

Examples of successful public engagement: additional evidence submitted to the Science and Technology Committee (Science Communication) by the National Coordinating Centre for Public Engagement (NCCPE)

September 23rd 2016

Following the [evidence session](#) on 7th September the National Coordinating Centre's Director, Paul Manners, was invited to submit evidence of examples of successful public engagement with science. This paper provides links to a variety of examples.

The examples fall into two categories:

Examples of public engagement in practice: projects which demonstrate success in how public engagement can be planned, delivered and evaluated

Examples of successful strategic support for public engagement: examples of ways in which institutions are working individually or collectively to create the conditions for excellent public engagement with science to be delivered.

1. Examples of successful public engagement projects

It is [widely agreed](#) that the hallmarks of excellent engagement include:

- A clear sense of purpose
- A clearly defined 'public'
- A choice of method appropriate to the purpose and public being engaged with
- Use of evaluation to help refine the design and delivery of the activity, and to review its impact and implications for future practice

Examples of the **purposes** public engagement can serve include:

- **Informing:** Inspiring, informing and educating the public, and making science and research more accessible
- **Consulting:** Actively listening to the public's views, concerns and insights
- **Collaborating:** Working in partnership with the public to solve problems together, drawing on each other's expertise

The scope of public engagement is therefore very broad. We have chosen a handful of examples to represent this diversity, using two sources:

- The NCCPE's [Engage competition](#), which celebrates public engagement with research
- The [REF Impact case study database](#), containing over 6440 impact case studies submitted as part of the 2014 Research Excellence Framework exercise, many of which include examples of engaging with the public as a route to realising social impact.

The NCCPE's Engage competition

Every two years the NCCPE runs a competition to celebrate excellence in public engagement with research. We are currently shortlisting finalists for the 2016 competition.

The 2014 competition attracted over 220 applications. There were nine category winners and one overall winner. Short videos of all the shortlisted entries can be accessed [here](#). We have picked out three examples to represent the diversity of approaches represented.

The Caer Heritage project: overall winner and winner of the Art, Design and Culture category

University of Cardiff



Caerau Hill Fort is nestled deep in a west Cardiff suburb, surrounded by houses, and is one of the most important, yet little understood, prehistoric monuments in the region. In 2011, archaeologists and historians from Cardiff University teamed up with local community organisation ACE (Action in Caerau and Ely), local residents and schools to establish the CAER Heritage Project, to explore Cardiff's prehistoric past and put local people at the heart of cutting-edge research. Surrounded on three sides by the housing estates of Caerau and Ely, the ramparts of Caerau hillfort are hidden beneath woodland, a fact that means many people don't even realise it is there. The estates that surround the hillfort are home to more than 25,000 people and, despite strong community ties, many local residents are challenged by significant social and economic deprivation, particularly high unemployment.

From the outset the project's key objectives have therefore been to employ archaeology and history to develop educational opportunities and to challenge stigmas and marginalisation associated with these communities. The project has involved community participants in a variety of co-produced projects, including geophysical surveys, Iron-Age themed art installations, museum exhibitions, adult learners courses, heritage trails and a large scale community excavation. Judges thought this project was a great example of co-production, that really put local people at the heart of the research. The project brings the west Cardiff community together and has had a lasting impact on all of the organisations involved. Judges were also impressed with how the project has emerged and evolved as opportunities were realised.

[Link](#)

What if...?

University of Durham



What if...? was an exploration of young people's curiosity and creativity, attributes shared between science and the arts. The project culminated in the development of a live interactive performance piece, produced through collaboration between 20 young people from Greenfield Community College (Newton Aycliffe, County Durham), teachers, theatre makers (Unfolding Theatre) and scientific researchers (Durham University).

At its core, was the aim of encouraging the young people to explore their own curiosity and interests rather than follow a pre-determined path or pre-set scientific subject matter, providing opportunities to determine their own personal learning journeys. They were challenged to develop and direct the production of an interactive performance piece aiming to engage and inspire their peers. The resultant content was developed through collaborative interactions with scientific researchers and creative practitioners, all the while maintaining ownership with the young people. The performance piece challenges audiences to explore their own curiosity, and investigates the research, personal journeys and daily experiences of two contributing scientists.

So far, it has reached over 1,000 people in school and community groups. What if...? demonstrates that trusting and supporting young people to realise their own curiosity and creativity can result in unique and inspirational methods of engagement.

[Link](#)

Danceroom Spectroscopy (dS)

University of the West of England BRISTOL and University of Bristol



Much of modern science is concerned with the study and manipulation of microscopic phenomenon. For many scientists, the invisible world is as familiar as the visible world but for the general public this is not the case.

danceroom Spectroscopy (dS) is a cutting-edge, interactive public engagement project that invites members of the general public to literally step into an interactive atomic simulation. With its origins in computational atomic dynamics research, dS now forms a major attraction at premier cultural and educational settings within the UK and internationally.

Public engagement has been made possible by visualising the state of rigorous scientific simulation algorithms in real-time and linking them with state-of-the-art 3d capture cameras to interpret images of participants as energy fields. Using their energy fields, people are able to manipulate the simulation in real-time, generating sound and image with their movements, arousing curiosity and inspiring questions on the cutting-edge of both science and art.

[Link](#)

Other entries illustrating the diversity of approaches to excellent public engagement include:

[Conker Tree Science](#): a novel, hypothesis-led citizen science project which engaged c.8,000 people with a pressing ecological problem through participation in real science. The first scientific paper using the data, and establishing a framework for future hypothesis-led citizen science, was published in PLOS ONE in 2014

[The Enlightenment Café: Deadinburgh](#) introduces the audience to the worlds of epidemiology and biomedical science through a night of immersive theatre. An unknown pathogen ravages Scotland's capital, turning the unlucky souls into bloodthirsty ambling beasts. You are one of the last uninfected citizens in the city. Now, with help from real scientists, you have only hours to decide how to save Edinburgh, and perhaps the world.

[Focus on the Positive](#) is a public event where the audience chooses how to change the world. At each event, a handful of UCL's inspiring researchers explain exactly how they want to tackle the big issues in our world. The audience grill the speakers on stage and face-to-face before voting for what they'd like to support.

The 2104 REF exercise led to the production of over 6400 case studies demonstrating the impact of research on society. These case studies are available to browse through an online database.

Each case study is four pages long, and provides:

- A summary of the impact
- A description of the underpinning research
- A summary of the impact realised
- References to the underpinning research and sources to corroborate the claimed impacts

Collectively, the case studies provide convincing evidence of the extent of public engagement with research and useful insights into how the higher education sector is delivering public engagement and articulating its value. **Nearly half** feature some engagement with the public, ranging from relatively light touch interaction with the media to share research findings to significant, sustained public engagement programmes.

Some examples

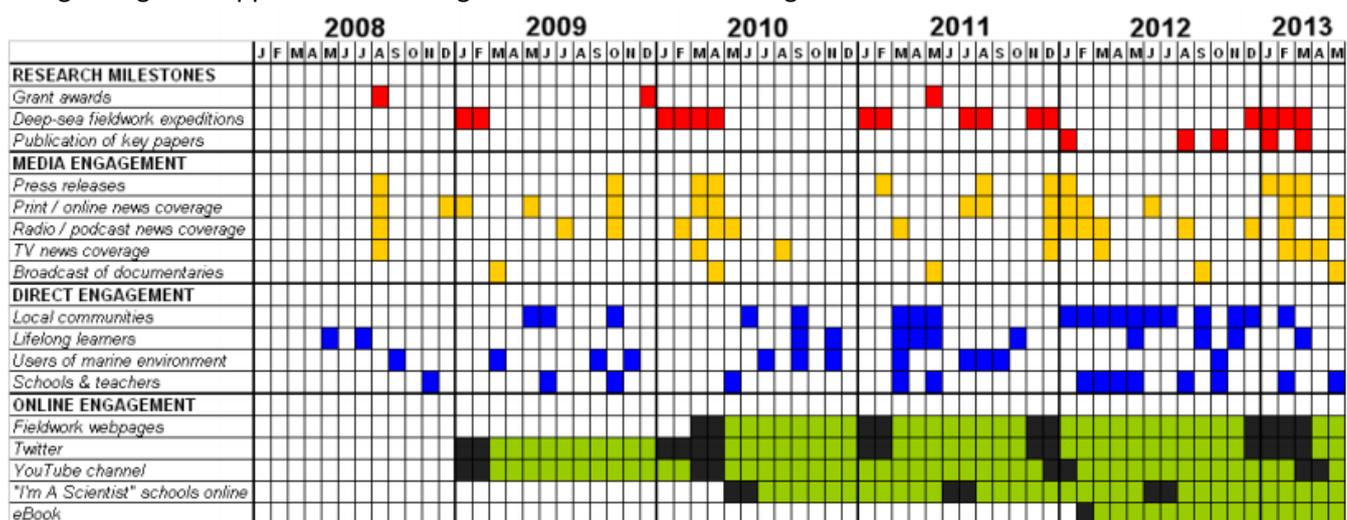
There are many examples of public engagement where either individual researchers or larger teams or departments describe a sustained programme of engagement with the public, and offer evidence of the impact achieved.

**Explore the Deep: Public Engagement with Deep-Ocean Research
University of Southampton**

This case study describes a sustained programme of public engagement with research delivered by Ocean and Earth Science researchers at Southampton over a number of years. Particularly impressive is the strategic approach to linking the engagement to key research milestones; the careful identification of different audiences and purposes; and the creative blend of methods and approaches deployed to realise their objectives.

‘By putting public engagement at the heart of our deep-sea research, we have delivered benefits to society of generating inspiration and curiosity about science, raising public awareness of our research insights and their context, and providing cultural enrichment by supporting lifelong learning. We have achieved these impacts through: interactions with print, online, and broadcast media that have brought our research to millions; series of talks and events that have inspired specific audiences of tens of thousands; and a network of interactive online resources that has enabled people worldwide to share in our exploration of deep-ocean environments and their biodiversity.’

The case study includes a summary timeline capturing the key activities over a 6-year period, evidencing the value of taking a long term approach to building momentum and sustaining interest and involvement:



The case study provides evidence to corroborate the claimed impacts, including quantitative measures of ‘reach’, demographic data, and some qualitative feedback to capture the depth and nature of engagement realised

[Link](#)

The Open Air Laboratories (OPAL) project and its contribution to raising public awareness of, and participation in, freshwater science

UCL

This case study describes a really impressive ‘citizen science’ project, bring together university researchers, an extensive partnership of civil society organisations and a diverse group of volunteers:

‘The OPAL Water Centre at UCL, funded to a total of £732k, developed an innovative educational national water survey programme accessible to people of all ages and abilities, promoted especially within disadvantaged communities. Of the more than 45,000 participants, 17% were from ‘hard to reach’ communities. The Survey encouraged greater understanding of the aquatic environment through public participation in water quality and aquatic biodiversity assessment and used high-quality research to link the community, voluntary and statutory sectors by creating a channel through which locally derived information could lead to site-specific management as well as national and international policy’

Particularly impressive is the commitment shown to reaching ‘underserved’ audiences and to engage them in meaningful, purposeful science which in time led to significant impact on policy.

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Many of the case studies feature what might be described as ‘blended’ public engagement, where the public engagement forms part of a wider knowledge exchange project – e.g. to engage patients, policy makers and health care professionals around a particular health issue

Towards prevention of mitochondrial diseases: changing government policy and influencing public debate. University of Newcastle

This case study describes the extensive programme of public engagement linked to research into mitochondrial disease at Newcastle University. The case study provides an excellent example of how different engagement methods need to be deployed for different purposes. In this case, the team engaged initially in extensive consultation and dialogue to explore public attitudes and values. Later in the project, the engagement focused on sharing the findings of the consultation and communicating the complexity and value of the new techniques:

‘Research at Newcastle University, the only centre licenced in the UK, has shown that the in vitro fertilisation-based technique of pronuclear transfer to prevent the transmission of mitochondrial disease from mother to child is feasible. As a consequence, the UK Government asked the regulator responsible, the Human Fertilisation and Embryology Authority (HFEA), to conduct both a scientific safety review of the techniques in which Newcastle research was widely referenced and to undertake a public consultation exercise. The findings from both these consultations and from a separate Nuffield Council on Bioethics report were supportive, to the extent that in June 2013 the UK’s Chief Medical Officer announced that the Government would bring forward draft legislation to change the law in the UK to allow embryos created using the Newcastle approach to be used for the treatment of affected couples’

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Our review of a sample of these case studies identified the following features as being characteristic of excellent accounts:

What?

- A convincing account of the significance of the research: why it matters beyond academia. Who should care about it? What is distinctive about its potential?

Where?

- An explicit, intelligent acknowledgement of the external context, and a clear grasp of the potential contribution of the research to influence thinking, practice and people's capabilities

Who with?

- A clear articulation of the key publics and partners involved and a rationale for their involvement, with evident insight and knowledge about their interests, motivations and needs in relation to the research

Why?

- A confident sense of purpose animating the engagement that underpins the impact claimed

When?

- An intelligent sense of timing to maximise the potential impact of the engagement activity, with activities differentiated by the phase of the research

How?

- Drawing on appropriate methods, tailored to purpose, context and the publics they are seeking to engage

With what impact?

- Able to talk convincingly about the difference it has helped to generate, and making credible claims for the contribution made by the research

The case studies also provide evidence of the distinctive ways in which public engagement with research generates impact and value for society. We have built upon an [impact framework](#) developed by ESRC to identify key ways in which this impact is being realised in three broad domains: the conceptual, the instrumental and through capacity building. By successfully engaging and involving the public in research the following outcomes can be realised:

Conceptual impact: stimulating fresh thinking and sense-making; re-framing debates

- Challenging conventional wisdom
- Challenging professional orthodoxies
- Changing understandings
- Stimulating learning and reflection
- Influencing public debate

Instrumental impact: influencing products and services and how things get done

- Changing standards / regulation
- Changing accountability regimes
- Influencing new products and services
- Changing policies
- Changing planning processes

- Influencing the public realm

Capacity building impact: Influencing skills, behaviour and collaboration

- Inspiring participation and progression
- Teaching new skills
- Changing behaviours, including participation and involvement
- Influencing practitioner and policy makers' behaviour /practice / standards
- Fostering collaboration

2. Examples of success in strategic support for public engagement

While it is important to identify and celebrate examples of excellent public engagement practice, it is also critical to ensure that there is excellent infrastructure and policy in place to support such activity. Picking up on a point made by James Wilsdon in the first evidence session, public engagement will suffer if is not encouraged and validated by employers and peers. Significant effort needs to be made to incentivise, reward, recognise and support it. Good communicators / engagers need to be encouraged to see this as a core part of their professional activity as a scientist – not an 'add on'.

We have already submitted two responses to the Committee, one on behalf of the [NCCPE](#) and one on behalf of the [National Forum for Public Engagement in STEM](#). Both are working hard to ensure a culture that supports excellence in public engagement is in place. Our responses detailed the various ways in which both are working to drive culture change and to support innovation and excellence.

So how well are we doing to build strategic support for public engagement, and how might government help?

The NCCPE has been taking stock this year of progress to embed support for public engagement in the HE sector. Evidence from the recent [Factors Affecting Public Engagement by Researchers Survey](#) and a roundtable event in July convinces us that:

Public engagement is beginning to become integrated in science funding, not an add on

- It is increasingly possible to access funding for public engagement through RCUK's Pathways to Impact and the Research Excellence Framework
- Research Councils like the Arts and Humanities Research Council (AHRC), the Natural Environment Research Council (NERC) and the Science and Technology Facilities Council (STFC) have recognised that they need to invest strategic funding to support public engagement activity
- Wellcome is raising the bar with its [Provision for Public Engagement](#) and [Institutional Strategic Support Fund](#) to encourage institutions to invest in strategic support for public engagement
- Public involvement is now a condition of funding for many health funders

Achieving common purpose remains a challenge.

While we should be encouraged by seeing a thousand flowers blooming and lots of high quality engagement activity, there is a risk that there is lots of reinvention of wheels, and a lack of coordination. The NCCPE works hard to capture learning and share it across the university system, to accelerate progress. The National Forum for PE in

STEM was established to bring more coherence to the engagement activities of its members, and to address critical areas where we could see rapid improvements in our collective effectiveness, for instance in evaluation. As a result:

- We are seeing increasing alignment between funders – the Forum for PE in STEM sees the major funders and deliverers of PE in STEM working together; the NCCPE is supported by a consortium of funders including the HE Funding Councils, RCUK and Wellcome
- The [Concordat for Engaging the Public with Research](#) is a common statement of principles, and has over 40 signatories and supporters.

This is really encouraging, and the direction of travel is positive.

But there are challenges too – structural ones, which strategic investment can help us address proactively, and where government could help. These include:

- **Quality:** public engagement is a craft, requiring expertise and skill. We need to invest more in helping people develop their skills, to create new roles with real expertise in this area; and in evaluation and research into ‘what works’
- **Capturing impact:** We are still developing robust ways to evaluate impact. Significantly more work needs to be done to both increase the basic evaluation literacy of the scientific community, and to invest in the development of more sophisticated methodologies, for instance to enable us to capture the longer term impacts of our investments in public engagement
- **Cost:** Some of the most valuable forms of engagement are expensive and time consuming: it can take months if not years of work to build trust and mutual understanding before it really pays off. We need to get better at working out when and why it is worth going the extra mile to invest in these
- **Culture:** Professional cultures are slow to change. For some working in science, public engagement remains a distraction or irrelevance. This has to be factored into the equation. Culture change programmes like the NCCPE and the Forum can really help by ensuring learning is rapidly synthesised and moved around the system to accelerate change and create common purpose. But strong leadership is also needed.

One particularly significant development is work the National Forum for PE in STEM is coordinating, in response to a request from Sir Mark Walport. He hosted a roundtable which identified 6 priority areas of emerging science where a sustained, long term and coordinated approach to public engagement would be beneficial:

- Synthetic biology and nanotechnology;
- Data science (including big data, open data, smart software, data analytics and machine learning);
- Autonomous vehicles and systems;
- The Internet of Things and robotics;
- Biomedical and reproductive technologies and genomics;
- Environmental issues including food, air and water quality, weather and climate.

Much public engagement has already been carried out in these areas, or is planned – but in a piecemeal way. Two **working groups** have been established to progress work in two specific areas. The Wellcome Trust is leading on **Genomics and Gene editing** and the Royal Society on **Machine Learning**. The groups are clarifying the scope for Public Engagement in these areas, assessing what is already in place or planned, and are identifying areas for coordination or collaboration in order to more effectively target and engage audiences.

How can government help to accelerate a culture of excellence, to support successful public engagement?

To sum up, we believe government has a key **leadership role** in setting high-level strategy and championing the importance of effective public engagement and high quality science communication. By playing this role, government will:

- enhance its own use of science and ensure it is socially sensitive
- provide an example to others
- influence funding and policy and drive positive change
- pump prime innovation
- encourage common purpose and alignment

It is important to credit the work of the BIS Science and Society team over the last 8 years which has made a significant contribution by bringing together people working in this area to learn from each other and identify shared principles. An example is the [Charter for Science and Society](#) which identified three important principles to guide our collective work

- PRINCIPLE 1: Organisations adopt a strategic commitment to improving the relationship between science and society
- PRINCIPLE 2: Organisations and individuals are enabled to participate in activities and have appropriate training, support and opportunities
- PRINCIPLE 3: The signatories and supporters undertake to monitor and evaluate impact in order to continuously improve the relationship between science and society across the UK

The National Forum is a key intervention that builds on these foundations – partly supported by BEIS, but also by contributions from all the members, which includes representatives from all four nations. This provides a really significant platform for collaboration.

We should also be proud of the innovation that the UK has demonstrated in this area. The UK is seen internationally as a world leader in its approach to public engagement. Investments like Sciencewise and culture change programmes like the NCCPE are almost unique and the envy of other countries.

The committee could make a significant contribution to consolidating and extending this work if its recommendations helped to realise:

- A convincing articulation of WHY public engagement with science is so critical to our future prosperity and wellbeing, with strong leadership promoting this across government and beyond
- Stronger alignment and coherence across the different areas over which government has influence: currently there are many of strands of investment, which could be more purposefully aligned to deliver greater collective impact
- Continuing investment in strategic functions that support excellence and innovation – like Sciencewise, The National Forum, the BSA and the NCCPE. Such organisations play a critical role in ensuring that successful public engagement is supported and delivered.