Science dialogues

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Did it work? How to evaluate your project's impact

In the Impact evaluation section we addressed some issues about the importance of evaluation, the main points of an evaluation plan and the considerations to make before starting a science communication related initiative. This section aims at being a simple tool to practically guide you along the evaluation process.

In the appendix you will find an *Evaluation plan worksheet* that might help you in designing your own evaluation plan.

Step 1. Determine what you want to evaluate

It is fundamental to identify exactly what you want to evaluate. It is very difficult to evaluate every aspect of a whole project, whereas it would be easier to select the single activities or sub-components of the project.

For example, you might want to evaluate some *strategic initiatives*, such as **brand awareness** (how key audiences perceive your institution/group), **repositioning effort** (the outreach group of your institution aims to change focus or add new target audiences), **communication initiative for policy or behavior changes**.

Figure 124. This collection of words and ideas can represent your starting point for evaluation
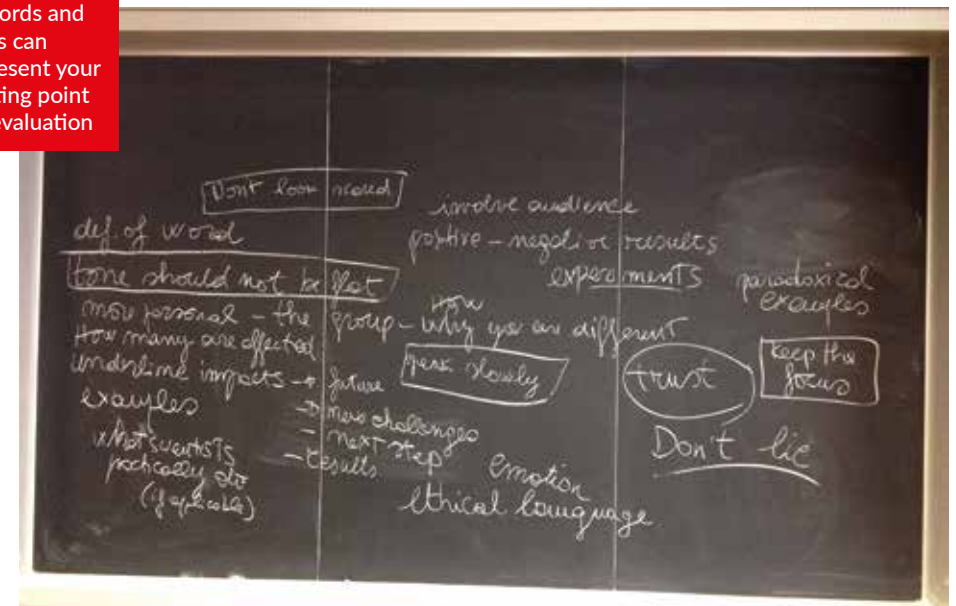
Or you might focus on some *tactical efforts*, such as a particular **message dissemination**, the **quality of communication with your audiences,** the **quality of your materials** (video, slides, leaflets, etc.) or the **media coverage**.

Step 2. **Define your goals**

Goals correspond to what you want to accomplish in the end, **the ideal outcome of your effort**. Goals are usually long term (reachable in years) and should reflect your values and your organization's mission. We can divide **goals in two main groups**: **policy** goals, aiming at a positive change in government policy, and **behavior** goals, that reflect the way in which you would like people to change their behavior

Policy goals

Raising awareness: making people aware of an issue and why it matters.

Champions/Supporters: The aim is to identify and convince key individuals/groups to support your cause.

Public will: Public will is what ensures that your issue grows in prominence and action is taken.

Policy change: Work in order to modify a policy that you think is wrong or can be improved.

Behavior goals

The perception of scientists and science, the approach to STEAM subjects at schools, the way in which people use some natural resources, eating habits: all these goals imply changes made at individual levels. Some examples of this type of goal could be:

Awareness: Make your audience aware of your issue and why it matters is the first step for behavioral changes. Awareness is fundamental when your audience currently beliefs conflict with your main message, or in case your issue is completely new for them.

Salience: It refers to increasing the importance of your message and urge for a response, creating a sense of urgency.

Self-efficacy: Your science communication initiative could aim to prove people that they can make the difference in their own lives. For example, eating habits could change study-related performance.

Social norms: You may want to act on the perception of large groups with respect to a specific issue, such as the usage of gender appropriate language.

Behavioral intention: This goal aims at changing people's way of thinking. If, after an activity, many more students declare they want to go on studying

STEAM subjects, you might have reached your goal the following year.

Behavior change: It is the maximum level you could reach within behavioral goals. If unhealthy snacks disappear from the lunch-boxes of primary-school kids and get substituted by nuts and fruits, your initiative about food impact on child development directed to parents and grandparents was definitely a success.

Step 3. **State your objectives**

Objectives are different from goals: they are **more specific and need to be reached in a shorter time**. Usually you could select increasing objectives to reach your goal.

Good objectives have to be **SMART**, that means:

Specific – target a specific point to improve

Measurable – quantify or at least suggest an indicator of progress

Achievable – within budget and available resources

Relevant – Result-based or results-oriented

Time-bound – associated with a target date

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Goals, objectives, milestones

As the difference between Goals, Objectives and Milestones could not be that intuitive, we provide an example to make it more clear.

Five-year Goal
Support a local organization that fights school drop-out in teenagers

Objective 1: Create STEAM related training modules in which to involve students that have left the formal education path.

Milestone a: having young scientists as designers and activity leaders for some interactive laboratories.

Milestone b: having target students enrolled for the training modules.

Objective 2: Organize STEAM workshops in which school drop-out teenagers act as tutors to school professors.

Milestone a: having a group of target students interested in acting as tutors in workshops based on the training modules they took part in.

Milestone b: having school professors enrolled for the workshops.

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Once you write down your objective, check whether it passes at least 4 out of the 5 SMART criteria. If not, it would be better to adjust it.

Step 4. **Identify your target audience**

The audience of your evaluation is surely made of the same audience to which you directed the initiative, but sometimes it is useful to evaluate **additional audiences** too. Usually, if a specific group of children is the target of your science communication activity, it may be worth evaluating parents and school teachers. Moreover, it is very important to be **specific in selecting your audience and know it well** (see section Many different publics). The more specific you are, the more effective your evaluation and initiave will be.

Step 5. **Establish your baseline**

As scientists we know that zero is one of the most important values. **A baseline is fundamental to measure the output score of your effort**. So, for example, you could assess:

- Target public knowledge of and attitudes toward your institution and/ or issue
- Frequent misunderstanding and misinformation about your topic
- Audience values that directly influence your issue
- The way in which the issue you address has been usually presented or treated in formal education and informal schooling
- A list of additional audience or stakeholders who could influence your main audience by supporting or disapproving your point

If you did not establish a baseline before the implementation of your activity, you could try to determine one by getting data from past reports, public opinion surveys, past activities results, etc.

Step 6. **Decide your evaluation questions**

The answers to your evaluation **questions will reveal strengths and weaknesses of your project,** such as your choice of audiences, messages or tactics. Therefore, choosing the "right" questions is fundamental. Remember that the more questions you ask, the more work your evaluation will require and the more it will cost.

Some example of relevant questions are:

- Is the audience I choose the right one with respect to the goal?
- Are my messages suited for the communication channels and the audience that I selected?

Figure 125. Participants can leave their feedback after the activity: take a picture and keep it as documentation

- Are my messengers suited for the communication channels and the audience that I selected?
- How is the audience responding to my activities?
- Are my messages assimilated by my audience?
- Are there signs of change in behavioral intention or behavior change?
- Have I achieved my objective and goal?

Step 7. **Draft your measurements**

Choose the **relevant indicators** for your questions (different questions may require different indicators) and establish your measuring method. Taking into account your baseline, SMART objective and evaluation questions, try to determine milestones that reflect intermediate results.

Good **milestones** should be:

- Meaningful with respect to the objective
- Helpful to answer one/more evaluation questions
- Can be considered as preliminary achievement
- Measurable
- Linked to a deadline.

Step 8. **Select your evaluation techniques**

No, there are not only the surveys. There are **many techniques** to choose from to collect your data, both to establish your baseline and final (or even in-progress) results. The techniques you select **will modulate your evaluation costs** (money, time, professional resources).

In Table 7 we have listed some common and useful techniques.

Table 7. You can choose the techniques which best suit your needs to evaluate your program

Technique	What is it about	When and why to use
Interviews	You have to choose a set of open ended questions and submit them to a small group of people belonging to your target audience.	At any stage of planning or implementation. It would be useful to know how your stakeholders and audiences view the main elements of your project.
Focus Groups	Select a group of people involved in your project: they can come from the audience, from the staff, from other stakeholder groups. Discuss with them about some aspects of your activities. An expert facilitator has to guide this discussion providing some common questions, promoting the exchange of opinions and sprouting new points and data.	During planning, at early implementation stages and at the conclusion of the activities. Focus groups are especially useful when you want to test different ways of presenting a message, or knowing the opinion of your implementation staff.
Surveys – Online and In-Person	Surveys are mainly made of multiple choice questions and allow us to get many quantitative data. They can be printed or online and are very cheap. Surveys can also be administered in person, allowing the interviewer to also get some extra information through the observation of the respondents.	Surveys are useful for categorizing and comparing data in different moments. Therefore they are very convenient for setting up baselines and monitoring progress. Surveys should not be time consuming for respondents in order to make as many people as possible reply.
Qualitative data collection	Quantitative data are indeed very important, but since in science communication emotions are very important, it is relevant to get qualitative data too. Especially with kids, it could be hard to collect measurable data, but it is fundamental to get feedback. Drawings, short messages on sticky notes and essays could provide interesting information.	Drawings and/or short messages about issues could highlight the main assumption or ideas of your target audience. Repeating the task after your intervention could reveal changes in attitudes or beliefs also in little children (some examples are collected in Figure 20).
Observation	Observing your target audience while experiencing your activities could be very informative. It is necessary to prepare a grid/checklist with specific items to observe, such as the presence, frequency and intensity of behaviors. However, always leave space also for additional/contingent observations.	Observation is very useful during implementation to get information on how your audience reacts to the communication activity. Of course it cannot be made by the speaker/activity leader, but by another team member specifically prepared and appointed.
Quantitative Data Collection	If your project includes the construction/managing of websites, blogs and other online tools, you may collect a lot of quantitative data to analyze (number of visitors, number of interactions, comments, contributions, etc.)	Quantitative data collection is useful to monitor the changes over time. For sure it will be fundamental to establish the baseline and then to verify milestones and final score.

Step 9. **Estimate your budget**

As a researcher, it is likely that **considering evaluation costs** will not be your business; however be aware that it may consist of the following items: staff time; external consultant fees; cost of selected evaluation techniques; travel and incidentals; editing, design, production and dissemination costs.

Step 10. **Implement activity**

Now it is time to actually do your activity/initiative/program.

Step 11. Communicate the results

After the implementation of your initiative, you will have to **collect the final data**, as planned in your own evaluation process. **Analyze the data** and **write a report** about what you aimed to evaluate (see Step 1).

Analyze the results

We suggest you not to use too complex **mathematical analysis but clear and intuitive methods**. For example if you have a whole amount that expresses different qualitative values (*e.g.* how much your public likes an activity along a 5-point range) a simple pie chart works much better than bars, scatterplots, or more complex analysis, clearly showing the distribution on your sample.

Remember that to use each specific kind of **statistical tool you have to respect its assumptions** (*e.g.* having a large enough sample, normality, linearity and equality of variance) and usually the data you can collect for science communication evaluation cannot provide all these.

On the other hand, as in science, it is important to also look at raw data, understand it and find a proper solution. The average is often not informative or misleading (fig. 126).

Share the results

It is important to **share the evaluation report not only within your team but also with other stakeholders** of the whole science communication project such as the audience or the management/dean of your institution.

HOW MUCH DID YOU LIKE IT ON A SCALE FROM 1 TO 5?

| 1 | 2 | 3 | 4 | 5 |

N = 20
Average = 3

N = 20
Average = 3

N = 20
Average = 3
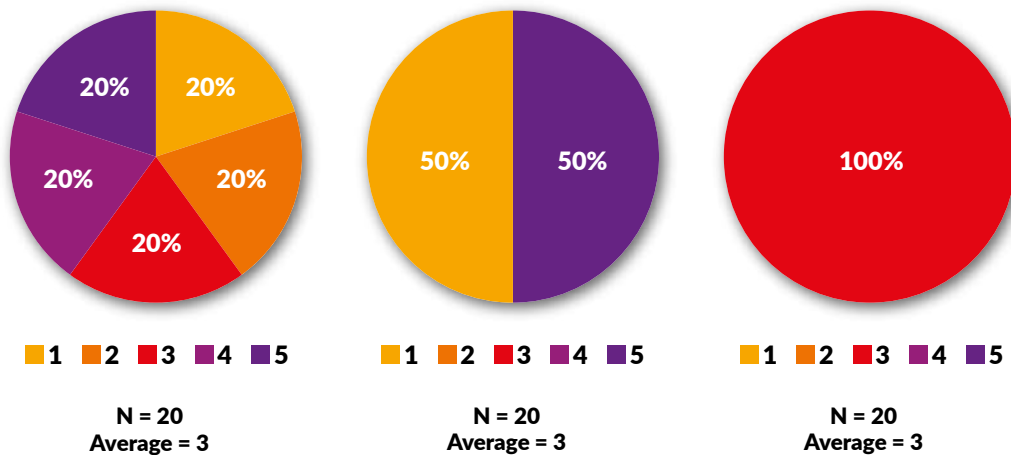
A good procedure could be to organise a "final report" meeting, where staff engaged in the project could discuss how to put in practice the results of the evaluation.

Step 12. Define an action plan based on the evaluation results

Evaluation is about learning — and as you have seen it implies a lot of work — so exploit it as much as you can to **find out what can be improved**. You should involve the other stakeholders in order to define not only *what* to improve, but *how* to do it.

The media: magazines, tv, radio...

The media and specifically journalists are a particular type of public very important precisely because of their role as **mediators with the rest of society.** Even if you don't feel like a talk show star, and don't even intend to become one, you may have to interact with journalists and **it is better to know what precautions to take in order for the interaction to be profitable**. Keep in mind that there are journalists and journalists: those specialized in science and technology and generic ones, those open and willing to know things and to do a good service, and those more superficial or even provocative. So, as always, even in this case the first rule is to know who you are facing as well as possible.

Another environment from which we cannot easily get away today is that of **social media**. These are **spaces of great freedom** that can offer opportunities to make yourself known, reach various audiences without mediation, tell your research with the cut you prefer, but at the same time **present risks** of being misunderstood, attacked or ending up in very polarized and difficult discussions.

Meeting a journalist: the interview

Scientists are often contacted by journalists for interviews: whether these are for the radio, television, or the print media, scientists must know how to respond. The **inverted pyramid** (see the Telling a story section) can be very helpful here.

A good journalist in general will do everything to put the interviewee at ease. However, the scientist can **often feel intimidated**. The most common concerns are: to **be misunderstood**, to find scientific errors in the product of the interview (article, video, etc.) and perhaps even be afraid for your reputation.