Royal Academy of Engineering | Ingenious

# Evaluating your Ingenious project

# Introduction

## This document provides some basic guidance for planning and conducting the evaluation of your Ingenious project. For more information, please contact the Academy's evaluation consultant Ben Gammon on benjamin.gammon@btinternet.com

### Time spent in reconnaissance is rarely wasted

Before you collect any data or even choose your methodology, you need to carefully consider each of the questions in this sequence.

1. What do we **need** to find out in order to meet the requirements of the Academy (and our other funders)?

2. What do we **want** to find out to help us improve our future public engagement practice? For example, how to work with engineers, how to engage specific audiences, how to use new engagement techniques.

3. What information can we gather that will help us with future fundraising? For example, data that demonstrates we understand the needs and wants of our audiences, the challenges of engaging them with engineering, the strengths and weaknesses of different engagement techniques.

4. Who do we need to collect data this data from, where and when? What challenges will we face persuading these people to take part and to give us honest, thoughtful responses?

5. Are we seeking quantitative data from a large sample of participants and/or in-depth qualitative data?

6. How much resource can we allocate to this evaluation – staff/volunteer time and money?

7. What are the best methods to deliver the objectives set out in questions one to three, within the constraints set out in questions four to six?

8. How will we share our findings and embed them into our future public engagement practice?

You should divide whatever time you have available to allocate to the evaluation of your Ingenious project into thirds.

- A third of your time should be spent **planning**: reflecting on the questions outlined above; completing your Ingenious Project Planning Template; designing your evaluation tools; and arranging who will collect data from whom, where and when.
- A third of your time should be spent **collecting data**: conducting interviews, observations, and focus groups; distributing and collecting questionnaires; and collating data from bookings systems, web usage statistics.
- A third of your time should be spent **analysing the data** and **writing up a report** summarising your findings.

## Choosing the best methods

Once you have carefully considered questions one to six above – ideally in consultation with your colleagues and project partners – you are ready to decide which methods to use to conduct your evaluation.

It is always best to use two or more methods as each one has particular strengths and weaknesses. There is no such thing as a magic method that costs no money, takes no time, and requires no planning and no effort to recruit participants. When choosing your methods, you need to consider:

- How much staff/volunteer time you have available?
- How much money you can spend on the evaluation?
- What sort of information you are trying to gather – from how large and diverse a sample?
- When and where you can feasibly conduct the evaluation?

## Good practice in recruiting participants

People often worry about their audience not enjoying the experience of taking part in the evaluation. As a result, they end up designing evaluation methods that will yield trivial and unreliable data, for example putting stickers on a wall, throwing balls into buckets or, in one case, using a marble run to (supposedly) answer questions.

If you follow the good practice in recruiting participants set out below, you won't need to make any extra efforts to make the experience 'fun'.

- Choose a time and place that is comfortable and convenient for your respondents.
- Quickly and clearly explain who you are, how you want them to help you and why you are doing this. Thank them for agreeing to take part.
- Smile and make eye-contact; don't apologise, cajole or beg; be confident. If you convince yourself that people will be happy to help, you will convey that confidence to the people you approach. And be OK with 'no'. Some people will inevitably say no to your request. It's not personal, just move on to the next person.
- Reassure them about how long the evaluation will take. A face-to-face interview should last no more than four minutes – any longer and you should provide seating and consider some sort of thank you.
- If need be, reassure them that you aren't going to test their knowledge or be offended if they didn't like something.
- Ensure that the questions you ask are well designed – easy to understand, relevant to the respondent's experience and not intrusive or threatening to their self-esteem (see the bad question quiz for examples of things to avoid).
- Show that you are paying careful attention to their answers and trying to record them accurately.
- If you are using a self-completion questionnaire, provide pens or pencils – consider using branded pens or pencils that people can take away as a small token of your thanks.

| Method | Advantages | Disadvantages |
|---|---|---|
| **Observation** | Provides a more reliable assessment of what people actually do as opposed to what they remember/admit they did in interviews, questionnaires and focus groups<br><br>Can capture subtle influences visitors are unaware of and identify what they didn't look at, visit, do<br><br>Can provide both quantitative and qualitative data | Subjects will change their behaviour if they are aware that they are being watched<br><br>Difficult to simultaneously observe and record data<br><br>Video data analysis is ethically very tricky and extremely time-consuming to analyse<br><br>Handwritten notes won't capture all behaviours<br><br>Staff/time intensive to collect and process the data |
| **Interviews**<br><br>Individual or paired<br><br>In person, by phone, email, video link | Interviewer can clarify what a question means<br><br>Much more likely to get thoughtful responses to open-ended questions Interviewees can be asked for further details to encourage them to expand upon their answers<br><br>Easier to get a representative sample of your audience as you are selecting who takes part<br><br>Can ensure all questions are covered<br><br>Can provide quantitative and qualitative data | Need to recruit respondents – interviews of more than 10 minutes may require incentives<br><br>Interviewees will be reluctant to give answers that reflect badly upon themselves or your organisation<br><br>Difficult to capture answers verbatim when taking handwritten notes<br><br>Staff/time intensive to collect and process the data |
| **Focus groups**<br><br>Group interview with 6 to 8 people who have 2 or more key characteristics in common<br><br>1 to 2 hours | Immensely rich source of qualitative data<br><br>Group setting encourages respondents to be more candid and thoughtful in their responses<br><br>Time available to explore issues in great detail and for respondents to reflect deeply on their opinions<br><br>Opportunity to explore different scenarios using visual stimulus materials such as storyboards, drawings, picture sorting exercises | Requires skill on the part of the moderator to keep the session on track and ensure no one person dominates the discussion<br><br>Crucial to ensure an appropriate sample is selected – may require professional recruiters and incentives, both of which are expensive. Doing the recruitment yourself will be very time-consuming<br><br>Requires a suitable venue and refreshments<br><br>Data analysis time-consuming<br><br>Only provides qualitative data |

| Method | Advantages | Disadvantages |
|---|---|---|
| **Self- completion questionnaires**<br><br>Paper, mail, online, via social media, pop-ups on websites | Inexpensive<br><br>Anonymous – potentially yielding more honest responses than in a one-to-one interview<br><br>Large sample sizes possible<br><br>Can be distributed on paper, online, email, social media<br><br>Quick and easy for people to provide answers<br><br>Can provide quantitative and qualitative data | Often get a very low response rate<br><br>Self-selecting sample that often does not represent your actual audience. People who are very supportive, very angry or otherwise highly motivated tend to be massively over represented<br><br>Clarification of questions not possible<br><br>Often get very superficial answers to open-ended questions – often just one word<br><br>Respondents often skip questions<br><br>Difficult to use with young children |
| **Data mining**<br><br>Bookings data, Google Analytics, website usage statistics, Trip Advisor comments | Inexpensive<br><br>Can provide an accurate insight into what people actually do rather than what they say they do<br><br>Can collect very large samples of data | Must be compliant with General Data Protection Regulations. Those who provide data must have opted-in; you must be clear about what data you are collecting and for what purpose; you must store this data securely, only use it for the pre-stated purpose and dispose of it as soon as possible<br><br>Wide variation in reliability of data: social media comments and rating site comments very unreliable<br><br>Unclear how representative the responses are of the general audience<br><br>Can only infer why people are acting in this way, for example why they aren't visiting a particular webpage or why they are booking a particular event |

## Bad Questions Quiz

### The answers

**Q. Do you think the media reports science accurately?**

- ❍ Yes
- ❍ No
- ❍ Don't know

**Q Is it safe for research to be funded by companies?**

- ❍ Yes
- ❍ No
- ❍ Don't know

Both of these are 'iceberg questions'. Underlying a seemingly simple question are massive assumptions about what is meant by the words: media, science, accuracy, safety, research and companies. The people who wrote these questions (probably) had a reasonably clear idea of what they meant (well maybe). But there is no way of knowing if those responding have the same meanings in mind when they answer these questions.

Always check that the meaning of the terms used in your survey or questionnaire is clear to those who will answer the questions. Even checking the questions with four or five people working down the corridor can iron out major problems before you launch your full-scale evaluation.

**Q. Do you think you/your colleagues' salary reflects the experience needed or work involved?**

- ❍ Yes
- ❍ No
- ❍ Don't know

This is an example of a double-barrelled question – where two questions have been stuck together. Think of it like this: does ticking the yes box mean:
i) my salary reflects the experience needed; ii) that my colleagues salary reflects the experience needed to do their work (and by the way which colleagues are you talking about here?); iii) or both my salary and that of my colleagues reflects the experience needed to do our jobs? It's impossible to know what is meant so the data you collect is useless.

Questions that contain the word 'and' are nearly always doubled barrelled questions unless they refer to Ant and Dec. It is always worth word checking any survey or questionnaire for 'and' to see if you've inadvertently included a double-barrelled question.

**Q. Taking all the factors into account, including the commitment to reduce noise, a willingness to cap overall flight movements, a plan to increase jobs and to increase the current operating hours, do you support the airport's proposals?**

- ❍ Yes
- ❍ No
- ❍ Don't know

Well it's not difficult to guess what answer they'd like you to provide here. This is an egregious example of a loaded question where you are signalling – intentionally or unintentionally – what answer you are hoping to get. You need to be wary of these as people will be reluctant to be critical – fearing that you will become unreasonably upset if they respond negatively to your questions. If anything, you need to encourage people to be critical as this is nearly always the most useful data to collect.

**Q. How would you rate your overall flight experience?**

- ❍ Excellent
- ❍ Very good
- ❍ Good
- ❍ Fair
- ❍ OK

What is surprising is this is a real question from a customer survey and the 'results' were quoted in a press release. OK just in case you need to know – what box would you tick if you had had a bad experience?

**Q. How often do you eat/drink at the National Portrait Gallery café?**

- ❍ Weekly
- ❍ Monthly
- ❍ Twice a year
- ❍ Annually

Even when living in London for over 20 years, the thought of eating in the National Portrait Gallery café annually is almost inconceivable, let alone weekly! What box would a tourist on a trip of a lifetime to London tick? This is a surprisingly common mistake when designing closed questions. They have failed to provide a meaningful option for respondents to choose. When you design a survey or questionnaire, you need to take a step back and ask yourself whether the question and the options make sense and will match the experience of your respondents.

## Bad Questions Quiz

### Q. Why did you visit the zoo today?

This is always a contentious one but using the word 'why' in a survey or questionnaire is a very, very bad thing. Of course, it's super important for organisations to get this information. But the key thing to remember is this is a research objective, not a question to ask respondents.

Here's the problem: people could answer this by saying: their daughter wanted to visit; or it was a lovely sunny day; or someone recommended that they visit; or they've lived in London for ages but have never visited before so were curious to see what it was like; or because their son was doing a school project about penguins; or because they saw a poster on the Underground; or because they recently bought family membership; or because they wanted to support the conservation work of the zoo; or because they visited San Diego Zoo and it was amazing; or they are on a trip to London and it was one of the key sites; or there was a special offer; or they wanted to see the tigers, or the bears, or the porcupines, or the elephants, or the giraffes or …

You get the point. There are a vast number of ways in which people could answer this question, because most people have multiple reasons for making a visit. It is incredibly unlikely that respondents will spend the time and effort working out what all these factors are, and instead just give you their first top of the mind response. This causes two massive problems for you: firstly, you will end up with a really messy data set, which is almost impossible to sort into categories.

Secondly you will only get a very partial insight into people's motivations.

'Why' is the ultimate double-barrelled question. Compressed into that little word is a host of questions that you need to ask separately. Instead of asking 'Why did you visit the zoo today?' you should ask:

*What were you hoping to see and do at the zoo?*

*Who among your party suggested visiting the zoo today?*

*Was your/their decision influenced by any of our marketing such as posters, adverts on social media, TV etc?*

*Have you visited the zoo before today's visit? {If yes} how many times have you visited in the last … ? Do you have membership or a season ticket?*

And so on … As you can see there are a lot of questions hidden under that little word 'why'. Don't use 'why' in your surveys or questionnaires.

## What might be wrong with this automated survey in an Avignon railway station?


This is a classic example of a loaded question. It's vastly easier to answer yes – press a button – than no, which requires you to download and install an app on your smartphone for reading QR codes, open the app, use it to scan the QR printed on the display in order to access a website (all of which assumes you have a decent Wi-Fi or mobile connection), and then type in a comment and submit it.

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