

# SIX VIRTUES FOR THE REFLECTIVE SCIENCE COMMUNICATION PRACTITIONER

Connect your perspective and practice to the diverse ways in which citizens make sense of science

In the current digitalised, politicised, commercialised, and fragmented science communication ecosystem, practitioners are confronted with many challenges. How to navigate difficult interactions with science sceptics online? How to embrace uncertainty that is inherent to science? And how to accompany for the personal and contextual ways in which citizens make sense of science?



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Explainer video



## VIRTUE 1:

Open-up hierarchies between scientific experts and citizens



## VIRTUE 2:

Critically reflect on your assumptions and worldviews, and explore how this influences your science communication practice



## VIRTUE 3:

Open-up your mind to a multitude of perspectives on science, and make the diversity explicit in your science communication activities



## VIRTUE 4:

Listen, find common ground, and focus on the relational aspect of 'doing' science communication



## VIRTUE 5:

Humility: Acknowledge the limits of knowledge and embrace uncertainty



## VIRTUE 6:

What if... You created science communication output together with your audience?

The rise of social media, fragmentation and commercialisation of science communication platforms, the increasing sensational value of scientific information, politicisation of science in public debates and science scepticism have changed how practitioners experience and practice their work. They do not know their audience, because online publics are anonymous and rarely provide feedback. It is hard to deal with increased polarisation, negativity, and science scepticism. And people make sense of science on basis of their personal situation, experiences, and social context.

How can - and should - science communication practitioners respond to these challenges? It is important for practitioners to rethink and reflect on the perspective they take on science, their audience and, consequently, the activities they undertake to facilitate and manage public conversations on science. Reflective practice is valuable for practitioners who need to deal with complex and fast-changing communication environments, where

scientific information not always provides a univocal answer nor certainty. Reflective practitioners are professionals who are aware of how their science communication activities are influenced by their worldviews, their ideologies, and the institutions or economic and political conditions they are surrounded with. This helps learning about what happened in certain situations and how to transform to a meaningful practice.

**Single-loop learning** = becoming aware of the problem or challenge in the situation.



*What is happening here?  
What do I experience?  
What is the situation?*

**Double-loop learning** = understanding underlying factors or mechanisms.

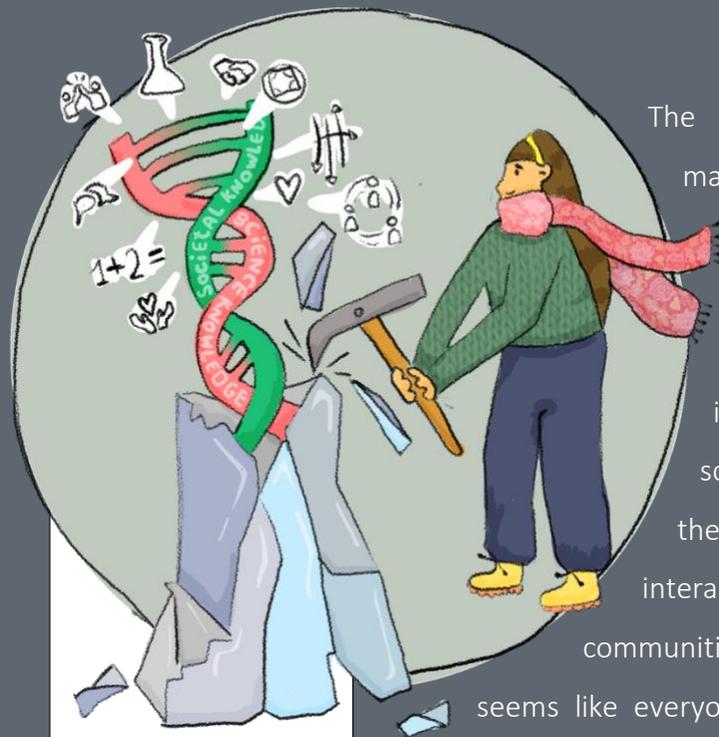


*Why is this happening?  
Why do I act in this way?  
What are the underlying*



*How do I know that I deployed the  
right activity, or chose the right tone?  
How can I reorient my perspective or  
practice; and towards what?*

**Triple-loop learning** = a process wherein existing frames of thought are 'reopened', as to change the practice or undertaken activities more fundamentally.



## VIRTUE 1:

Open-up hierarchies between scientific experts and citizens

The Covid-19 pandemic has made it clear that society no longer just takes on what science has to say and raised the importance once again for scientists to come out of their ivory towers and interact with people and communities in society. Now that it seems like everyone on the Internet is a (scientific) expert, scientific information is commercialised, and misinformation is generated and spread, scientists and science communicators are often quick to jump into a nowadays popular narrative and attitude of 'defending' science to sceptics and 'combating' misinformation. Herein, the presumption of many is that "only science can provide reliable, verified facts for the public debate". However, during the Covid-19 pandemic, we were increasingly confronted with the ambiguities of science, as scientists disagreed on the scientific facts in public, and science communicators pointed to the

relevance of contextual and experiential knowledge. It became clear that next to scientific information, also political, economic, ethical, cultural and social dimensions play a crucial role in how scientific information is interpreted.

These insights have implications for the way in which science communicators practice their work as well. As science communicators, we need to recognise that our own worldviews and contexts influence the information we find, how we interpret it, and what information we deem trustworthy or 'the objective truth'. Herein, becoming bridgers between scientific information and experiential knowledge within society is essential to facilitate constructive public discussions on science. Science communicators can do this by 'breaking the ice' between scientific authorities and citizens and focus on facilitating personal bonds.

*"You have to explain and substantiate where your argument comes from. People trust authority. We need to be aware of this and act responsibly. It is not enough to say something is true 'because you are the expert'. You must explain your argument in terms of 'why' something is true, and 'why' you think this is true. In my communication activities, when I did this, there was a lot of laughter, a lot of self-criticism. That kind of broke the ice. People feel really comfortable when you tear down the wall that separates scientific experts from citizens."*



Online, we are confronted with diverse perspectives, including science sceptics who have ‘opinions’ about scientific information. Practitioners respond to them by explaining how the scientific facts are truths. At the same time, we know that people make sense of science based on their personal situation and social context, which includes people’s values, emotions, worldviews, their surrounding community and culture, and economic position.

## VIRTUE 2:

Critically reflect on your assumptions and worldviews, and explore how this influences your science communication practice

It is important to challenge the persistent thought that a lack of knowledge is why we disagree about the scientific facts. Reflective practice is essential here.

What assumptions do I make about my audience?  
 What am I not seeing? With whom am I not interacting? Should I engage them differently? The following example illustrates the initial reflections of

an immunologist at a radio show on anti-vaxxers: *“I found their views infuriating in light of a monumental amount of scientific data, showing that vaccines work and that they are safe.”*

The immunologist reflected on his own assumptions and beliefs after each show. He discovered that his medical background was influencing his statements in the show heavily. He was not able anymore to be open-up and consider a variety of relevant other information or perspectives on science. He was dismissive of the legitimate worries that other people had. Accordingly, he changed his practice, from convincing his audience by transmitting facts in his radio show, to communicating out of empathy and understanding, and incorporating emotions and personal reflections:

*“Reflecting on my own worldview and perspective on science, ensures that I am more empathetic to people’s valid concerns. I think it is better to assume that your “invisible” audience does have legitimate concerns, rather than just bombarding them with more facts about vaccines. I still feel deeply frustrated by extreme anti-vax views, but I am far more understanding of the underlying emotions and personal situations of people. This helps me with deploying a different approach to my communication practice. I think if someone is on the fence about vaccines, then approaching them empathetically is crucial. I think it’s really harmful and risks further polarisation to just tell people that they are wrong, and throw facts and judgement at them.”*



### VIRTUE 3:

Open-up your mind to a multitude of perspectives on science, and make the diversity explicit in your science communication activities

important. Being prepared to revise perspectives and actions based on new information and insights helps others to plunge into the deep, and be more willing to change their mind in light of other perspectives and new information.

The following example showcases how a communicating scientist with her own podcast came to the realisation that she had blindspots in the many perspectives that exist with regards to scientific information. Together with the listeners of

Not only is it important that science communication practitioners are open and respectful to a wide range of evidence, sources, new information and perspectives; by displaying such an attitude it also helps receivers to engage with these outputs in an open and respectful way. Therefore, making explicit the broad range of perspectives, also when those might counter your own perspective or beliefs, is

her show, and friends and family members, she tried to gather as many different perspectives as she could find, and discussed them openly in her podcast. It is interesting to read how she created space for emotions and the personal situations of pregnant women to enter the conversation about Covid-19 vaccines. Opening-up about the many different perspectives 'out there', helped her to engage with her audiences in a new way.

*"I decided to send around a short questionnaire via Instagram. I asked my audience what they thought of the podcast, how it made them feel. I got a lot of responses from pregnant women who were terrified of the information I put out, even when I mentioned vaccines were safe to them. I realised that the topic itself made them anxious. Now, I try to not go straight to the scientific information and first acknowledge the fear people might have. And then the reasons for how and why certain conspiracies about vaccines and infertility emerge."*

She highlighted how filling her blindspots helped engaging in new ways:

*"I could have easily been dismissive of vaccine hesitant people and let my emotions lead the discussion, whereas now that I have opened-up my mind to more perspectives on science, I always try to approach my practice from a more emotional point of departure. The frustration that many scientists and science communicators feel, bleed out into the interaction. I think that risks further alienating audiences."*



When confronted with people that have very different worldview, emotions, and values regarding scientific information compared to your own perspective, it is very easy to become dismissive of their opinions. We close our ears and close our minds. It makes us not listen anymore to the - often personal, experiential or emotional - reasons that lay underneath people's words. It shuts down our curiosity to learn where the other is

coming from. Listening in communication activities, therefore, sounds easier said than done.

#### VIRTUE 4:

Listen, find common ground, and focus on the relational aspect of 'doing' science communication

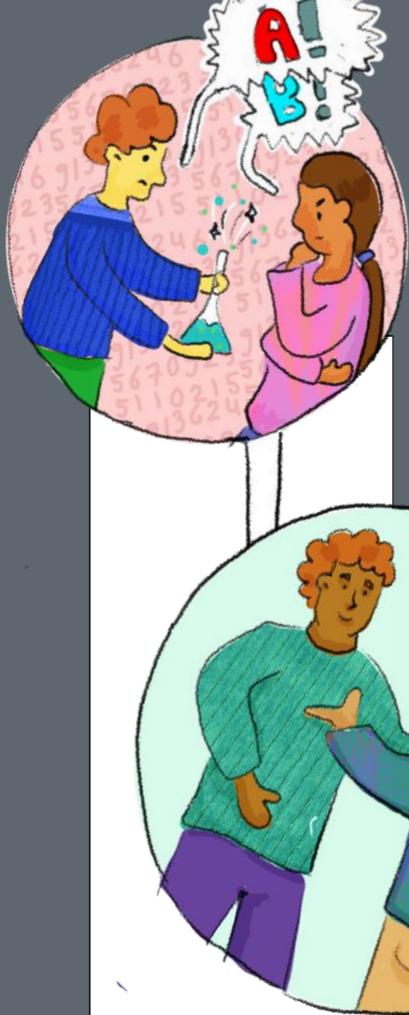
By showcasing the following example of a PhD candidate who works for the faculty of Religion and Theology, we want to make the case for sparking your curiosity in the other. Why is this happening, why is this person saying these things? Why do they act in this way, and why do I respond to them the way I do?

By trying to suspend your initial closing off, and by engaging in an interaction wherein you try to figure out

the answers to these questions *together*, you might find that you actually have more in common with 'the other' than you would think at first. The research group this PhD candidate works for, has the primary goal of reaching underserved and hard-to-reach audiences. Her research focuses on how to bridge the seemingly different worlds of science and religion. In her conversations, she always tries to search for common ground with people who have different worldviews, experiences, and values regarding science.

*"Part of my own research is also to simply map out where people's concerns originate from. What keeps them busy? Where do the doubts come from? An important first step for me is to listen, to suspend my judgement and to map out their skepticism. For example, I am a mother. I firmly believe that climate change is real. When I talk to climate sceptics, I relate to the worry about the future for my child. It helps to start the conversation in that way, so not primarily from my role as an academic, but as a concerned mother."*

This communicating scientist could shift the conversation from disagreeing about the scientific facts, to a conversation wherein both parties listen to what the other is *really* telling them. This makes it easier to find what values are at stake, what implications science has on daily lives of people, and where to seek for solutions - next to disagreeing about whether the scientific information on the table is true or not.



We live in uncertain times. Citizens had to make sense of the risks of the pandemic and the impact of measurements for their daily life, and at the same time, were overwhelmed with scientific information. Often, this information was incomplete, not fitting for the personal situation people found themselves in, ambiguous and sometimes even contradicting. On top of this, we experienced an increased conversation about misinformation - which made it hard for people to establish what information was true and what not.

enormously difficult for citizens to make sense of science. Many have responded to this experienced uncertainty about scientific information by providing even more information, displaying a degree of certainty that was often immediately questioned in public. Journalists and other science communicators often find it difficult to communicate uncertainty, and therefore tend to ignore it in their science communication outputs. But does providing this type of certainty provide us with feelings of relief?

Embracing uncertainties is a point of strength, rather than a weakness that should be avoided in public conversations on science. We need science communication practices that allow for open conversations on the ambiguities, uncertainties, and complexities inherent to science, and with a wide diversity of publics. Herein, it is important to be open about the limits and boundaries of science, and help audiences embrace and cope with uncertainty - instead of pretending that uncertainty does not exist.

## VIRTUE 5:

**Humility:**  
Acknowledge the limits of knowledge and embrace uncertainty

*"I had a moment of confusion when in the beginning they said that masks were not obligatory and that masks wouldn't help. Then, from one day to the next, they said 'ok masks actually help'. Did they know before? What should I do now?"*

The prevailing complexity and uncertainty that became explicit in the pandemic has made it

Our Rethinkerspace member from Serbia, who works as a communications manager at a research institute, described how he discusses these notions:

*"The pandemic has shown that people are being totally freaked-out that scientists have different opinions. They think: 'Why do scientists say different things?!' But this is the scientific process. That you try some things, you find evidence for your hypothesis."*



Many science communication practitioners mention the difficulty of communicating to an audience that is unknown. Online, people are nothing but profile pictures and a tag. Really knowing what these people need from science scicomm outputs is hard to find out.

This leaves many science communicators to question if their output reaches their audience and if it has the intended effect.

A solution here can be to create your science communication output together with your audience. This can be done in many ways, for example, simply by writing an article together with the audience you aim to reach, by asking your audience to provide input to the list of questions you want to ask an expert of your radio show, or by sending out questionnaires that asks for feedback

**VIRTUE 6:**

What if... You created science communication output together with your audience?

on the output you have send out. By creating something together, your own perspective and that of 'the other' is constantly challenged and addressed *in the moment*. This makes the science communication output more attentive to change accordingly to what different audiences and different situations require.

What would happen if you would co-produce your science communication activity or output together with an audience that is unknown to you? Or an audience that you struggle to reach?

Instinctively, it is not hard to imagine that the output would include a different tone and language. You would be confronted with new jargon, or voice an assumption you did not know you had, and that could be challenged by the audience you make the product with. In short, it is a way to get to know the audience you want to reach, and at the same time align your perspective and practice to what this audience requires. It is an opportunity to make your own work more diverse and attentive to diversity, ambiguities, uncertainty, differing perspectives and conflict.



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