Open Scientist Handbook • OSH

Ten things every open-science culture-change agent needs to know about

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Here are the 10 things you need to know about to be an open-science culture-change agent. Pick the ones you want to challenge yourself to master.

1. Open science culture starts with the logic of demand sharing:

This is the same logic used to teach science in classrooms: knowledge gains value when it is shared. The more it is shared the more it is worth; the faster it is shared the greater its impact; the wider it is shared the better the chance that someone else will improve upon it, and share this improvement back with you.

2. Intellectual humility is integral to open science:

“The humility of scientific genius is not simply culturally appropriate but results from the realization that scientific advance involves the collaboration of past and present generations” (Merton 1973).

Here are some aspects of humility and reasons why this is a great fit with open science, and a powerful agent against bullshit prestige (Moore, et al. 2017) and narcissism (Lemaitre 2015) in the academy. Tangney (2000) constructed a working definition of humility, one that is not simply philosophical, but also informed by social and interpersonal circumstances. This definition rejects humility as a psychological weakness, instead, humility demonstrates a range of abilities highly valuable in the conduct of science. According to Tangney, humility has five elements:

- A. the ability to acknowledge mistakes and shortcomings;
- B. openness to perspective and change;

- C. an accurate view of the self's strengths;
- D. ability to acknowledge and experience life outside the direct consciousness of the self; and,
- E. the ability to appreciate the worth of all things.

As an open scientist (or just someone who wants to do science really well), you might consider how to develop all of these capabilities. You acknowledge your mistakes in order to learn new facts; you broaden your perspectives on your topic to achieve a wider level of understanding; you evaluate your own skills to discover where you must improve your methods; you journey into the unknowns in your field to stretch the envelope of our knowledge; and you reserve judgement on the work of others long enough to fully grasp their meanings. Carl Sagan notes:

“In science it often happens that scientists say, ‘You know that’s a really good argument; my position is mistaken,’ and then they would actually change their minds and you never hear that old view from them again. They really do it. It doesn't happen as often as it should, because scientists are human and change is sometimes painful. But it happens every day. I cannot recall the last time something like that happened in politics or religion” (Sagan 1987).

You also give others more attention and respect. This does not mean you respect yourself any less. You just learn to step around your ego to see others and their work as more valuable. Recent research has found that intellectually humble individuals may acquire new knowledge better than others (Krumrei-Mancuso, et al. 2019). Also note: “only humility can navigate complexity” (Fred Kofman <<http://www.youtube.com/watch?v=80vYx7ufzZI&feature=relmfu>> Accessed September 14, 2019).

Humility helps you learn. Humility enables your research. You are a scientist: you have the freedom to be humble about it. It's not modesty. Nobody is asking you to be modest. Think of it more as “hum-ability”.

In Aikido, humility becomes hum-ability. Open science is the same.

3. *Intentional kindness is the platform for open science culture:*

“The power of happiness, kindness and humility in the competitive academic environment is underrated, but I firmly believe that they are a force for change for the good of scientific practice. In my opinion, widespread application of these principles could vastly improve the quality of life of scientists and university professors worldwide” (Maestre 2018).

Kindness in open science (and elsewhere) begins with intention. Intentions are themselves colored by culture. Culture provides a layer of shared meaning/learning that helps us discover and interpret and map shared meaning as *intended*. The same conversation with different intentions can be a kind, caring dialogue, or it can be a

cruel interrogation. The cultural values you bring to your open science organization can assemble the meanings that add clear intentions to acts of kindness, and to the generosity that all science requires. Just as some institutional cultures today—and inside the academy—support bullying and demeaning actions (NAS et al. 2018). Note: kindness does not mean weakness.

Shared kindness is a platform that lifts open science up to new potentials for sharing knowledge. In the academy, kindness is a radical form of courage. “Everyone here is smart. If you want to truly distinguish yourself: be kind” (From Anne Galloway: <<https://twitter.com/annegalloway/status/438412389319319552>>).

Kindness flows from a concern for the whole science community and the planet, not just your own lab or students. The best teachers are already kind in their classrooms. Bring that kindness to your research too. Don’t be that one asshole who makes others stop sharing. Kindness is not optional.

4. Open science means really open:

Open science may have started by opening up paywalled publication workflows, but it only succeeds when *open* extends back through the whole research process. Open is a manner of doing research that seeks to reveal as much of itself as it can or might, to promote shared knowing and reproducibility. Open is a transparently governed and democratic workplace in your organization. Open is open across the planet.

5. Open-science culture change starts with you:

Now is the time for you to lead your own open-science cultural change project. When you look around, you might be dismayed by the (dead) weight of organizational culture in your workplace. You can start small, and you can recruit others. The goal is to get back to the way science is meant to be pursued: infinite play against intractable unknowns, to squeeze new knowledge from observations and information.

Remember first that leadership means humble conversations (Schein 2013), fear-free interactions (Edmonson 2019), and democratic participation. You provide the compass—an informed open-science perspective—not a map. You and your colleagues are on a new learning curve toward a workplace where the only fear you find is the joyful thrill of playing with nature and data to unlock new insights. Open science needs you to find this kind of leadership inside and bring it to the academy.

6. Open science culture is learned:

You learn culture just like you do science, only you started early on, and without knowing this. That's what this handbook is for. Disney and the Boy Scouts have been conscious, intentional, culture-learning organizations for decades. So too has the US Navy (for example), and your elementary school. This Handbook and hundreds of web resources are available help you discover more about open science and how to be an open scientist.

Culture is not just some subliminal vibe that you soaked up somehow (although you did a lot of culture learning really early on, and it seems like it was just soaked up). You are an adult. You are now responsible for your cultural behaviors. You can bring your focused intention and behavioral skilling to the goal of becoming more open each day. You succeed as an open scientist (and, in some fashion, as a person) by being more open today than you were yesterday.

7. Open science culture is an on-going conversation:

Make it a point to talk and question others about open science culture. The more people who talk the talk, walk the walk, and share what they value most, the better science will become. As John Wilbanks once said: “the opposite of ‘open’ is not shut. The opposite to open is broken.” Share your open science practices and stories. Keep talking with one another as you build common agreements.

8. Open science culture must be transmitted:

Teach your students to be open scientists. Talk to you children about how science really works in the open. Talk to their science teachers about the benefits of open science. Be an open-science mom or dad. Don't have kids? Make sure the freshmen in your class know the difference between old-science and open science. The next generation of open scientists will need to assemble their own cultures. You can give them a head start.

9. Open science means open to all:

Not just to the “Republic of Science,” to the long-tail and beyond. Publication works when anyone on the planet can find your knowledge and share theirs with you. Do not worry; technology will help provide filters to keep you from drowning in information you do not need. Technology is one side of being open. Culture is the other side. The entire planet gets into the act at some point.

10. Open science culture will become your culture too:

You get to grow your own personal virtues aligned with the shared virtues you use in your work. You get to add passion (and nuance too) to how you realize your own cultural flavors within your various social/workplace groups. Open science wants as much of you as you care to bring to it. You can take and carry away as much open science culture as works for you. You can own your unique style of open science. Grow it. Show it off. Add new thoughts to the mix. Make a ruckus with it.

Fitting into the norms of your open science workplace

Organizations that grow their own cultural intentions and shared purpose demand more cultural/personal alignment of their members than those that do not. This is a cultural “bargain” the organization makes with its members/employees. This does not mean that the organization is oppressive, but it can feel that way if the member does not also benefit from this bargain.

As a student or faculty/staff, when you join a team that holds shared cultural norms, you are forced to reexamine your own cultural norms:

1. You can fit the organization’s norms into your own: learn new intentions and meaning that are in alignment with those of the organization—grow into the organization’s shared values and begin to care about these as you do your own values; or,
2. You can argue for different shared norms that are more aligned with the ones you hold as an individual. Try to convince others that different values are better. Should your arguments fail, you may need to either quit or be ready to get fired—or admit you were wrong and fit these norms into your life, or;
3. You can pretend to celebrate the organization’s norms and continue in silence to operate through your own orthogonal “principles” (until you get found out). The last choice is corrosive to the organization’s purpose and culture. You are better off working somewhere else. They are better off if you leave.

Basically, when it comes to organizational culture, you can either fit in, add your own ideas to the mix, or pretend to fit in. Pretending to fit in works against the organization. Fitting in without reflection limits your ability to own the culture. So, step up and challenge any norm that doesn’t seem optimal for you. If your organizational culture doesn’t let you add your voice, it doesn’t deserve your respect. However, if you learn you cannot fully participate in the practices expected of team

members, you might want to work elsewhere. Norms and principles are open to interpretation in their practice, and enable skilling and virtuosity, like any cultural practice. The idea that you need to “be more like us” to express your own individual principles may seem counterintuitive. When you are reflexively engaged in the ongoing conversation about your organizational culture, you are creating the meaning for “like us”. You own your own part of this. You can belong, and not just “fit in.”

Bibliography: Open Scientist Handbook References