whole-school participatory projects take a long time, and need time dedicated to them to ensure that they are successful. They need planning, but the planning needs to be flexible enough to react to the direction the project takes. If students are given opportunities to participate, then it is important that they are also listened to and their input is acted upon. A schedule needs to be flexible enough to respond to issues raised by students and change direction if necessary.

Decision making

Whole-school decision making often leads to better decisions being made, even when participants are very young, and it is likely that a greater sense of ownership will be developed. However, it is not always practical to involve everyone in every decision. In the Fountaineers project, staff began to realise when whole-school decisions were essential and the best methods for ensuring input, and this has had a broader impact on school-wide decision making.

The Fountaineers project has been an exciting and challenging learning journey for the whole school community, resulting in significant engagement and changes in practice. It has shown how real design projects may be seen as valuable and unique learning opportunities for developing a wide range of skills amongst the whole school cohort, and therefore offers lessons for those involved in co-design and the redesign of learning spaces.
7. Future possibilities

One of the key aspects of Fountaineers was that it would continue to evolve and change after the fountain was built; that the opportunity to develop learner voice and independent learner-led learning was not only through the design process, but that there would be continuing impact with young people maintaining and running the fountain after construction/implementation. This is why one of the original goals was for the fountain to be re-configurable and able to be programmed by children.

The following participatory design opportunities may offer possibilities to collaboratively design something that continues to evolve and change after it has been built in order to maximise opportunities for learning:

- design a future learning space
- design a micro-society for learning (see: www.microsociety.org)
- design a product/series of projects and a business model for distribution
- design and build a vegetable garden or school farm
- design, build and maintain the school website.
7. THE STORY CONTINUES

Birds could drink out of the pool in the middle.

I don't like the fountain. It has two many steps than jets and I don't like the shape.

Sam Remfry

I like the steps.

No sensors.

Needs sensors.
The steps will be slippery.
It could be dangerous.
You could fence the hole that
we could go in and paddle.

If you was well on the sit people
will be happy.
8. The story continues: ongoing work and next steps

The fountain is currently being built and tested at Springboard Design Partnership’s workshop in Bristol. At school, students and teachers are learning how to use the programming interface and are user-testing the simulation software that is currently being developed. Each class is continuing to explore their chosen themed area that is related to the fountain, for example seating or maintenance, while teachers are working together to develop a set of learning activities that start with the fountain (effectively a ‘Fountaineering Curriculum’) and feeding them into their planning documents for the coming terms. Some of the tools and techniques introduced through the project are being incorporated into a ‘Luckwell Toolkit’, and the leadership team is redesigning the curriculum to make it more exploratory and learner-led in response to the school’s Fountaineering experience.

A second stage of action research will develop and analyse the use of the fountain in the first six months after installation.
Further reading

The Fountaineers project touches on many current themes in education as well as fountain design, technology, programming, participation etc. Here is a selection of books, articles and web links that have informed our thinking and development of the project.

Catherine Burke and Ian Grosvenor (2003). The School I’d Like. Routledge


Joined up Design for Schools. Merrell John Thackaray (2007). Wouldn’t It Be Good If... Dott07. Design Council


Relevant Futurelab publications:


www.futurelab.org.uk/resources/documents/handbooks/designing_with_users.pdf


Personalisation and Digital Technologies (2005). Hannah Green [Demos], Keri Facer and Tim Rudd [Futurelab], Patrick Dillon [University of Exeter], Peter Humphreys [Personalise Education Now].

www.enquiringminds.org.uk/pdfs/Enquiring_Minds_guide.pdf

For more information on the Fountaineers project see: www.futurelab.org.uk/projects/fountaineers

Web links:

Allison Druin and the Human Computer Interaction Lab at The University of Maryland: Children as Design Partners. www.cs.umd.edu/hcil/kiddesign

Growing Schools – a website which has been designed to support teachers in using the ‘outdoor classroom’ as a resource across the curriculum for pupils of all ages. www.teachernet.gov.uk/growingschools

Lifelong Kindergarten – MIT Media Lab – new technologies that expand the range of what people can design, create, and learn. llk.media.mit.edu

Google SketchUp: sketchup.google.com

LEGO Mindstorms: mindstorms.lego.com

DrawBots:
www.boingboing.net/2006/10/04/the-finkbuilt-drawbo.html

Creative Partnerships:
www.creative-partnerships.com

Learning through Landscapes:
www.ltl.org.uk

Building Schools for the Future:
www.bsf.gov.uk

Luckwell Primary School:
www.luckwell.bristol.sch.uk

Stakeholder Design:
www.stakeholderdesign.com

Springboard Design Partnership:
www.springboard-design.com

Apollo Creative:
apollocreative.blogspot.com
Background

Fountaineers was developed as part of Futurelab’s Call for Ideas, open for anyone to submit an idea for innovative ways of teaching or learning with technology. Successful ideas receive funding and support in the form of creative input, learning research, user-centred design, and technological expertise to develop them into working prototypes, which are then trialled and evaluated with learners.

Development and research on the Fountaineers project was carried out in partnership with Luckwell Primary School and Sean McDougall of Stakeholder Design, who also submitted the original idea.

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Futurelab is passionate about transforming the way people learn. Tapping into the huge potential offered by digital and other technologies, we are developing innovative learning resources and practices that support new approaches to education for the 21st century.

Working in partnership with industry, policy and practice, Futurelab:

- incubates new ideas, taking them from the lab to the classroom
- offers hard evidence and practical advice to support the design and use of innovative learning tools
- communicates the latest thinking and practice in educational ICT
- provides the space for experimentation and the exchange of ideas between the creative, technology and education sectors.

A not-for-profit organisation, Futurelab is committed to sharing the lessons learnt from our research and development in order to inform positive change to educational policy and practice.

This publication is available to download from the Futurelab website – www.futurelab.org.uk/projects/fountaineers.

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