Evaluation:
Practical Guidelines

A guide for evaluating public engagement activities

national co-ordinating centre for public engagement

BIS Department for Business Innovation & Skills

RESEARCH COUNCILS UK

Contents

Introduction

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This guide is for researchers seeking to engage general audiences with their subject to evaluate public engagement activities, regardless of prior experience of either public engagement or evaluation. It is intended to help researchers from any discipline. For a more general guide to undertaking public engagement activities, see: http://www.vitae.ac.uk/CMS/files/upload/The_engaging_researcher_2010.pdf

Evaluation techniques are based on social and market research methods, so even though some material will be familiar to some readers, the questions posed and the thought processes suggested will be relevant to all those running and evaluating public engagement activities.

The evaluation approaches covered in this guide are suitable for a range of activities including, but by no means limited to:

- Public lectures, talks and debates (both live and on-line using new media).
- Shows.
- Festivals.
- Activities for school students and/or teachers (real or virtual).
- Websites, CD-ROMs and other virtual activities.
- Exhibitions and hands-on events, including working with museums and galleries.
- Open days.
- Activities that involve members of the public in research.

Evaluation strategies should be integral to the activity design process. If the activity involves submitting grant applications to fund it, you may find it helpful to talk to potential funders about their evaluation requirements, whilst preparing your application.

There is no magic formula for evaluation. To construct an evaluation strategy, you need to think about your objectives, the data you can collect and the reports you have to make. Done well, evaluation will improve your activity and give you a sense of achievement as you will understand more about the impact of what you have done.

1.1 Using this guide

The remainder of this guide has five main sections and a series of annexes.

Section 2
Introduces evaluation and differentiates it from monitoring.

Section 3
Looks at building an evaluation strategy. Developing your evaluation strategy as an embedded part of the activity will help you to get a better understanding of what the activity can achieve and should help you in making applications for funding. It is this stage which tends to cause the most difficulty as you reconcile your enthusiasm with resource constraints and establish realistic objectives.

Section 4
Focuses on data collection. This section describes different techniques, what they can do and how you can make them work together.

Section 5
Gives guidance on how to analyse the data you have collected.

Section 6
Looks at how to draft your report.

Annex 1
Provides some detailed advice on constructing questionnaires and phrasing questions.

Annex 2
Provides some questionnaire modules with specific questions you could use in your evaluation.

Annex 3
Provides an overview of which techniques to use depending on the information you want.

Annex 4
Is a glossary of terms.

Annex 5
Suggests some further resources on the web.

What is Evaluation? 2

2.1 Evaluation

Evaluation is said to be "very important", yet project managers tend to be frightened of evaluation because they see it as a test and a threat. Evaluation is a process that takes place before, during and after an activity. It includes looking at the quality of the content, the delivery process and the impact of the activity or programme on the audience(s) or participants.

Taking the opportunity to understand whether you achieved what you set out to, how well you did it, what impact your activity has had and to **reflect critically** on both the activities and processes will benefit you and your audiences. This knowledge can be used internally by your team to drive improvement and externally to demonstrate achievements.

2.2 Monitoring

The same basic tools for gathering and analysing data can be used for collecting both evaluation and monitoring information. As a result, there is often confusion between monitoring and evaluation.

Monitoring is about counting things and ensuring your activity is on track. Things like numbers of events, audience numbers and numbers of CD ROMs distributed, etc. are monitoring data, not evaluation data.

2.3 The different aspects of evaluation

There are three aims of evaluation:

- To support the development of your activity (formative evaluation).
- To ensure you manage it better next time (evaluation of your processes).
- To assess the final impact of your activity (summative evaluation).

2.3.1 Formative evaluation

You should use formative evaluation during the development of the activity to test ideas, concepts, venues, timings and prototypes on representatives of the audience. This will help you assess what sort of 'product and delivery channel' is going to be most effective at reaching and engaging your target audiences. You may need to test things out with a sample audience several times during your activity's development; this sort of research is a central part of an evaluation strategy.

The emphasis at this stage is likely to be on discussion-based tools (qualitative research) that will give you an in-depth understanding of your audience(s). If you are designing an exhibit or a website, watching people interacting with a prototype can provide useful input for finalising it. Qualitative input at this stage can be crucial to understanding how to change your activity to improve its appeal. To make improvements, it's no good simply knowing people didn't like it unless you know what they didn't like and understand why they didn't like it.

However, don't over-egg the pudding. You need to think about how much, if any, formative evaluation is really needed as it will add time and cost to your activity. If you are using a tried and tested formula, such as a debate format, you may not need to include formative evaluation in your activity plan. If you have any doubt about how something will be received by your audience, test it.

2.3.2 Evaluation of processes

You should evaluate the process of managing and delivering your activity. This will help you to do it better next time. This information is useful to peers and colleagues, and where possible should be shared with the wider public engagement community so that they can learn from your experiences.

For many activities, this type of evaluation can be handled entirely by the project team and is similar to conducting a research project, or you may want external help, see section 3.5. If there are a number of people involved, make sure you have scheduled into the work programme opportunities to talk through progress and any difficulties or issues that are arising. Don't forget to include this time when you are costing an activity. It will be time well spent and when presented as part of your overall evaluation strategy, will show

people making funding decisions that you know what is involved in running an activity.

2.3.3 Summative evaluation

Summative evaluation is the type of evaluation with which people are most familiar. This looks at outcomes and measures whether or not you have met your aims and had any impact on the audience. You should ask questions such as:

- How much did the audience enjoy your activity?
- Did it change people's understanding/knowledge or attitudes?
- Has it influenced their actions/behaviour?
- How big an impact did it have on those who engaged?

So the emphasis is likely to be on numerical data, but depth of understanding can be important, especially if you're interested in what people learnt or what message they took away. Qualitative data can also be crucial in explaining what lies behind your quantitative data. There is no reason why questionnaires cannot ask questions that will help you to understand 'why' people give certain responses. This is especially true if you have qualitative research, perhaps from your formative evaluation, on which to base your questions.

You need to think very carefully about the impacts you're aiming to achieve, because in order to evaluate impacts they must be measurable. You need to think about the realistic level of impact that you can make and the practicalities of identifying that impact.

Remember, summative evaluation is mainly about impacts. This means that the **counting of outputs**, such as number of people at an event, number of hits on a website, etc. is not part of your evaluation. This data is important and you should be gathering it, but strictly speaking this is **monitoring data**, not evaluation data.

2.3.4 Benchmarking and baselines

It sounds obvious, but if you're trying to change something, then you need to know the state of affairs before people interacted with your activity, so that you can see if there has been a change afterwards.

Building an Evaluation Strategy 3

This section will help you plan your evaluation and support any applications for funding.

Table 3.1 This section covers:

Sub-section	Contents
Setting aims	Being clear about the difference between aims and objectives and ensuring that each are realistic.
Setting objectives	
Choosing your evaluation tools	Identifying the data that you will need to collect, and the tools with which to collect it, to demonstrate whether you have achieved your objectives.
How much evaluation	Being clear about what you can evaluate.
In-house or independent	Can you manage the evaluation you think your activity needs and your funders want?
If you run into trouble	What to do if your activity starts to go wrong.

Building an evaluation strategy requires moving through high level aims, to objective setting, identifying indicators and measures, and selection of appropriate tools to gather data against the indicators and measures. This chapter offers some tools and ways of thinking that will support you in this process.

3.1 Setting aims

The first thing you need to do is to clarify your aim(s). What do you want to achieve? What is the purpose of your activity? This is big picture stuff. There are several reasons why people and organisations want to develop activities to communicate research to a wider audience. The Science for All[1] report published by the Department for Business, Innovation and Skills in February 2010, maps the myriad of motivations researchers have for wanting to engage with the public and summarises them as follows, to:

- win support for 'science', which includes all fields of academic research,
- make the world a better place,
- develop skills and inspire learning,
- enhance my career,
- create a more efficient, dynamic and sustainable economy,
- increase the quality and impact of my research,
- enhance social cohesion and democratic participation,
- be ethical, accountable and transparent.

The Research Councils increasingly expect some level of public engagement by the researchers they fund, see the "Concordat for Engaging the Public with Research" (http://www.rcuk.ac.uk/per/Pages/Concordat.aspx). You might want to check whether your funder has signed the Concordat.

The Research Councils view public engagement with research as a possible way of enabling, and/or demonstrating that you are considering the impact of your research, see Pathways to Impact (http://www.rcuk.ac.uk/kei/impacts/Pages/home.aspx). Other research funders may also require, encourage, or offer financial support for, public engagement work.

Your institution may be committed to public engagement and be a signatory to the National Co-ordinating Centre for Public Engagement's "Manifesto for Public Engagement". http://www.publicengagement.ac.uk/why-does-it-matter/manifesto

The Higher Education Funding Council for England is considering how to include the impact of research beyond academic impact into the Research Excellence Framework. For an up-date on how this is progressing see http://www.hefce.ac.uk/research/ref/

Whatever your driving force, having a clear aim will help you to start the process of developing both the activity and an evaluation strategy.

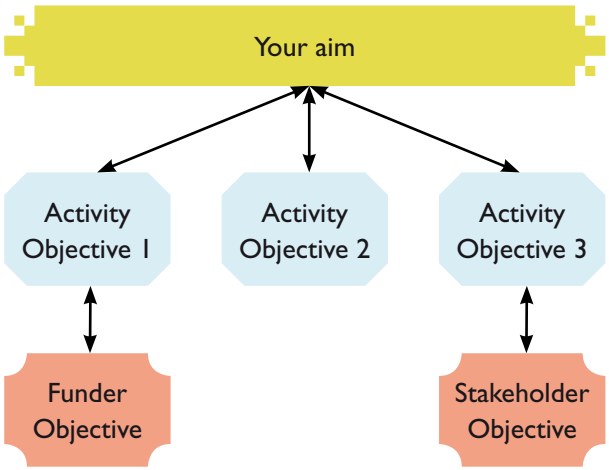
[1] The definition of 'science' used in the BIS Science and Society strategy is "deliberately wide, encompassing physical, biological, engineering, medical, natural and social disciplines, including research in the arts and humanities". http://interactive.bis.gov.uk/scienceandsociety/site/defining-science/

3.2 Setting objectives

Next you need to set objectives – these are the things you need to do to achieve your aim. Each of the motivating factors listed above will yield different types of objectives. For example, if you want to enhance democratic participation you will set different objectives from someone who wants to enhance their career (and/or that of their colleagues). An activity with the first aim will be focused on making an impact on the external audience, whilst an activity with the second aim may focus on making an impact on people within your own organisation. However, having aims that relate to changing things within your own organisation and developing the skills of you and your colleagues are valid and it is important to bear this in mind as you start to set objectives.

Setting objectives is an art. At the outset, funders (whether internal or external providers of resources) will want to see that you're going to give them value for their money. However, your activity will be evaluated against your objectives, so it is important to be realistic when setting them. Try to keep objectives simple, ideally a single key result will show whether you have succeeded. If an objective is complicated, ask yourself whether it needs to be broken down into two or more simpler objectives.

Figure 3.1 Linking your objectives to your aim and any other requirements



Good objective setting helps you think through not just the evaluation strategy, but the whole process of running the activity.

Make your objectives **SMART**:

- **S**pecific
- **M**easurable
- **A**chievable
- **R**elevant
- **T**ime-bound

SMART has become a well known acronym, but working through the list in this order may not be the best way to set about developing your objectives. When constructing evaluation frameworks, try **SRATM** instead.

The table below sets out some of the questions you need to think about when constructing **SMART** objectives using the **SRATM** order.

Table 3.2 SMART questions

Specific	What **exactly** do you want to do, **with or for whom?**
Relevant	Will achieving this objective **contribute to the delivery of your overall aim** and support your/your funders'/your institution's goals?
Achievable	Is the objective achievable? In particular **can you get it done in the time you have available**, within your budget and within the prevailing political/institutional climate?
Time-bound	When do you want to achieve this objective and/or **when do you think you will be able to achieve this objective?**
Measurable	Can you **measure** whether or not you have achieved the objective?

3.2.1 Specific

A specific objective has a much greater chance of being accomplished than a general goal. To set a specific objective you need to answer the six "W" questions below:

- **Why**: Specific reasons, purpose or benefits of accomplishing the objective.
- **Who**: Who needs to be involved?
- **Where**: Identify a location, which may be virtual.
- **What**: What are the tasks I need to accomplish?
- **Which**: Identify requirements and constraints.
- **When**: Establish a time frame.

An objective that is specific will usually have a single result, which means there will be an observable action, behaviour or achievement that can be described.

3.2.2 Relevant

To be relevant the objective must be something you can actually do that will help you to achieve your aim, taking into account the resources you have for your activity including financial, personnel and time resources. At this point re-consider whether or not the specifics you have identified are genuinely relevant to your overall aim. If they are, fine, if not go back and refine them so that they are.

So, if your aim is to "*win support for my research field*" then *all* of your objectives must help you to achieve this aim.

3.2.3 Achievable

It is no good having objectives that you can't achieve given the resources you have for your activity. Making sure your objectives are achievable makes you think about how much money you need, what skills you and your team need and how long it will take to plan and run the activity. People tend to forget about the time involved and research has shown that researchers say they grossly underestimated the time involved[2]. You may want to look for a partner who can provide financial or 'in kind' support, for example, free room hire or someone who has a skill you or your team lacks.

In considering whether each objective is achievable you should think about the barriers that stand between you and achieving your objective. This will help with contingency planning. Ask yourself: 'what if?' One barrier may be the amount of time that you have to deliver the project. A one-off engagement may have less impact than a sustained series of contacts, although one truly inspiring session is likely to have a more positive effect than a series of rather dull ones.

Most importantly, don't set yourself up to fail. Objectives should be ambitious, but they should also motivate the team and should therefore be achievable. Also, any funder will judge your capability to organise the activity by whether or not your objectives are feasible.

3.2.4 Time

For each objective there has to be a timescale for achieving it. However, just stating a date is not enough, you need to ask yourself:

- Have you left enough time to get everything done?
- Will other competing demands on your time or that of others involved, cause delay?

Addressing these questions helps to show the fundamental link between time and achievability.

3.2.5 Measurable

You need to establish how you will measure progress toward the attainment of each objective you set. You need to think about how you will know whether the objective has been, or is being, achieved. What are the indicators? Then you need to think about how you will measure each indicator. To determine if your objective is measurable, ask questions such as How much? How many? Remember though, what gets measured, gets done. So, be careful that the capacity to measure does not start to dominate at the expense of relevance. See section 3.4.

[2] *Partnership for Public Awareness – Good practice guide*, People Science & Policy Ltd, Engineering and Physical Sciences Research Council, June 2003 www.epsrc.ac.uk/funding/grants/pe/ppe/Pages/goodpractice.aspx

Once you have clear objectives, you have the means to focus your efforts, so time spent at this stage will not only help your evaluation, but also your project management, by providing a means to prioritise your resources.

3.2.6 From aim to objectives – an example

From the various aims in section 3.1 we have selected the following as a starting point:

Aim: to inspire people about my research field.

This sub-section develops some possible objectives for this aim. In developing objectives you need to think about how you will recognise that people have been inspired. This may be demonstrated by wider public appreciation that you are doing something worthwhile (or less opposition to your research) or by increased numbers of students studying your subject; it might even influence the priorities of research funders. Within this one aim you could have many activities for very different sets of people, so in developing your SMART objectives you need to think about:

- Target group(s).
- The resources you have available for the activity.
- Your timescale.
- The capacity you have for data collection within an evaluation.

You may decide that in order to achieve your aim there are intermediary steps you need to undertake, such as understanding what people currently think or undertaking simple awareness raising prior to developing support for your research. The following four objectives could all support the achievement of this aim:

- To develop an understanding of what people think about my research within the next year.
- To generate awareness of my research in the local community within the next year.
- That 75% of all participants in the activities run in the next year report that they enjoyed the activities.
- To increase the number of student participants considering a career in research at the end of the project.

The next section uses these four objectives to show how the nature of your objectives can help you to identify appropriate sources of evaluation data.

3.3 Choosing your evaluation tools

Section 4 of this guide describes different evaluation tools in some detail, but it is important to give early thought to the nature of the tools that you are likely to need. Careful setting of objectives will have given you ideas about which tools you will need to use as you have thought about how to demonstrate whether or not you achieve each of your objectives. The examples below give a range of different data sources for some indicators – **you don't have to use them all.**

3.3.1 Evaluation table

An evaluation table supports you in building on the thought processes used when you defined your objectives to identify the types of data sources, and thus the evaluation tools, that you will need to use to assess whether or not you have been able to meet your objectives. Overleaf is an evaluation table for each of the objectives set out in 3.2.6 above.

To develop an understanding of what people think about my research within the next year.

You may be interested in the views of the general public as a whole, or particular sub-sets of the public. The sub-sets may be professional or stakeholder groups as set out in the example below, but could also be groups defined by geography (where they live), socio-demographic features such as age, gender or ethnicity, or existing attitudes for example pro research, sceptical of authority etc.

Table 3.3 (a) From objectives to data sources

Objectives	Indicators	Measures	Data Sources
To develop an understanding of what people think about my research within the next year	Public perspectives	Percentage aware of my research field. Percentage understanding my field. Percentage with positive/negative views about my field.	Nationally representative survey.
		Factors underpinning the perspectives.	Group discussions.
			In-depth interviews.
	Views of specific sets of people e.g. professional group A	Percentage of group A that are aware of/understand/positive towards/negative towards my research.	Representative survey of professional group A.
		Factors underpinning the perspectives.	Group discussions.
			Interviews.
			Social media/discussion lists used by professional group A.
	Views of specific sets of people e.g. patient group B	Percentage of group B that are aware of/understand/positive towards/negative towards my research.	Representative survey of patient group B.
		Factors underpinning the perspectives.	Group discussions.
			Interviews.
			Social media/discussion lists used by patient group B.
	Views of specific sets of people e.g. history teachers	Percentage of history teachers who are aware of/understand/ positive towards/ negative towards my research.	Survey of history teachers.
		Factors underpinning the perspectives.	Group discussions.
			Interviews.
			Social media/discussion lists used by patient group B.

To generate awareness of my research in the local community within the next year.

Building awareness does not necessarily mean 'inspiring'. Sometimes the more you know about something (or even someone), the less you like it (them). However, you cannot inspire anyone if they are not aware of your research.

Table 3.3 (b) From objectives to data sources

Objectives	Indicators	Measures	Data Sources
To generate awareness of my research in local community within the next year	Awareness of research	Percentage of people, within the local community, aware of your research.	Representative survey of local community.
		Percentage increase in people, within the local community, who are aware of your research.	Representative surveys of local community (time series).
	Awareness of research processes	Percentage of people, within the local community, who understand your research objectives and processes.	Representative survey of local community.
		Percentage increase in people, within the local community, who understand your research objectives and processes.	Representative surveys of local community (time series).
	Role of your activity in generating awareness	People, within the local community, became aware of your research through direct interaction with your activity.	Survey of local community.
			Group discussions.
			Social media.
		People, within the local community, became aware of your research through wider dissemination of your activity.	Survey of local community.
			Group discussions.
			Social media.

As the above table shows, if you simply want to know whether there is any awareness and whether your activities have contributed to this awareness, you can use either qualitative or quantitative techniques. If however, you want to know how much awareness there is you need representative quantitative data and if you want to know about changes over time you need repeated collections of quantitative data.

75% of all participants in the activities run in the next year report that they enjoyed the activities.

Enjoyment of activities can be very important. If you (and your colleagues) have invested time and quite possibly additional money in an activity and the audience/participants have given up their time to take part, ensuring that all these contributors enjoy the activity is no bad thing. In addition to the fairly obvious fact that enjoyment is likely to lead to further participation (and don't forget that this applies as much to you and your colleagues as to anyone else) enjoyment also acts to drive other impacts. Evaluations have been undertaken where enjoyment (or the lack of it) strongly correlated with the development of more positive (or negative) attitudes and enjoyment has been linked to the degree to which knowledge is acquired, as well as the degree to which attitudes are influenced[3].

You may need to think about how 'enjoyment' might manifest itself and ask about that as well as a direct question about level of enjoyment. For example, enjoyment might be manifested as a desire to repeat the experience or to recommend the activity to a friend.

Table 3.3 (c) From objectives to data sources

Objectives	Indicators	Measures	Data Sources
That 75% of all participants in the activities run in the next year report that they enjoyed the activities.	Views of "lay" participants	Proportion of lay participants reporting enjoyment.	Representative survey of participants.
		Number and nature of factors affecting enjoyment.	Observation.
			Focus groups.
			Interviews.
	Views of "expert" or stakeholder participants	Proportion of expert or stakeholder participants reporting enjoyment.	Representative survey of participants.
		Number and nature of factors affecting enjoyment.	Observation.
			Focus groups.
			Interviews.
	Views of your team	Proportion of your team who enjoyed taking part.	Representative survey of participants.
		Number and nature of factors affecting enjoyment.	Observation.
			Focus groups.
			Interviews.

You can measure performance against this objective only by using quantitative data. However, you may also wish to find out why people did or did not enjoy your activities so that you can improve this aspect of your performance. This can be covered in surveys, but you could also use observational or qualitative tools to build a deeper understanding. This is the sort of area where you can make your evaluation work on two levels, both formative and summative.

[3] http://www.epsrc.ac.uk/SiteCollectionDocuments/Publications/reports/EaBVreport.pdf http://www.ytouring.org.uk/productions/archive/mtg2005/evaluation.html

To increase the number of student participants considering a career in research at the end of the project. This could be either across the general population or amongst specific groups.

An activity with a specific objective associated with recruitment would need to have the scope to track participating young people over time in order to assess whether or not this objective is achieved. This implies a long-term commitment to the evaluation (and quite possibly to the activity as well). If you are setting an objective of this type, you need to be sure that it is practical to assess whether or not you have achieved it, as well as whether it is achievable in its own right. Often the practical option is to use intention to study or the choices that students make earlier in their studies as shorter-term proxy indicators, as in this example.

Table 3.3 (d) From objectives to data sources

Objectives	Indicators	Measures	Data Sources
To increase the number of student participants considering a career in research at the end of the project.	Intentions	Number of students stating intentions to study relevant subjects.	Baseline surveys of participants.
			Follow-up surveys of participants.
		Factors affecting choices at age 14 and 16.	Focus groups.
	Choices	Number of students choosing to study relevant subjects at age 14.	Baseline surveys of participants.
			Follow-up surveys of participants.
			Management data from schools.
		Number of students choosing to study relevant subjects at age 16.	Baseline surveys of participants.
			Follow-up surveys of participants.
			Management data from schools.
		Factors affecting choices at age 14 and 16.	Focus groups.

3.3.2 Mind mapping

Some researchers will be more comfortable with a more fluid approach. Taking a mind-mapping approach to setting objectives, identifying indicators and measures and working out the tools you need to use to collect the relevant information may be more appropriate for you.

Figure 3.2 From objectives to data sources

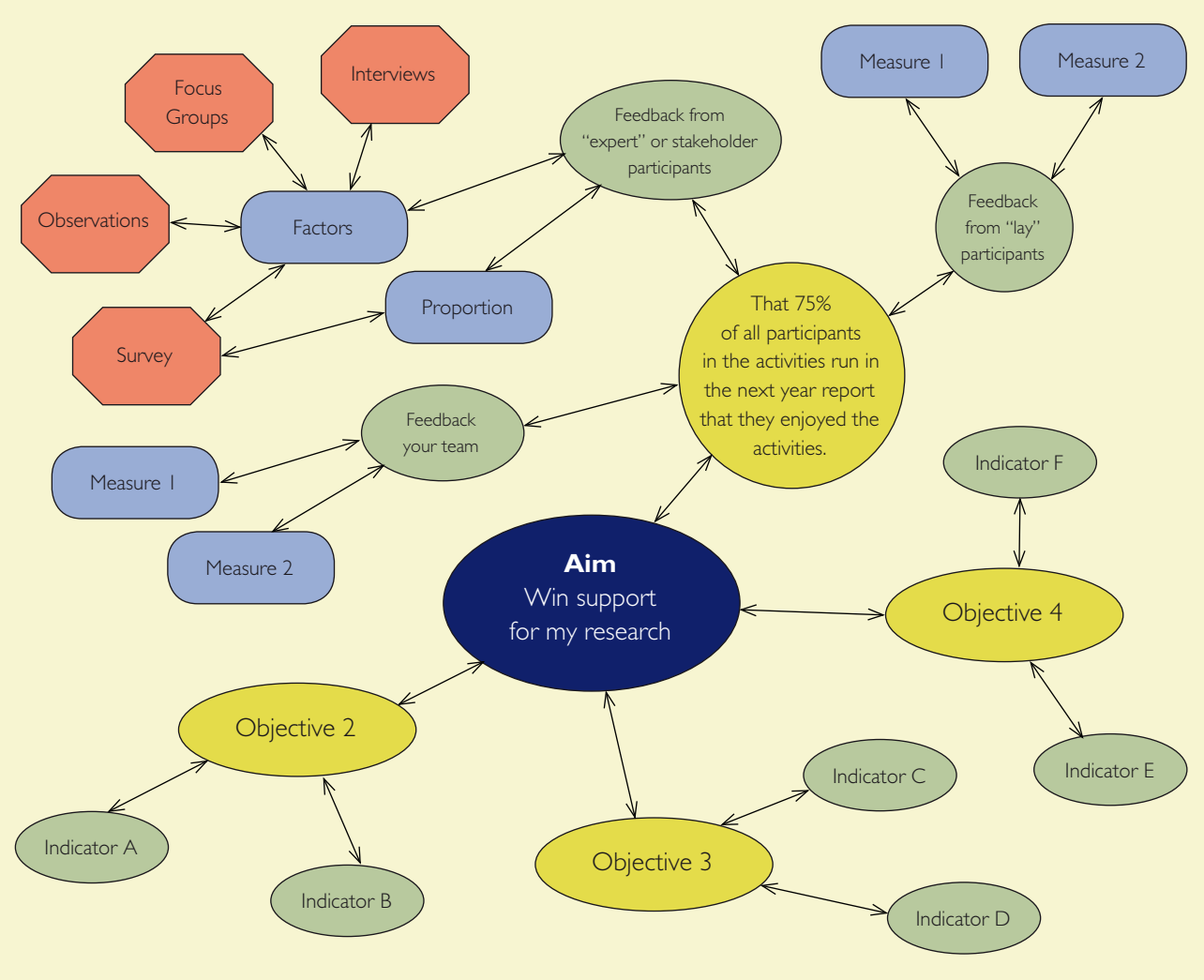


Figure 3.2 provides a similar output to table 3.3(c), but the difference is the process of developing the output. Table 3.3(c) was developed using a directional causal chain, whereas in developing the mind map, the links are more likely to be put in place after the various components have been identified.

3.4 How much evaluation?

The resources available will determine what sort of evaluation you can do. Generally evaluation is one line within an overall activity budget, each component of which you are likely to be under pressure to reduce.

Evaluation is not always seen as contributing directly to the activity and can therefore be regarded as a lower priority. To defend its place, there have been calls to set a specific portion of budgets aside for evaluation, 10% of the activity budget is often quoted. This is rarely sensible. In the case of small activities this would mean that you can do almost nothing, yet for much larger activities a smaller fraction may provide ample resources.

Rather than set an arbitrary proportion of the budget, it is much better to think about what information you need, how it can be collected and analysed and then to **consider whether the effort and cost of this work is proportionate to the activity**. If it is not, are you being either too ambitious or not ambitious enough with your evaluation?

Also, familiarity is a factor. If this is the first time you, or indeed anyone, has done something it might be worth investing more in good evaluation so that you can improve your activity in the future, and therefore run smaller evaluations. Equally, if you are running a fairly standard activity there may be no need to evaluate it at all, especially if the budget is limited.

Don't be afraid to speak up if it is not possible or practical to evaluate some or all of your activities. However, you shouldn't use this argument to avoid undertaking work that is easily achievable and that will, if done properly, provide you and your stakeholders with much useful information.

3.5 In-house or independent?

A frequently asked question is 'Do I need an independent evaluation?' Maybe - there are pros and cons to both options. Some people believe that if evaluation is a tool by which to improve, then there are clear benefits to self-evaluation. The feedback is direct and you will have a real depth of understanding of your audience, although you may have to recognise that there are limitations to the data gathering and analysis skills to which you have access. You may need to bring in an outsider with specialist skills if you want to answer more difficult questions about impact. They might be from another department within your institution or an external organisation.

On the other hand, some people believe that if you evaluate your own activity you will cheat to make it look good, maybe even without realising it. Also, you should consider whether people might give you more favourable answers because they don't want to hurt your feelings or because they believe that there may be a negative impact on them if they are critical.

If it is crucial that the evaluation is seen to be unbiased, then an independent evaluation may be the only option. Indeed, funders may well stipulate that an independent evaluation is required, perhaps because of the large sums of money involved or because they are trying to compare the merits of different approaches. This is where having clear objectives will really help. If you haven't got any, external evaluators will try to set them for you and bring their own value judgements to bear.

The need for confidentiality may also influence your choice of internal or external evaluation.

If you feel you are ill-equipped to undertake your own evaluation, you may look to people within your own institution. If you have a public engagement or outreach office, they should be able help with your evaluation. Otherwise, you might consider approaching someone in your research office or colleagues with expertise in social research methods or data collection tools. However, if you're not a social scientist, you should note that not all social scientists are familiar with evaluation or the data collection tools used in evaluation.

3.6 If you run into trouble

Some funders were interviewed during production of the first edition of this guide. In general funders want the activities they're supporting to be successful. If you're not reaching your objectives, but your on-going evaluation means that you know why, and the evaluation enables you to set out a plan that will help

you get back on track, most funders will give you a sympathetic hearing. You might want to revise the objectives. The earlier in the activity you tell funders what is happening, the more sympathetic they're likely to be. Remember, in most cases the funder's programme manager is there to help you.

When setting objectives the SMART criteria will drive you to be specific, but if this is your first experience you may not know what represents an attainable and realistic target. You will have to use your judgement and make sure that your formative and process evaluations give you data to explain why you are over or under-achieving, and in the case of the latter what you can do about it. As evaluation databanks[4] grow, funders may be able to provide advice that will give benchmarks. In the future your data will help others with this conundrum.

[4] See for example http://www.britishscienceassociation.org/forms/scicomm/evaluation/access/

Gathering Data
Tools and Techniques

4

4.1 Introduction

Working through the process of developing SMART objectives should have started the process of thinking about data collection tools. The basic tools and techniques are based in social and market research methods. Those who work in these fields use certain terms with a common understanding of what they mean. This language is explained in this section and in annex 4.

This section focuses on the tools that researchers might use to support in-house evaluations, rather than the more complex, and expensive, options that might be used by an external contractor.

If you are commissioning others to do your evaluation, you should focus on the intelligence that you require (the objectives of the evaluation) rather than trying to specify the nitty-gritty of tools. However, you will be a better customer if you understand the strengths and limitations of different techniques and understand the language being used by your sub-contractors.

Broadly speaking there are two main types of data, quantitative and qualitative. For both types of data there are ways of gathering data that will ensure they are reliable.

4.2 Quantitative research

Quantitative research is best suited to answering questions about **how many** people did or thought something. You can also ask them how much, to what extent and other 'measure' type questions.

There are two underlying principles to quantitative research:

- every respondent should be asked the same questions in the same way, so that the answers can be added together; and
- the information you collect is representative of all the people that took part in, or used, your activity.

The questions can be asked by an interviewer face-to-face or over the telephone, or people can complete a questionnaire themselves either on paper or via the Internet. Whatever the method, the questions are highly structured to ensure consistency. You can use this structured questionnaire format to collect factual and attitudinal data and to explore the reasons behind people's initial answers. Often people can do the same thing, but for different reasons and being able to compare those with different rationales can be important in making decisions on how to improve an activity.

4.2.1 Quantitative sampling

Strictly speaking, when drawing a sample to be representative of your 'users' everyone you reach by your activity should have an equal chance of being asked to respond, although there is a cost-quality trade-off and some sampling methods are better at this than others. Sampling is about avoiding bias and only getting responses from certain types of people or people who liked your activity. **It is important to note that just having a lot of respondents is not good enough if they are not representative of your audience**.

The types of sampling techniques you'll most likely use to collect quantitative data that are representative of your users are:

Census – collecting information from everyone who engaged with the activity.

Systematic sampling – taking every 'nth' person who passes a particular spot or accesses a website, requests a pack etc.

Quota sampling – if you know that 50% of your audience will be girls (perhaps a school has told you) then you set a quota of 50% of your sample to be girls. Which girls you ask should then be 'random', so that you have no reason to believe that those you interview are in any way different from those you do not.

You can also use very simple methods to select a sample, like those born on a certain date in the month. For example, taking everyone born on the fifth, fifteenth and twenty-fifth of every month of the year has been found to consistently yield a 10% sample.

Sampling methods are all very well, but you will find that not everyone you ask to take part will do so. The main issue will be that those who enjoyed your activity will be more likely to respond than those who did not. **This is why getting a high response rate is important**. The higher the proportion of those you select for interview who respond, the more confident you can be that your results are representative of your audience. Using interviewers means you can get a more representative sample than relying on self-completion as there is a bit of pressure on people to take part because they won't (generally) want to be rude. However, if you can't be sure that those who didn't respond are no different from those who did, make sure you include the limitations of your data in your report. Also, you need to ask at least 100 people before you can start stating percentages, even if you ask everyone who took part.

Sampling and the Internet

With the advent of easy to use and free/cheap Internet survey tools, such as Surveymonkey, Zoomerang and Survey Gizmo you can design your own survey and circulate the link to the questionnaire by e-mail.

However, simply being able to run a survey does not mean that the data collected will be representative of any particular group or audience. Many people think that circulating the link to everyone they know, or can reach via e-mail lists, will provide a large number of responses that can be reported on quantitatively. However, this is not the case.

If the people reached by a survey are not systematically selected to be representative of a particular audience and are likely to have particular views because, for example, they all belong to the same e-mail list, all you have undertaken is a very large qualitative research project; even if you have a very high number of responses.

An obvious analogy would be a survey run by a newspaper through its website. No-one would suggest that the findings represent the views of the population as a whole; indeed they may not even represent the views of the newspaper readership as a whole.

4.2.2 Quantitative data collection techniques

Having constructed your sample, or decided on a census approach, you need to think about which data collection technique to use. There are four basic quantitative data collection techniques, each of which has strengths and weaknesses. The four options are:

- Face-to-face interviews.
- Telephone interviews.
- Self-completion on paper.
- Self-completion on-line (e-mail or Internet).

For small, live events, the most likely method will be self-completion on paper, where questionnaires are distributed and attendees are encouraged to complete and return them at the end of the event or post them back later. For some activities, face-to-face interviews with a sample of attendees is another option. These are tools for gathering instant feedback.

You may want a considered response, or to gauge responses after participants have had time to reflect on their experience or take some actions. In this case sending out self-completion questionnaires by post or e-mail or getting an interviewer to contact people by telephone or to visit people, are all possible options. The table below sets out basic strengths and weaknesses of the different options.

Survey style	Strengths	Weaknesses
Face to Face	You know the right people have responded. You can be more confident that interviewees have understood the question. You can repeat questions that interviewees have not understood. Interviewers with different language skills can access different communities. High quality data.	Resource intensive so most expensive. The person doing the interview can inadvertently bias the response. See annex 1, section on avoiding bias.
Telephone	You can repeat questions that interviewees have not understood. You have a good chance of making sure the right people have responded. Interviewers with different language skills can access different communities. Moderately high quality data.	Quite resource intensive so expensive, but cheaper than face-to-face. You need telephone numbers for your sample.
Self-completion on paper	Relatively cheap to undertake (but remember printing and postal costs if applicable). You can use longer questionnaires but you will get a better response if they are short. Translation can help you to access communities whose first language is not English. Moderate quality data.	You cannot be confident that interviewees have understood the question. People can look ahead at the questions, which might bias their answers to some questions. You cannot be sure that the right people have responded.
On-line	If you have a defined sample and e-mail addresses, you have a good chance of making sure the right people have responded. Pop-ups work on asking every n^{th} person who visits the website to complete a questionnaire. You can use additional material such as pictures to help people respond. Relatively cheap to undertake. Moderate/high quality data.	You cannot be confident that interviewees have understood the question. Depending on how you set-up the questionnaire people may be able to look ahead at the questions, which might bias their answers to some questions. If you do not have a defined sample, you do not have quantitative data. You cannot be sure that the right people have responded. Only respondents with Internet access can take part.

It's a good idea to think about doing exit surveys as people leave events or follow-up surveys by telephone, post or e-mail – depending on what information you have about people. If you've developed a website you can implant what are called 'pop-up' questionnaires to collect data from every 'nth' visitor or collect e-mail addresses to send a questionnaire later.

Experience shows that e-mails sent to specific individuals yield higher response rates than pop-up questionnaires and as section 4.1.1 emphasises, a lower response rate reduces the confidence that you have collected data that represents the views of the whole population in which you are interested.

4.2.3 Constructing a questionnaire

There are many factors to consider when designing a questionnaire. The first is 'what do you actually want to know?' which takes you back to the objectives of your activity. Do not waste your time and those of the people responding by asking questions simply because you can, every question should justify its inclusion.

Once you have identified the information you need, the length, structure and layout (for self-completion questionnaires) will impact on the response rate, which you want to maximise. Remember that the questions you ask will influence people's answers to later questions, so you need to think about the order in which you ask questions.

Questions can be 'pre-coded' where the respondent selects an answer from a list or 'open-ended' where respondents can write in their own comments. Some pre-coded questions include an 'other, specify' category where those who have not found a pre-code to tick can write-in their views. Remember, if you use open-ended questions, someone will have to read all the responses.

Annex 1 looks at the factors to consider and questioning techniques, such as attitude statements and scales, that will give you appropriate data. Although Annex 1 is written for self-completion paper questionnaires, the same basic principles apply for all data collection methods. Annex 2 gives you example questions and questionnaire modules.

It is always a good idea to pilot a questionnaire on the target audience. Ideally this piloting should include conversations about the respondent's understanding of the meaning of both the questions and the available responses, so that you are sure that the questions are eliciting the information you want. You can use friends, family or colleagues for this to keep costs down, if they are a reasonable approximation of a member of the target audience and not as immersed in the activity as you.

4.3 Qualitative research

Qualitative methods enable you to address the deeper questions, such as **why** people did or did not like an activity, why they felt it was good or bad, and what you could change to make it better. The numbers offered by quantitative techniques can offer a seductive promise of certainty, but there are many instances where the depth of insight from qualitative work will offer the best value for money. This is particularly true for formative evaluation.

Social and market researchers use the term 'qualitative research' to refer to individual, one-to-one in-depth interviews and group discussions/focus groups conducted by someone who has been involved in the whole process of the evaluation and who therefore has a deep understanding of the objectives of the activity. This is likely to be either you or one of your team and because qualitative methods allow you to interact directly with 'users' you can test out ideas that you form during the evaluation process.

Technique	Strengths	Weaknesses
In-depth interviews	Useful for talking to those with busy diaries. Good for situations where replies may be sensitive, where people might be reluctant to say things in front of others. Ideal when you want to collect details that are likely to be very individual, such as histories of individual involvement in an activity. Can be face-to-face or by telephone.	Relatively expensive as you only involve one person at a time. Stimulus only comes from the interviewer, so there may be little challenge to views and limited capacity to provoke reflection.
Group discussions or focus groups	Interaction between participants can stimulate ideas. Good for formative evaluation as this type of research can give you quick feedback on how potential audiences view your emerging ideas. Flexible - You might put similar people together to encourage them to explore the issues in depth from similar perspectives. Alternatively, you might create mixed groups to give people exposure to different viewpoints. Can be face-to-face or on-line.	Not good for situations where you might want to explore personal experiences. Audio or video recording is required if you want to do detailed analysis after the fact (you need to get signed permission from participants for audio and video recording). Strong personalities can dominate so you need a skilled facilitator. Men can dominate mixed-gender discussions, so you should think carefully about separating men from women in discussion groups. Younger adults tend to speak less when grouped with older people so you should think carefully about age mixes.

Both in-depth interviews and group discussions can be one-off events or re-convened to allow the interviewees/participants to offer further views after time for reflection.

4.3.1 Qualitative sampling

Qualitative research is about depth of understanding, so samples tend to be small. You will find that you don't need to talk to large numbers of people before you stop getting new information. People tend to be selected to give you a cross-section of your audience rather than a representative sample. Rather than using the structured approaches to select people that you need for quantitative surveys, you pick individuals who meet your criteria for inclusion. If possible, try not to include people who know each other. Their views may be similar and there may be specific dynamics within their relationships that affect those of the group more widely.

The small size of your sample and the way it has been selected means that the results are not statistically representative of the group your participants 'represent'. Not only might you have missed some marginal views, because your sample is small, you have no idea how prevalent their views are in the wider population because of the way in which they have been selected. For your findings to be statistically representative you need to use one of the methods described in the section on quantitative methods.

To ensure that you include the right sorts of people, you should think about the main variables or

characteristics that you think will be important, given your activity. For example, are men and women likely to respond differently? Are younger people likely to be different from older people? Are those in urban areas likely to be different from those in rural areas? If the answer to these types of questions is yes, then you need to make sure you include men and women, younger and older people and urban and rural dwellers in your sample. And although more people in Britain live in urban areas than live in rural areas, you might include the same number of each group in your research. However, you don't need to cover every segment you identify explicitly – so you don't need older men in rural areas, older women in rural areas, and so on. You could just have older men in rural areas and younger women in rural areas with younger men in urban areas and older women in urban areas. Running focus groups can be expensive, especially if you use an outside contractor, so you may need to prioritise which groups to include.

An option that is becoming increasingly available is on-line discussions either using video/audio streams or textual conversations. For these discussions to be classed as qualitative research you must apply the same depth of rigour to selection of the participants and coverage of all salient points as you would for face-to-face work. Less structured approaches using new media, and particularly social networking tools are discussed in section 4.4.

4.3.2 Anecdote

Qualitative research is not anecdotal. The sample and the discussion are structured by researchers against clear objectives for the evaluation.

However, given the budgets that are sometimes available for engagement activities, you should think of conversations in the margins of an event as providing useful feedback. While any feedback is better than none, you need to be careful about how you interpret such ad-hoc comments. For example, the one participant who made a comment may be atypical and have sought you out simply to make their point. It is useful to know what such an individual thinks as there may be others who feel the same, but equally any single individual may have their own agenda.

Thinking of anecdotal evidence as a source of ideas to be investigated more thoroughly using more rigorous techniques is a helpful way of attaching the right weight to this sort of feedback.

4.4 Other options

4.4.1 Observational research

Observation involves the planned watching, recording, and analysis of behaviour as it occurs in a 'natural' setting. In most cases you will be observing people interacting with your activity. It is particularly useful for understanding how people use websites or flow through an exhibition, as well as to explore how to get more people to actively engage with talks and discussions.

Observation enables evaluators to:

- understand individuals' engagement with specific tasks and processes,
- understand individuals' attitudes and relationships in context,
- define key issues that may be followed-up in interviews and surveys,
- form relationships with the participants, which will help with any follow-up interviewing, and
- it eliminates the bias of self-reporting that may occur in interviews and surveys.

You can observe and make notes on how individuals interact with your activity, but you can also use observational methods to compare group dynamics across events. This is done by having a structure against which you can record details you are interested in, for example: the order in which web pages are accessed, the number and type of participants at an event, level of input to discussions, types of people who actively participate, main subjects of concern and so on.

The reducing price, and increasing quality, of digital photography and video make visual recordings a viable option, but remember that you should seek the signed consent of participants to any recording and parental consent for recordings of young people.

Sampling

Observational research is mainly qualitative when conducted as part of formative evaluation, see 4.3.1 for guidance on sampling.

When observing final activities such as exhibitions, you need to think about times of day and days of week, as different people are likely to engage at different times and you need to ensure that your sample is as representative as possible of all those who engage with your activity.

4.4.2 Visitors' book

A visitors' book (or similar tool such as a "Post It" board) is a good way of capturing the thoughts of visitors and getting feedback. However, only those who are highly motivated will give comments. So the comments, while helpful in the development of your project and similar, future projects, will not be representative of your achieved audience, or your initial target audience.

4.4.3 Social media

Social media refers to web-based and mobile technologies that enable interaction between users. There are literally hundreds of social media tools. Among the best known are Facebook and Twitter, which are illustrative of the different types of tools.

These tools all enable you to interact with the people who engage with your activity. They also allow the 'users' to interact with each other. However, feedback through social media is best seen as anecdotal evidence, because only those who are very motivated are likely to take part. You should regard the issues that arise through these discussions as topics to be explored with more systematic qualitative or quantitative techniques rather than definitive evidence.

The Research Information Network has produced a useful guide for social researchers that documents the different types of social media and how they can be used in social research and much of this carries over to evaluation. See: http://www.rin.ac.uk/our-work/communicating-and-disseminating-research/social-media-guide-researchers

4.4.4 Record keeping – management data

Record keeping can stimulate self-reflection and might be thought of as self-observation. At its simplest you could keep a diary, which records your thoughts and feelings throughout the process as well as your reflections on the process itself. This forms a record of what happened and when, and is a useful resource when looking at how you could do things better in the future. You could also ask users of your activity to keep records of their interactions and their thoughts over a period of time. The widespread availability of digital photography means that keeping pictorial records is an option that is readily available.

4.4.5 Media impact

If you want to raise awareness you might set an objective about press or media coverage. Measuring the impact of this can be very difficult. Some people measure column inches and use the sales or readership figures of the publication to estimate the numbers reached. However, not everyone reads every page of a newspaper or magazine and the impact on readers is generally unknown.

When it comes to television and radio programmes, viewing and listening figures may be available. Nevertheless, even in television, where there is a considerable amount of programme research, data on impact rather than enjoyment, is unlikely to be available.

4.5 Confidentiality

Market and social research operates from the premise that information given by respondents in research projects is confidential. Questionnaires usually reassure people that they will not receive marketing information or sales calls as a result of taking part and that no one

will know what they personally have said, other than the people processing the data.

People may be happy to put their name to their views and responding to an evaluation of a public engagement activity is unlikely to cause problems for respondents. Nevertheless, there may be cases where people feel that you will pass on their views to others and that this may be detrimental to them in some way. Offering confidentiality doesn't usually cause problems in reporting and can be beneficial, but it may mean you can't conduct the evaluation in-house. Some people may be more forthcoming to someone unrelated to the activity – another case for an independent evaluator.

You should also note that asking people their views in front of others may restrict what they are prepared to say, depending on the topic.

You also need to be aware of the Data Protection Act see: www.informationcommissioner.gov.uk

Data Handling
Tools and Techniques

5

The previous section looked at the various methods for collecting data. This chapter looks at how you analyse it. Here it is assumed that data collection and analysis is being handled in-house rather than through specialist sub-contractors. If you are using sub-contractors, but they are not providing you with a final report, then you will need to specify the analysis you want and the format in which you want the data.

5.1 Quantitative data

5.1.1 Coding

The first thing to do with your questionnaires is to code any questions where respondents have entered their own answers rather than ticking a box. Read through each question one at a time, that is, look at all the responses to Q1 together, all those to Q2 together and so on. You should be looking for similar responses so that you can draw-up a 'code frame' for the question. This allows you to add together similar responses from different people. Once you have your code frame you will give each code a number. Then you need to read each questionnaire and put the appropriate code or codes (people may have said more than one thing) by the side of the question. It is this number that you will enter into your dataset, not the verbatim comments, these should be kept separately.

5.1.2 Data entry

If you are using paper questionnaires you will have to input your data. Data entry is a time consuming and relatively specialist task. You have to make very sure you don't make mistakes. For small amounts of data you might do it in-house, for larger amounts consider using a specialist data entry firm, the speed and quality of entry is likely to yield dividends and the cost is only going to be a few hundred pounds for the size of job you're likely to have. A strength of on-line surveys is that the data is automatically collated. Similarly if you have commissioned data collection it will be provided in the electronic format that you specify.

5.1.3 Analysis

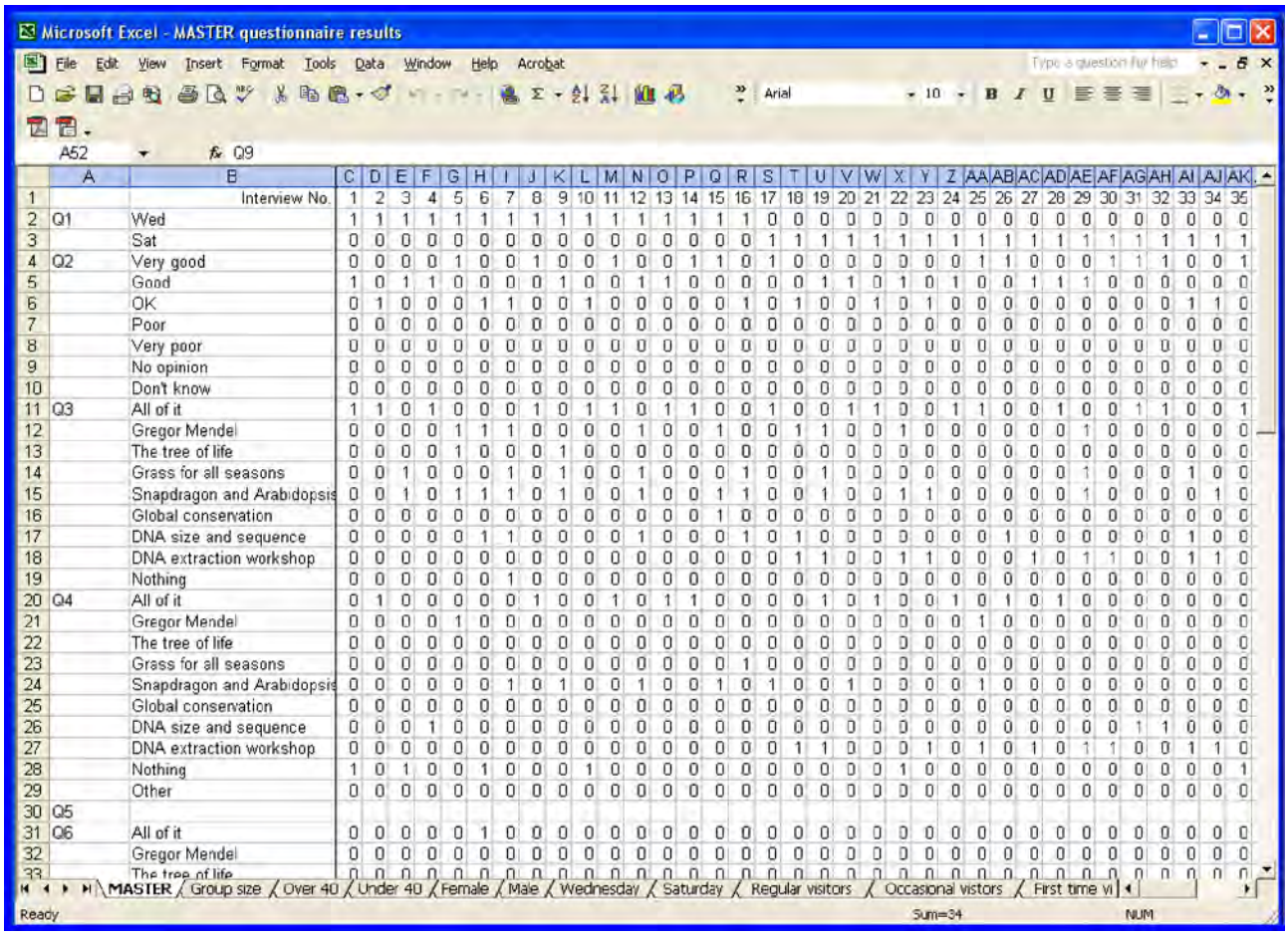
If you only have a small number of respondents, perhaps fewer than 50, you could do your analysis by hand by just counting through the questionnaires. However, if you want to do any analysis beyond total counts of how many people gave each answer, or you have more respondents, then the simplest way to analyse small datasets is to use spreadsheets. It really is worth the time to enter the data.

Figure 5.1 overleaf shows an example spreadsheet with raw data entered. Each column represents a single respondent and each row a question. Each cell represents the answer to a question. So, for example, for Q1 the possible answers are Wed and Sat. '1' indicates the answer is "yes" and '0' that it is "no". So the person whose answers are entered in column 'C' said 'yes' to 'Wed' and 'no' to 'Sat'. It may seem, and indeed is, time consuming to break data down to binary components, but this is vital if you want to be able to do more sophisticated analysis of your data than simple counts of the whole population.

Summing across the rows gives you the total number of responses for that answer across the sample. However, you're quite likely to want to analyse the data against key variables, such as age or gender. These variables are often known as cross-breaks and if you are commissioning data collection and preparation you will be asked to specify the cross-breaks that you would like to have included in the dataset that is prepared.

It is fairly straightforward to set up simple cross-breaks in a spreadsheet package using the SUMIF function. This logical function allows you to sum the responses in one row (or column) where the responses in another column match a particular criterion. So, in the example above the function could be set to sum row 4 (very good) for all the cases where row 3 equals 1 i.e. people who attended on Saturday. If people who attended on Saturday are more likely than those who attended on Wednesday to have thought that the event was very good, then you have an important finding.

Figure 5.1 Raw Data



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1		Interview No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
2	Q1	Wed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3		Sat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	Q2	Very good	0	0	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	0	1
5		Good	1	0	1	1	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	1	0	1	0	1	0	0	1	1	1	0	0	0	0	0	0
6		OK	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0
7		Poor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8		Very poor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9		No opinion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10		Don't know	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Q3	All of it	1	1	0	1	0	0	0	1	0	1	1	0	1	1	0	0	1	0	0	1	1	0	0	1	1	0	0	1	0	0	1	1	0	0	1
12		Gregor Mendel	0	0	0	0	1	1	1	0	0	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
13		The tree of life	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14		Grass for all seasons	0	0	1	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
15		Snapdragon and Arabidopsis	0	0	1	0	1	1	1	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	0
16		Global conservation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17		DNA size and sequence	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
18		DNA extraction workshop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	1	0	1	1	0	0	1	1
19		Nothing	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Q4	All of it	0	1	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	1	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0
21		Gregor Mendel	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
22		The tree of life	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23		Grass for all seasons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24		Snapdragon and Arabidopsis	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
25		Global conservation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26		DNA size and sequence	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
27		DNA extraction workshop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	1	0	1	1	0	0	1	1	0
28		Nothing	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
29		Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Q5																																				
31	Q6	All of it	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32		Gregor Mendel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33		The tree of life	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The capacity that spreadsheets offer is straightforward, but important analysis shows why it is vital to break data down into the binary data. This simple formula would not work if you have two single rows for questions 1 and 2 with Saturday or Wednesday entered in the first row and V Good, Good, OK, Poor, V Poor, No opinion or DK in the second. As soon as a dataset becomes large enough that you might want to interrogate sub-samples the need for proper data preparation becomes paramount.

For large datasets and complex surveys it is better to use bespoke packages for data analysis. The industry standard is SPSS (Statistical Package for the Social Sciences), which offers far greater processing power than spreadsheets and access to a wider range of statistical tests and methods.

5.2 Qualitative data

Qualitative data is gathered by recording the discussions. Recording may be literal through audio or video (in either case permission should be sought from the respondents before recording starts) or via note-taking to record key points. Bear in mind that if you choose to take notes rather than tape record, you will loose some of the richness of the data and you will never be able to recapture it. Most social and market researchers record focus groups and one-to-one interviews so they can concentrate on responding to, and observing, the interviewee(s).

You can use flip charts in a group situation and this allows participants to confirm that you have accurately recorded what they meant. This approach also means that some analysis is being undertaken in situ as key points are identified and recorded by the group supported to a greater or lesser extent by the facilitator.

Analysis of recorded conversations can be undertaken by making transcripts or by listening back to the tapes, making notes and recording quotes.

What to look for:

- Main and sub-themes and issues (across different groups/individuals) that emerge from the discussion.
- Ideas from participants that will support the development of your activity.
- Tracking individual views through the discussion, exploring how and why views change (if they do) and any preconceived or hyperbolic views.
- The context, and thus the interpretation, of comments.
- Illustrative quotes for use in reports.
- The language used – this will help with the design of quantitative questionnaires.

It is unlikely that you will be using qualitative data to prove or disprove a hypothesis, rather you will look at data to see what issues emerge from them. So the approach is not "*Was the event boring because the speaker was no good?*" rather it is "*How enjoyable was the event*?", "*Why was it enjoyable/not enjoyable?*"

In essence, interview data can be treated in two ways. Some people take comments at face value and categorise the text into themes. It is important to remember though, that qualitative research is about more than just what people say. People do not always express themselves clearly, may contradict themselves and their body language will add to your understanding of what they mean. Your understanding of what they mean is important, but you need to recognise that it is *your understanding*.

One of the simplest ways to analyse qualitative data, that allows you to incorporate the context of the discussion, is 'charting'. Listening back to the tapes or working through transcripts, you identify the main issues or themes raised in the discussions. You plot who made each (relevant) comment, leading you to be able to identify the type of person who raised each issue and therefore for whom this was an important point. However, as you work through each discussion charting it, you take into account context and intended meaning as well as the pure text.

There are specialist software packages to support the analysis of qualitative data these include NVivo, ATLAS.ti and Framework amongst others. Such packages allow qualitative data from different sources to be linked together in a single work unit, so that electronic annotations can be used to link themes, data and issues across the different sources, which can include notes and transcripts of discussions, pictures, audio and video files. Importantly, using these tools does not replace the in-depth reading of transcripts/notes. It only provides an electronic means of cataloguing and linking sources to simplify the process of drawing together evidence from different interviews or sources.

5.3 Observational data

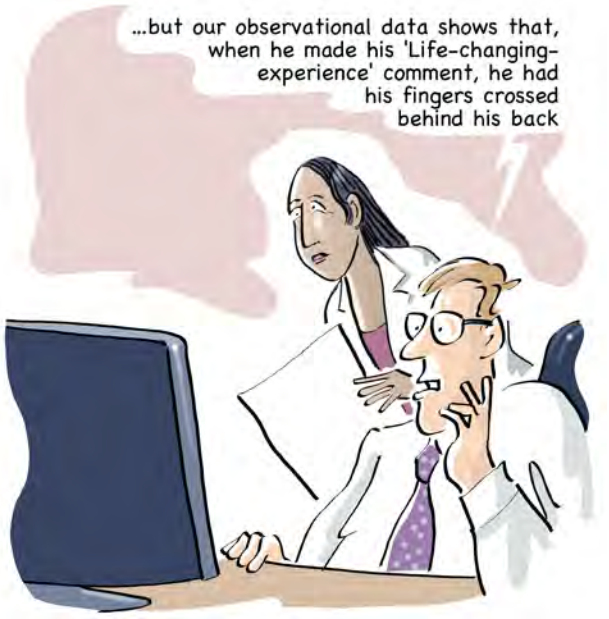
Observational data provides contextual information against which to understand the results that emerge from surveys and focus groups as well as providing data on how people engage with your exhibition or website.

Social researchers are aware that what people do is not what necessarily what they say they do, and observational data, taken with other information, can highlight these inconsistencies. For example, a facilitator's observations of group members' behaviour may reveal whether a particular individual who had not been contributing to the discussion did so because they felt alienated by the process or simply because they were shy.

As mentioned in section 4.4, observational data can take a number of forms. Hand-written notes or field diaries taken by the evaluator throughout the process, which may be augmented by still photographs or video

footage, can provide a record that can be subjected to analysis in the same way as qualitative data from interviews and focus groups.

At the same time, systematised observations can range from quite simple tallies of attendance at an event and basic demographic information, to fairly complex categorisations and coding of behaviour. These data can be fairly straightforwardly analysed in a standard spreadsheet package. As the amount of data grows and the forms in which they are held multiply, it is likely to become more appropriate to use one of the specialist analytical tools for qualitative research.



Reporting

6

6.1 Reporting

Gathering and analysing data is all very well, but reporting, or sharing data, is where the benefits of good evaluation start to be realised. There are four main audiences for evaluation:

- You and your team.
- Your funder.
- Other stakeholders.
- Your peers.

6.1.1 You and your team

Evaluation plays an important role in helping you to improve your engagement activities. So, the primary audience for much of the evaluation is your team. What have you learnt? How will you apply this in the future? Are there things that you've learnt that carry across, not just to other public engagement activities, but your other work or your interactions with funders and users?

Choose the most suitable format for your report. It may be in writing, but it may be that a presentation enables the team to reflect better on their experiences.

6.1.2 Your funder

Whoever has provided the resources for your activity will probably want to know what they've got for their money, so the first aim of your evaluation report is demonstrating the outcomes and impact. However, funders are interested in sharing good practice, so if there are important pieces of learning, share them.

Your funder may have given you a standard format for your report. You should use it, even if it is constrictive. They probably use the standard format to allow them to sum data or collate information from across different activities, so they can report to their seniors and account for their budgets. If there are other things that you want to say, send an additional note or report. Few funders are likely to complain about getting too much feedback. You never know, you might want to approach them again, in which case you should show how effectively you managed the activity and how thoroughly you evaluated it and reported on it.

6.1.3 Other stakeholders

You may have had partners who contributed resources, people or expertise to the event. Make sure that you share your evaluation results with them. It will help them to assess the value of their contributions and may influence their future decisions on getting involved in future activities, either with you or others.

6.1.4 Your peers

Finally, there are your peers who are getting involved in public engagement work. You may know some directly, but also talk to your funder about any networks they have or are aware of, for sharing good practice. Your evaluation could provide the answers that someone else has been looking for. It might be that you've cracked a problem, or that you stumbled into a trap that you can help others to avoid. It takes some courage to admit the latter, but people will be very grateful and in the future they may repay you with valuable advice. You might want to post your evaluation at http://www.britishscienceassociation.org/forms/scicomm/evaluation/access/ so others can learn from your experiences.

6.2 Report structure

Your report should be structured around the questions/objectives your evaluation set out to address. These should stem from the objectives you set for your activity. Monitoring information is also likely to have a role in your final report. For clarity, you should have: (see table overleaf)

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Section	Contents
Executive summary	Some people, especially senior people in funding organisations or those on assessment panels, will only read this section. It should therefore set out the activity's objectives and give a short description of the activity, but importantly, it must pull out the key points. There are two main styles for summaries. An executive summary should mirror the structure of the full report so that anyone who wants more information on a certain section can easily find it. A general summary is shorter and more narrative in style. This means you should think about which style is required and write this section last.
Introduction	Sets out: • the background to your activity, • why you wanted to do the activity, • what you hoped to achieve and why, • the aims and objectives of the activity, • the aims and objectives of the evaluation, • the structure of the remainder of the report.
Objective 1	The objective and data relating to whether it was met with some discussion as to why the actual outcome occurred.
Objective 2, 3, etc.	As above.
Unexpected outcomes	Describe any unexpected outcomes and whether they are good or bad.
Conclusions	A summing up of the key achievements of your activity, its strengths and weaknesses.
Lessons learnt	What you would do differently next time and why. Key learning points for others. A discussion of unexpected outcomes and how to ensure they either occur or not again, as appropriate.
Annexes	Include: • full details of your methodology, • how you selected your sample, • copies of questionnaires and topic guides, • some information about how you analysed your data.

For the sections about the objectives, try to turn the objective into a question or several questions. Then assess all the information you have from both monitoring and evaluation and allocate each piece of information to a section of the report. If you have information that doesn't add anything, don't include it.

Don't feel you have to report every piece of detail. It can be useful to have short 'conclusions' at the end of each main section that sums up the main points from the section.

The use of charts to illustrate numerical data, which can easily be derived if you have your data in a spreadsheet

such as Excel, will help you and the reader to identify highs and lows and trends. Use bullet points under tables, charts and graphs to highlight the main points. Quotes from interviews and focus groups will serve to bring to life the spirit of the activity. Think about how you might use images to illustrate your research findings. Some people like to have this sort of detail in annexes to keep the main report short. You'll find that different people have different preferences about how data is presented, so it is sensible to check with key readers, such as your funder, to see what they prefer.

The conclusions section should pull together all the data and get to the point of 'what does it all mean'? 'So what?' What do the preceding sections tell you in a nutshell? Some people will only read this section, especially if there is not an executive summary.

You should use Plain English. Your report should be accessible to as many people as possible. The main audiences will be other people like you and your team and your funder. Remember, many funders will not be evaluation experts either.

Do not be tempted to use jargon. There are occasions however, when you'll want to use very precise terms. If you do, make sure you define them somewhere so all

your readers know what you mean. For example, this guide has a glossary of terms.

Don't be afraid to make value judgements or give your views, especially when you're considering how you might do things differently next time. Remember, you have learnt a lot from conducting your activity and can speak with some authority, especially if you've backed it up with good evaluation data.

Annex 1
Evaluation Questionnaires and Questions

Questionnaire design

This section focuses on designing paper questionnaires for self completion surveys. The process of designing on-line questionnaires, which will also be completed by the respondent, is very similar. You can 'route' people so they are not asked questions that are not relevant to them based on their previous answers in paper questionnaires, but with on-line questionnaires you can program the routing and so it can be much more complex, for example, combining the answers to more than one question.

Make the respondent's experience positive

Make sure that the respondent finds the experience straightforward. They may even gain something from the process.

Make sure that your language is appropriate to your audience. This is especially important with younger audiences, but also bear in mind that general literacy levels in the UK are not the same as those of graduates and that for some people English may not be their first language.

You can use colour, pictures, cartoon "smiley faces" or other lighter approaches, but make sure these match the mood of your event. You want to engage respondents, but you do not want them to feel that you are being condescending.

Make sure your respondent has the chance to say what is on their mind e.g. by using a general open-ended question at the end.

If possible, pilot the questionnaire on a few people before circulating it widely. This will help you identify any difficulties with wording or concepts. Even piloting it on your colleagues, friends or family will provide some useful feedback on how to clarify the questions and the way you ask them.

Reluctance to give feedback

This can be the curse of feedback questionnaires – people either don't want to hurt your feelings, so tone down their comments; or forget themselves and launch scathing attacks that don't really help you to improve. The key is to ensure that people understand their feedback is important and can help you. Emphasise that critical feedback will help you get better and that it won't hurt your feelings (even though it might) and that positive feedback also helps, because it shows what works well.

The problem with leaving questionnaires for the audience to complete on leaving an event is that those who had a great time are most likely to fill it in. Those who hated it are also more likely to fill it in than those who had an OK time. Also, some people will just want to leave and not have the time or the inclination to complete the questionnaire, although leaving a few minutes at the end of the activity for people to fill in a questionnaire may help. However, unless you have some way of ensuring that a high proportion of those you target complete the questionnaire, the results will not necessarily be representative of your whole audience and you will not be able to tell in what ways or to what extent the results are biased.

This is not to say that the data is useless, but it needs careful interpretation and if you can calculate or estimate the proportion that completed a questionnaire, this will help you assess the accuracy of your results. The higher the response rate, the more representative the results will be and anything over 65% is very good. If everyone who engaged with your activity responded, the data is robust, even if there were only six people. Just don't try percentaging on fewer than about 100 people.

Maximising the response rate

If your activity is an event, distribute the questionnaire at the start and ask people to complete it before they leave.

- Make the questionnaire short, simple and relevant.
- Use pre-paid envelopes to increase the response rate where you have distributed questionnaires by post or where you think people will want to post back the questionnaire.

Asking people to complete their questionnaires at the end of engaging with your activity will increase your response rate and may improve the quality of the information you gather. However, it will mean that you can only ask relatively few questions because people will only be prepared to give a limited amount of time. You also need to think about the time people have for reflection. You may get a more considered response when people have had a chance to think about the activity later.

Remember, try to make it fun. In response to a consultation on up-dating this guide, one respondent said that at a talk about aerodynamics the audience was asked to make their feedback questionnaires into paper aeroplanes and there was a prize for those who could get their plane into the box at the front!

Confidentiality/data protection

You must take all reasonable steps to make sure that the respondents are not adversely affected by taking part in the evaluation. You must keep their responses confidential, unless you have their permission to do otherwise, and you must not do anything with their responses that you have not informed them about. So, unless you made it clear when you gave them the questionnaire or on the questionnaire itself, you cannot use the results to build a database for marketing, for example.

There are two useful sources of information: the Information Commissioner's Office website, and the Market Research Society website, which has various codes of conduct relating to data protection and confidentiality issues.

For the Information Commissioner's Office: **www.dataprotection.gov.uk**

For market research guidelines: **http://www.mrs.org.uk**

If you are working with children or vulnerable adults, such as people with learning difficulties or the elderly, you and your team should be checked by the Criminal Records Bureau. See **http://www.direct.gov.uk/en/Employment/Startinganewjob/index.htm?CID=EMP&PLA=url_mon&CRE=crb** This is very important for any contact as well as part of the evaluation as for contact during your project.

Length

Keep it focused, simple to complete, and as short as possible – one to two pages. This will maximise the number of responses and minimise the time it will take you to analyse it.

Do not ask for information that you do not plan to use: it wastes everyone's time. However, do not worry if you ask questions which later prove not to be useful; just don't ask them next time.

Structure

Design the questionnaire as a funnel, moving from simple, unthreatening and non-sensitive questions, to those that require more thought and maybe more personal information.

Most questionnaires will benefit from a mix of 'closed' or 'pre-coded' and 'open' questions, where people enter their response in their own words, as this helps to keep people interested.

It is usually best to place sensitive questions towards the end and always give a reason why you want personal information such as demographic data (e.g. age, sex, education, and ethnicity).

Avoid long batteries of agree/disagree questions, as respondents will drift into giving automatic answers - break up questions visually if the questionnaire is long.

Avoiding bias

There are many different sources of potential bias in research. These include:

- Questionnaire bias - leading questions.
- Methodological bias - for example, on-line surveys exclude people who do not have internet access.
- Sampling bias - for example, asking for feedback only from those who asked questions at an event may be a very poor indication of how the audience as a whole felt.
- Response bias - those who complete questionnaires may be very different from those who don't. This is a major issue for all survey research.
- Question bias - most people like to put themselves and their behaviour in a good light. If you ask a question which embarrasses the respondent or makes him/her feel bad, they may massage the truth. So, for example, asking "*How often do you eat chips?*" rather than "*Do you eat chips?*" gives people permission to say that they do without feeling that they shouldn't, and those that don't, just say never!
- Interviewer bias – the nature or behaviour of the interviewer means that people are reluctant to give some possible answers. The way that you frame discussions and who is present, as well as the way you look and speak – can have a significant effect on responses. It's impossible to entirely neutralise these things, but you can at least be aware of the effect you may have.
- Biased scales – that have, for example, lots of options for 'good', but only one for 'bad'; for example, excellent, very good, fairly good, not very good.

Question design

The most important things in question design are:

- avoid leading questions.
- avoid biased scales.
- never ask two questions in one, you don't know which part people have answered; for example, 'would you say that you understood the speaker and the discussant?'
- never ask hypothetical questions, for example, 'will you go back to work after your baby is born?' You can ask: 'do you plan to go back to work after your baby is born?'
- make sure measurement bands don't overlap. So don't ask 'how old are you?' with a set of tick box answers that run 15-40, 40-60, 60 and over. The answers must run: 15-39, 40-59, 60 and over, otherwise those aged 40 and 60 don't know which box to tick.

There are a number of different types of questions you can use and below is an introduction to each.

Pre-coded questions

These are the easiest questions for people to answer and the easiest to analyse, but they can be difficult to draft. Pre-coded questions take the form of a short question that encapsulates one thought, followed by a list of possible answers. People are asked to tick one or more of the answers. A typical question would be gender – people just tick their gender from the 'male', 'female' options. Another typical question would be: 'Which sections of the exhibition did you enjoy? Please tick all those that apply.' The question would be followed by a list of the exhibition sections and people would tick all the sections that they enjoyed.

These types of questions are easy to analyse because you just add-up the number of people giving each response.

They can be difficult to draft because they need to be very clear and the answer list must be relevant to the question and understood by the respondent.

If you are using 'pre-coded' questions, you need to be confident that the categories chosen reflect the spectrum of actual experience. If you ask people what their favourite subjects were at school and offer "maths", "science", "design and technology" and "other" as options, but your activity was based in an art gallery, you're not likely to get a very accurate picture of people's real favourites. You can always use an "other, write in" category to capture anything you've missed,

but remember you'll have to read it before you can analyse it. Or you could just have 'other' and don't forget to add a 'don't know' option. However, if the list is too long some people will only tick the top few and not read the full list. Piloting the questionnaire will help you to ensure that you have as full a list as possible.

Using scales

The 1-5 Likert scale is the most commonly used form of rating. It is simple to understand and relatively discriminating. The scale is commonly anchored descriptively e.g. 5= Agree strongly, 4= agree, 3= neither agree nor disagree, 2 = disagree, 1 = disagree strongly. You should also add a "don't know" category. Other scales that are used include scoring on a line of one to ten or a percentage score.

Another way of differentiating between people's view is to present them with statements that the respondent chooses between. These are often ordered on an implicit scale, but you are asking the respondent to tick the one that best fits their view when in fact they may not agree with any of those presented. An example of this type of question is:

Which of the following statements best reflects your feelings about science today?

a) It's continually making our lives safer and better.
b) It's changed many things for good, but I wonder how much more there is that can be achieve.
c) It's producing lots of new things, but I'm not sure we need them all.
d) It's out of control and damaging our lives and environment.

When it comes to the analysis all you can really do is present the percentage of respondents who agree with each statement.

Ranking

Rank ordering is best avoided – many respondents won't do it properly, unless you stick to asking for first, second and third choices. Otherwise people get confused and get pushed in to declaring preferences they don't really have or they may just give up. You can get round this by asking how important an issue is, using a Likert scale.

Attitudinal questions

Attitudinal questions are usually asked using Likert scales and it is usual to have a set of attitudinal questions that together give you an overall impression of the attitudes of the respondents.

If you have a set of attitude statements, some should be positive about your activity and an equal number should be negative. In general people are more likely to agree with statements than to disagree and you need to be aware of this in your analysis. Be careful not to have statements such as "*There is no point in studying history*". It's very difficult for people to know whether they should agree or disagree. People who agree might say, 'no, there isn't', rather than 'yes, I agree'. If you're using negative statements keep it short – for example, "*Studying history is pointless*". Then people can say 'yes, it is'.

True/false statements

A good way to test whether people have learnt anything, or whether they knew anything in the first place, is to ask true/false statements, but you need to be sure that there is certainty on the issue.

Open-ended questions

Open-ended questions allow respondents to answer questions in their own words, but you have to read them all. Also, some people will be very brief or say nothing, so you may not be very enlightened by their responses. However, an open-ended question at the end of a questionnaire acts as a catch-all. If you want to use open-ended questions here are some guidelines.

- Use broad openers: Who, what, where, when, and (especially) why, to encourage people to express themselves.
- Balanced open questions (why did you like [it], why did you dislike [it]) help the respondent structure an answer without feeling pressured to give a particular reply.

- In face-to-face interviews conducted by an interviewer, using open phrases such as 'Tell me about', 'Tell me more,' or 'Why do you say that?' encourages people to talk.
- Avoid questions that can be answered with a simple yes or no.
- Avoid asking more than one question at the same time.

Analysis

Think about how you will use the data collected when drafting your questionnaire.

If you want to calculate the average age of visitors, using bands 16-25, 26-40, 41-60, over 60 will not allow you to do so. You will need to ask actual age.

Questionnaire checklist

Below is a checklist that will help to ensure you have a clear, easy to complete and analyse questionnaire. You can just initial the row when you've done that task and add the date to keep track of where you are. It might be helpful to also keep notes of why you made certain decisions about the questionnaire.

Section	Initials	Date	Notes
Question format & wording			
Do all questions have one unambiguous focus (i.e. there are no 'two in one' questions)?			
Do questions have 'don't know' codes (for most questions this will be a valid response)?			
Do multiple response lists have 'none of these' options (where this could be a valid response)?			
Do single-response questions have an instruction asking the respondent to 'tick one only'?			
Do multiple-response questions have an instruction asking the respondent to 'tick all that apply'?			
Where answers are sought as numeric values, are there instructions telling respondents what format to enter their data in (e.g. for five please write/type as 5) and if necessary, what unit (e.g. UK pounds). This is more important for on-line surveys but will help with data entry of paper questionnaires.			
Top and tail			
Does the introduction contain all necessary information about confidentiality, purpose, length and contacts for further information?			
Has a re-contact question been asked? (Follow-up research will be difficult without this as the Information Commissioner's Office doesn't really like it and it contravenes the Market Research Society Code of Conduct).			

Section	Initials	Date	Notes
Overview			
Has the questionnaire been piloted or checked for sense by colleagues?			
Have questions been mapped against the information you need?			
Is the number of open questions appropriate or is it likely to cause an unreasonable amount of coding?			
Is the number of open questions appropriate or is it likely to put an unreasonable burden on the respondents?			

Annex 2
Questionnaire modules

This section provides some questionnaire modules that can be copied into your questionnaire. These modules will also enable you to design similar questions on other issues that you want to ask about.

Who was there?

To get basic socio-demographic information use simple tick boxes.

There are a tremendous number of characteristics that can be explored. You need to focus on what matters in relation to your objectives. Is it people from a geographic location, of a particular age or a certain mindset that were important to you? Do you want a mix of gender and/or ethnic groups or are you specifically targeting one group?

People can be very sensitive about giving this type of personal data, so you should explain why you want it. That's why it is usual to leave these types of questions until the end of the questionnaire. If people really don't want to give you this information, they will still have given you feedback. If you put this first and they don't want to complete it, they won't answer the other questions either.

Q So that we can see the types of people who came to our event, for each of the questions below, please tick the box that best fits you.

OR

Q So we can analyse the findings from this survey for different groups, for each of the questions below, please tick the box that best fits you.

Are you

Male ☐
Female ☐

Are you

In full-time education ☐
Employed – full-time ☐
Employed – part-time ☐
Not currently employed but looking for work ☐
Retired ☐
Other ☐

Which of the groups listed below do you consider yourself to belong to

White ☐
Black-African ☐
Black-Caribbean ☐
Black - Other ☐
Pakistani ☐
Indian ☐
Bangladeshi ☐
Chinese ☐
Other (please write in) ☐

What was your age last birthday?

Less than 16 ☐
16-30 ☐
31-45 ☐
46-50 ☐
51-65 ☐
Over 65 ☐

Approximately how far from here do you live?

Less than 1 mile ☐
1-5 miles ☐
6-15 miles ☐
More than 15 miles ☐
Don't know ☐

If you want to calculate the average age of visitors, you will need to ask people to write in their actual age.

What were their attitudes?

For attitudinal information it is probably most appropriate to use Likert scales. A good source of attitude questions is the Public Attitudes to Science series. The Department for Business, Innovation and Skills (BIS) defines 'science' as follows:

By 'science' we mean all-encompassing knowledge based on scholarship and research undertaken in the physical, biological, engineering, medical, natural and social disciplines, including the arts and humanities, which is underpinned by methodologies that build up and test understanding about our world and beyond. http://www.bis.gov.uk/policies/science/science-and-society

The most recent report and questionnaire can be accessed http://interactive.bis.gov.uk/scienceandsociety/site/

The above report also gives the figures for the responses of a nationally representative sample of adults to these statements. This means that you can develop a picture of how typical your audience is of the wider public.

Below is a series of statements that people have said about science. For each please tick whether you agree strongly, agree, neither agree nor disagree, disagree, disagree strongly or do not know.

Statement	Agree	Agree Strongly	Neither	Disagree	Disagree Strongly	Don't Know
The speed of development in science and technology means that it cannot be properly controlled by Government.						
Science is getting out of control and there is nothing we can do to stop it.						
It is important that young people have a grasp of science and technology.						
The benefits of science are greater than the harmful effects.						
Science and technology are making our lives healthier, easier and more comfortable.						

What did they learn?

Here are some examples of true/false questions. You will be able to develop your own, depending on your field.

For each of the statements below, please tick whether you think it is true or false or whether you don't know.

UK law states that all medicines must be tested on animals before being used on people

Please put X in the appropriate box

True ☐
False ☐
Don't know ☐

Any researcher in the UK can carry out experiments that involve people without a licence

Please put X in the appropriate box

True ☐
False ☐
Don't know ☐

The testing of new drugs on people is not regulated in the UK

Please put X in the appropriate box

True ☐
False ☐
Don't know ☐

You need a licence before you can plant genetically-modified (GM) crops in the UK

Please put X in the appropriate box

True ☐
False ☐
Don't know ☐

The Government does not regulate the disposal of radioactive waste in the UK

Please put X in the appropriate box

True ☐
False ☐
Don't know ☐

There are strict laws governing the use in research of government papers

Please put X in the appropriate box

True ☐
False ☐
Don't know ☐

Did the event work?

At one level you might want to know if people simply enjoyed engaging with the activity. Give them the chance to tell you, but you can get more value by following-up the question and asking them to say why. You can do this by having a list of possible reasons and asking them to tick those that apply to them. Or you can ask them to write-in using their own words. This "write in" approach works best for small numbers of respondents, because you'll need to read what people have written. For larger numbers of people "pre-codes" will be more manageable, but leave open the "other" option so that you can capture answers you hadn't thought of.

You might be looking for more sophisticated feedback. If the primary function of the activity was to give participants the chance to contribute their views and comments, it is important to see whether this has been achieved and what factors have enabled, or hindered, effective participation.

If information provision was part of the process was it accessible and useful? Similarly, if you were using "experts" how was their contribution rated?

You might also think about what the experts experienced. Did they enjoy the process, what have they learned, have their attitudes changed?

The examples below show some of the questions that you might consider asking. For these "did it work for you?" questions, the most valuable bit of feedback can be the why or why not that underpins the yes or no answer, so it is always worth leaving some space for this.

1. I enjoyed the event

Please tick the box that best describes your view

Strongly Agree ☐ Agree ☐

Disagree ☐ Strongly Disagree ☐

2. Please write in which part of the event you enjoyed the most

3. Please write in which part of the event you enjoyed the least

4. What do you think I should change about the event?

Were you able to express your views freely and openly?

Please put X in the appropriate box

Yes completely ☐

Yes, but sometimes I felt nervous ☐

Not as much as I would have liked ☐

(if you tick this please say why in the box below)

Not at all ☐

(if you tick this please say why in the box below)

Why was this? Please write-in

Don't Know ☐

Did you understand the talk?

Please put X in the appropriate box

Yes, easily ☐

Yes, but only after the discussion ☐

Not very well ☐

(if you tick this please say what might have helped in the box below)

Not at all ☐

(if you tick this please say what might have helped in the box below)

What might have helped you understand the science more easily?

Please write-in

Don't Know ☐

Did you find the experts:

Please put X in any box you agree with

Helpful? ☐

Confusing? ☐

Able to answer your questions? ☐

Self important? ☐

Did not want to listen to your opinions? ☐

Able to explain themselves clearly? ☐

Eager to listen? ☐

If you'd like to say anything else about the experts, please write it in the box below

Annex 3
Summative Evaluation Schema

Below is a schema to help you think about the type of information you want and how you might collect it, depending on the nature of your activity and your objectives. Remember: To measure change you need to have a baseline from before the audience engaged with your activity and another set of data taken after they took part. You will need to ask exactly the same questions before and after.

Monitoring Data

Nature of data	Discussion/ Meeting/ Talk	Website	Products e.g. poster/ CDROM/video	Exhibition/ Open day	Show/Play	Competition
Number of people.	Count people on entry.	Count hits.	Number distributed.	Count people on entry.	Count audience on entry.	Count entries.
Types of people.	Categorise people at registration or by observation or questionnaire	Pop-up questionnaires on the site or registration procedures.	Use of order/request forms and questionnaires.	Categorise people on entry by registration or questionnaire.	Use ticket sales or booking mechanisms to gather information.	Count entries.

Evaluation Data

Nature of data	Discussion/ Meeting/ Talk	Website	Products e.g. poster/ CDROM/video	Exhibition/ Open day	Show/Play	Competition
Change Change views/ attitudes. Change behaviour. Increase interest. Increase knowledge.	Ask people for baseline views on a paper questionnaire while they wait for the event to start or when they register to come.	Registration questionnaire on the site to gather information.	Distribution methods will affect the ability to collect initial data. Using an ordering mechanism allows data to be gathered.	Ask for baseline views on a paper or e-mail questionnaire when people register to come or buy tickets.	Ask for baseline views on a paper or e-mail questionnaire when people book or buy tickets.	Building in an initial data gathering exercise to the competition process will allow baseline data to be gathered.
Quality/fit for purpose Strengths. Weaknesses.	Observe the event. Use exit questionnaires and/or follow-up focus groups or questionnaires.	Include questions on this in a questionnaire hosted on the site. Record dwell time per page and page requests.	Follow-up questionnaires and focus groups.	Exit or follow-up questionnaires. Short face-to-face interviews during the event. Observation.	Follow-up questionnaires. Group discussions.	Use entry mechanism to gather feedback.
Interaction with activity.	Observation of dynamics will help you plan better events in the future.	Record the order in which pages are accessed and dwell time per page.	Observation of users and questionnaires.	Observation. In-depth interviews or focus groups and questionnaires. Feedback from staff/colleagues.	Observation. Questionnaires	Implicit in taking part, use entry numbers as a measure.
Level of discussion Obtain views on issue.	Listening to the conversations, record key points.	An interactive e-mail facility will allow this.	Not a good medium for getting people's views. Can use these as a stimulus and then use group discussions and questionnaires	Comment books and exit questionnaires. Build in opportunities for staff/ colleagues to engage with visitors.	Not usually designed for giving feedback. Can use debate after the performance.	Can build this in to entry process, but not a normal mechanism for getting people's views.

Annex 4
Glossary

Activity
Unless a specific activity or approach is being discussed, this guide uses the term activity as an all-encompassing phrase for talks, shows, teachers' packs, hands-on events, websites and the many other ways that researchers are using to engage general audiences.

Aim
The aim of your activity is what you ultimately want to achieve. The aim is supported by a number of objectives that will help you to realise the overall goal.

Audience
The audience is the people with whom you are trying to engage.

Baseline
A measure at the beginning of an activity that enables determination of change, if any.

Census
A survey that collects data from everyone.

Charting
A method for analysing qualitative research data.

Data
Information collected through monitoring and research.

Evaluation
Evaluation helps you to see whether or not you have achieved your objectives and to identify ways to improve what you do during and after your activity.

Evaluation strategy
The plan through which you will determine whether or not you have achieved your objectives.

Exit survey
A survey of people undertaken as they leave an event, exhibition, etc. Usually conducted by an interviewer rather than a researcher.

Face-to-face interviews
Used in market and social research to mean structured quantitative surveys conducted face-to-face.

Focus group
A research method that involves a group of usually 6-8 people convened to discuss a particular topic.

Formative evaluation
Research that takes place during the development of an activity to ensure it meets the audiences' needs.

Funders
The funders are the people who provide the resources that allow you to undertake your activity.

In-depth interview
An interview conducted by a researcher using a topic guide, which allows respondents to express themselves in their own way and raise issues the researcher has not considered.

Interviewer
A person who conducts interviews following a predetermined questionnaire designed by a researcher.

Milestones
Milestones are interim measures that allow you to monitor whether or not you are on track to meet your objectives.

Observation
Formalised observation of behaviour, either directly or from a recording.

Objectives
Objectives are the tangible things through which you will achieve your overall aim.

Outcomes
Outcomes are measures of the impact you have had on people.

Outputs
Outputs are the things you produce as part of the activity e.g. a website, a leaflet.

Pop-up questionnaire
A questionnaire that literally 'pops-up' on entering a website to collect information about users and usage of the site.

Programme
There is no blueprint for a programme, it is likely to contain one or more of the following features:

- A funding mechanism to which other people or organisations can apply.
- A budget to commission specific pieces of work.
- Resources to undertake in-house activities.
- A reporting process, through which the programme manager bids for resources and accounts for their use.

Programme manager
Someone who has overall responsibility for delivering against a set of pre-determined objectives, and uses a variety of activities and actions to achieve these objectives. Often works for a funder.

Project management
Project management in this context is simply the procedures through which you ensure you deliver your activity.

Project manager
The project manager is the person ultimately responsible for the activity.

Qualitative research
Techniques that allow people to express themselves in their own words and to raise their concerns, usually via in-depth interviews and focus groups conducted by researchers, helps you to understand why people do or say what they do or say.

Quantitative research
Techniques that ask people the same questions in such a way as to enable the answers to be added together for a sample that is representative of the target group, thus providing numerical data on the percentage of people with particular views or behaviour.

Questionnaire
A structured set of questions calling for a precise response that allows answers from all those who complete it to be added together.

Quota sampling
Setting 'quotas' to ensure a sample has the same percentage of people with specific characteristics as the population of interest. Requires other data giving the information on the population.

Researcher
A person who is involved in designing and overseeing a research project.

Sampling
A way of selecting people to take part in research that ensures they are chosen to be representative of the population of interest, although not always in a statistical sense.

SMART
All objectives should be SMART, which stands for:

- Specific;
- Measurable;
- Achievable;
- Relevant; and
- Time-bound.

Stakeholders
Those who have a legitimate interest in your activity, e.g. audiences and funders.

Sub-contractors
Sub-contractors are people or organisations employed by the project manager to deliver specifically defined products or services.

Summative evaluation
Evaluation at the end of an activity that determines whether or not the objectives have been met.

Systematic sampling
Taking every 'nth' person who engages with an activity. Produces a statistically representative sample.

Topic guide
A list of questions and issues a researcher wants to cover during an in-depth interview or focus group.

User
For the purposes of this guide, someone who engages with an activity.

Annex 5
Further reading

Finding information on evaluation

The term 'evaluation' is used widely in education, social policy, and training and it is in these areas that you can find papers and books devoted to evaluation as a distinct tradition. Elsewhere, tools and techniques used in evaluation are simply the application of research methodologies. There is little written that is specific to public engagement or communicating about research – it is often a case of borrowing and adapting methods that have been used successfully in other fields.

Evaluation Methods

Breakwell, G. and Millward, L, (1995) Basic evaluation methods BPS Books, Leicester. 145 pp

A good general introduction to evaluation, which can be applied in a range of settings. Contains case studies and examples that are relevant to communicating research findings, e.g. evaluation of a museum exhibition, and covers a wide range of research methods, including questionnaire construction and time series. Contains an interesting section on the politics of communicating evaluation results to audiences.

Web Resources

The main web resources that will help you with your evaluation are the websites of various evaluation societies (usually specialising in educational or social policy research). There are also some useful 'hints and tips' sites, mostly US-based, written by academics and general enthusiasts, all you need to do is enter search terms in a search engine. There is an increasing set of work that aims to help those who want to evaluate their public engagement activities.

General Evaluation Resources

http://www.evaluation.org.uk/resources/online-resources.aspx
Website of the UK Evaluation society.

www.eval.org
The American Evaluation Association.

http://www.reviewing.co.uk/evaluation/index.htm
General articles on getting the best out of course evaluation, with tips and links.

http://gsociology.icaap.org/methods/
Set of links to US-based evaluation resources, with a basic guide for the non-specialist.

http://www.mapnp.org/library/evaluatn/fnl_eval.htm
A US-based basic guide to program evaluation including outcomes evaluation. Useful overview of methods and issues.

www.mrs.org.uk
The UK Market Research Society's website has up-to-date guidance on ethics and confidentiality in interviewing the public.

www.dfes.gov.uk
Department for Education has data on individual school examination results at various Key Stages, GCSE and 'A' level.

http://www.cdc.gov/eval/resources.htm
Digital Creativity special issue on evaluation, 2009. Wide range of professional on-line evaluation resources. Comprehensive listing of evaluation resources, materials, guidelines etc. (American based).

Evaluation resources aimed at those engaging the public in their research

http://www.raeng.org.uk/societygov/public_engagement/ingenious/evaluation.htm
The Ingenious Evaluation FAQs give examples of good practice in evaluation and ideas on using creative approaches.

http://caise.insci.org/resources
Excellent overview of American (NSF funded) evaluation resources, including toolkits plus work across various informal environments including zoos & aquaria.

http://caise.insci.org/resources/Eval_Framework.pdf
NSF evaluation framework.

http://practice.ie/blogs/heather/ideas-and-examples-creative-evaluation-kids
CAISE Framework for Evaluating Impacts of Informal Science Education Projects.

http://www.scidev.net/en/practical-guides/evaluating-science-communication-projects-1.html
Joubert, M. (2007) Evaluating science communication projects. SciDev Net, 8th January 2007.

http://www.impact.arts.gla.ac.uk/
The Impact Database is a bibliographical database relating to research on the social and economic effects of arts, culture and major events.

http://www.publicengagement.ac.uk/
The National Co-ordinating Centre for Public Engagement is funded by the UK Higher Education Funding Councils, Research Councils UK and the Wellcome Trust to help academics engage with the public in their research. The website has a host of resources to support university staff and students to develop public engagement activities.

http://www.ucl.ac.uk/public-engagement/research/toolkits/Methods
A series of documents collated by University College London to support academics in the evaluation of their public engagement activities.

http://www.ucl.ac.uk/public-engagement/research/framework
A framework for evaluation put together by the UCL Beacon for Public Engagement for academics who want to evaluate their public engagement activities.

http://www.manchesterbeacon.org/files/manchester-beacon-pe-evaluation-guide.pdf
A guide to evaluation put together by the Manchester Beacon for Public Engagement for academics who want to evaluate their public engagement activities.

http://www.britishscienceassociation.org/forms/scicomm/evaluation/access/
This database is managed by the British Science Association and is a resource for those interested in engaging people with science & engineering. The objective of the database is to share learning. It is free to upload your evaluation and to access the database.

If none of these suit, try entering key words into a search engine.

For help on planning your activity see: **http://www.vitae.ac.uk/CMS/files/upload/The_engaging_researcher_2010.pdf**

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