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**A wild
and fertile
ground**

spokes

- spokes**, noun, plural of spoke
1. One of the rods or braces connecting the hub and rim of a wheel.
 2. *Nautical* One of the handles projecting from the rim of a ship's steering wheel.



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Proving it

A beginner's guide to measuring the impact of our institutions

Science centres and museums are intriguing places that can kick start curiosity about the natural and human-made world for visitors of all ages and backgrounds. Our institutions have nothing short of a profound impact on visitors.

It's safe to say that most professionals in the public engagement with science field hold the above statements to be true, but financial backers are less likely to take these accolades at face value. In essence, they will ask: Does your institution really have an impact and, if so, can you prove it?

How can we measure the impact of a science centre or museum in a practical way? This is the question that has been asked to Marie Hobson, Learning Evaluator at the Natural History Museum in London, UK, and the Chair of Ecsite's REV Group for research and evaluation.

Put yourself in the place of an employee from a small science centre or museum with no evaluation department. Your director says to you, "give me evidence that we have an impact on our visitors." What do you do?

The first thing to do is clarify what they mean by "impact". Do they mean a change in levels of interest, understanding, behaviour etc.?

What is the difference between those things?

Ultimately, institutions want to demonstrate they are having a long-term impact on visitors –by improving students' exam grades, affecting career choices, etc.

However, how realistic is this, given that a one-off museum visit is part of a vast learning landscape? John Falk, a professor and writer specializing in free-choice learning and science education, is currently conducting an International Science Centre Impact Study in collaboration with 16 science centres around the world. In the meantime, the Wellcome Trust, UK, suggests individu-

Ecsite's Thematic Groups develop organically from within the network fuelled by the energy and professional interests of members.

The REV Group, created in 2011, works to refine the self-reflexivity of the science communication field through research and evaluation.

Don't miss: The REV Group Pre-Conference Workshop preceding the Ecsite Annual Conference, 20-21 May 2014, The Hague, Netherlands.

The International Science Centre Impact Study is an international piece of research involving 16 institutions from 13 countries.

The study is designed to determine if experiences at science centres increases engagement with science in and outside formal education and the workplace, and whether science engagement institutions improve knowledge and understanding of science and support creativity and problem solving. The research takes an epidemiological approach by looking for correlations between outcomes and a range of science centre experiences of differing types and intensity. Results of this research will be presented at the Ecsite Annual Conference 2014.

al institutions focus on more measurable short-term impacts which could be viewed as the stepping stones towards achieving longer-term impacts. For example, if you want to increase the number of students who study science, you need to demonstrate to them that science is fun, relevant and something they can understand – these outcomes are easier to measure than causal relationships between museum visitation and subject choices.

Let's talk about the short-term impact, then. What methods can we use?

The methods you use will depend on what you want to find out, why you want to find it out, for whom you are finding it out, [as well as] time, staffing and budget.

If you are short of time and money, a simple feedback form or online survey will give you some top level results relatively quickly and simply. When visitors are asked to tick boxes and leave a couple of comments, you can easily scan the responses to see if you are getting more "likes" than "dislikes" and you can provide some basic stats, such as "80 per cent of visitors said they enjoyed their visit", which pleases funders and senior management.

However, that data isn't particularly useful. It doesn't tell you *why* 80 per cent enjoyed it or *why* 20 per cent didn't, therefore, you don't know what was successful and unsuccessful about your offer. Interviewing visitors allows you to explore the reasons behind their opinions and will give you much richer and more useful data. Try out your questions on colleagues first, then visitors, to find any which participants do not understand or find hard to answer. Don't expect to get the perfect set of interview questions the first time.

So what questions should we ask, if we want to be as perfect as possible (even the first time around)?

Again, this will depend on your definition of impact. Does the institution have a mission, set of aims and/or some

features

12

Is he learning?
There are lots of ways to find out.
Photo: Heureka Science Centre,
Vantaa, Finland.



Visitors answer a question
at the Natural History Museum, London, UK.

learning outcomes it wants its visitors to leave with that you need to base your questions around? Though, be careful, if you set out to look for something, chances are you will find it!

To avoid missing unintended or surprising outcomes and to avoid biasing the visitor, start with open ended, broad questions, such as “did you find out anything new or surprising?” before asking more specific questions. If you want to find out something very specific, such as “Having visited the exhibition, can you tell me what scientists do at the Museum?” make sure you ask the visitor to give you an example of how the exhibition showed them [a concept]. That way, you know whether or not they are just agreeing with you to give a perceived “correct” answer.

[Are there any questions we should not ask?](#)

There are five types of questions to avoid.

- 1 **Loaded questions:** Try not to bias your visitor with questions such as “we have just spent 1 million euro redeveloping this gallery with state-of-the-art technology, do you like it?”
- 2 **Iceberg questions:** Don’t overwhelm visitors with huge, difficult questions like “should the government invest more in scientific research?”
- 3 **Slap-in-the-face questions:** Don’t insult your visitor with questions, such as “how old are you?”; “how much do you earn?” etc. If you want to know their age, make a guess or ask them to select an age group. If you are interested in their income, you could ask them what job they do.
- 4 **Double-barrelled questions:** Don’t ask two questions in one, for example, “do you like visiting science centres and art galleries?”. Visitors may like seeing one but not the other and won’t know how to answer the question (and you won’t know how to analyse the answer.)
- 5 **Hypothetical questions:** Avoid questions relating to future behaviour, such as “do you think you will visit this exhibition again?” Visitors are more likely to say “yes” if they have just had a positive experience, so you have no idea whether they will actually do as they say.

[Now that we know what to ask, let’s talk about how to encourage visitors to participate in evaluation.](#)

You could take two contrasting approaches to this. One is to integrate the evaluation into the overall visitor experience wherein visitors do not realise they are taking part in an evaluation exercise, they just see it as another museum-based activity.

For example, during an event at the Natural History Museum, London, where children visited different tents to complete activities, I set up an evaluation tent to blend in.

Alternatively, you could emphasize the fact that the visitor is helping the museum improve and that they are in a unique and privileged position to be asked their opinion. During prototype testing of exhibits at the Science Museum, London, conveying the idea that the visitor was getting to go ‘behind-the-scenes’ and see an exhibit before it was put on display was exciting for participants.

And, of course, offering some sort of incentive, such as a free gift, exhibition tickets, or money, can also help!

[If someone is unsure of how to do such an evaluation is there any place to get some insight?](#)

Yes, Ecsite’s REV Group was set up to stimulate and help facilitate research and evaluation in science museums and centres across Europe. I suggest they join our LinkedIn group to ask questions and share expertise with other museum evaluators and attend the REV Group’s Pre-Conference workshop at the Ecsite Annual Conference 2014 to develop their knowledge and skills further.