



Evaluation of *Imagining* ***the Sun* workshop**

Example of outcome/impact evaluation

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Date

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Summary

The following document provides a very brief overview on aspects of evaluating public engagement activities. In the near future, more detailed resources will be available following on from the SOLARNET Public Engagement workshops (and this document will be updated accordingly). The main purpose is to provide an example of an evaluation that can be used with the Imagining the Sun workshop (see *Imagining_the_Sun_workshop_manual.pdf*).

Why do evaluation?

Evaluation is an important part of any project. For public engagement activities that hope to make some impact on their audiences, it is a very useful tool. Engaging with evaluation and using it with your public engagement will enable you gauge how well your activities are doing, examine whether you are achieving the outcomes and impact you want, and provide an opportunity to reflect critically on what you are doing. A well-considered program of evaluation will also enable you demonstrate your activities achievements; whether this is to funders, your institute or the wider community.

Resources for developing your own evaluation

Ideally, before undertaking your outreach activity, you should spend time creating a plan for evaluation that is suited to your specific situation. This will help you decide upon the best way to design and deliver your activities in order to reach and engage your target audience. Furthermore, it provides an opportunity for you to think about how you might capture the right information to demonstrate the outcomes and impact of your activities.

Within the UK, there is the *National Co-ordinating Centre Public Engagement* (<https://www.publicengagement.ac.uk>), which was set-up to help research institutes with public engagement and has many useful resources for all aspects of public engagement. Some of these resources are open-access. For guidance on creating an effective evaluation of your project, we provide some links to a number of useful resources worth reading:

- *How to evaluate public engagement projects and programmes* - https://www.publicengagement.ac.uk/sites/default/files/publication/evaluating_your_public_engagement_work.pdf
- *Evaluating your engagement activities: Developing an evaluation plan* - http://www.engagement.manchester.ac.uk/resources/engagement/evaluating_public_engagement/Evaluating%20Your%20Public%20Engagement%20Activities.pdf
- *Evaluation: Practical Guidelines (A guide for evaluating public engagement activities)* - <https://www.ukri.org/files/legacy/publications/evaluationguide-pdf/>

Evaluation of the Imagining the Sun workshop

We have provided an example of a simple evaluation that can be undertaken with the Imagining the Sun workshop. The evaluation takes the form of two surveys, but this is not the only way to collect data (see the above resources for other ideas). The benefit of surveys is that it is relatively simple to collect and organise data, and allows you to see impacts on an individual.

Motivation Our motivation for designing the evaluation this way is because we were interested in whether our interactions with the children led to any change in their views on science as a potential career. Research suggests that children’s *science capital*, which is, in short, a sum of all their experiences and attitudes towards science, plays a key role in their continued participation and engagement with science (see Note A). Hence, ideally the outcome of our interactions would support children’s science capital. In practice, measuring a child’s science capital is difficult, however by examining previous research we settled on the given design.

Design Each survey has two parts, a structured question and answer part and a part for free writing. In the first part, we provide a number of statements that the children can decide how they feel about. The statements are designed to examine aspects of the child’s science capital, and the aspect that each statement addresses is given in the following table:

| Statement | Reasoning |
|--|--|
| <i>I think science is interesting</i> | Assess child’s interest in the subject |
| <i>I could be a scientist when I am older</i> | Assess child’s view of themselves with regards to science |
| <i>I would like a job in science when I am older</i> | Assess whether the child is interested in pursuing science |
| <i>Science can help us understand the world around us</i> | Assess child’s view of the usefulness of science |

The children can then express their agreement with the statements through a Likert scale. It is entirely possible to add more statements and widen the analysis. Careful thought should be given to what you are interested in finding out and how to capture that in a simple, non-ambiguous statement.

The second part is a free-writing box and is there to assess how the child’s *knowledge* of the science of the Sun changes. The motivation for its inclusion is to allow the child some creativity in their answers. The outcome we are looking for is that the child will include more scientific knowledge in their post-workshop response than is present in their pre-workshop response.

Implementation There are two surveys, for pre-workshop and post-workshop. Ideally, you would ask the children’s teacher to arrange for the children to fill the pre-workshop survey in before you visit them, and

then the post-workshop once you have visited. Avoiding having to complete the surveys on the day means there is more time available for the workshop to take place. Perhaps more importantly, it also means that you can see slightly longer-term changes in children’s attitudes, reducing the effect of on-the-day excitement of a visitor into the classroom, and also bias caused by the children’s desire to ‘please’ the visitor (known as demand characteristics).

Analysis The pre and post survey are the same, in order to provide a straightforward comparison between children’s attitudes and knowledge. The analysis of the Likert scales can be done with various statistical tools and there is standard practice to follow in order to look for increases (or decreases) in the each area. The analysis of the free-writing box is not so straightforward.

One possible way to evaluate the quality of science content in the free-text is to use ‘comparative judgement’. A number of judges are presented with (in this case) two texts and are asked to choose the one that has more scientific content. Each judge will see a range of different texts. The scores are then combined and the texts are then ranked on the scores. This kind of analysis can be set up with online software, e.g. <https://www.nomoremarking.com>.

Finally, we note the presence of the following table on the survey:

| | | | |
|---------------------------|----------------|------------------|------------------|
| First letter of your name | Favourite Food | Favourite animal | Favourite colour |
|---------------------------|----------------|------------------|------------------|

This is present in order to anonymously identify the students pre and post surveys, which enables pairing of the data and permits the use of statistical analysis that focuses on paired data. It means that you don’t have to collect children’s names or other identifying feature which reduces data protection issues.

Notes

- A. The factors that lead to children wanting to continue to study science past compulsory education and undertake science related careers is still the subject of research (for example, see the ASPIRES project in the UK <https://www.ucl.ac.uk/ioe/departments-and-centres/departments/education-practice-and-society/aspires-research>). However, the concept of science capital has been developed to try and account for the different science resources, attitudes and experiences of children (<https://www.ucl.ac.uk/ioe/departments-and-centres/departments/education-practice-and-society/science-capital-research>).