Open Scientist Handbook • OSH

Idea Gardening for the Academy

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You need to plant it for your idea to grow

Open science means leaving the idea desert for the idea garden

Most often, new discoveries and new learning come when one is open to serendipity, when one welcomes novelties and anomalies, and then tries to incorporate those outlying results into the broader field of knowledge. As Isaac Asimov said, “The most exciting phrase to hear in science, the one that heralds new discoveries, is not “Eureka!” but “That’s funny!”” (Brown 2009).

Ideas in the academy are another victim of the logic of arbitrary scarcity. They are also collateral damage in the proximity to the neoliberal, start-up economy. The academy should be an idea hot-house, instead we have an idea desert. The cultural shift to open science will be final when ideas flow across the globe like pinot at a faculty party.

Common sense on idea sharing

Turn your ideas into citations

Like talk, ideas are cheap. How many research ideas do you have in an hour? In a day? In a week? Probably enough that you really wouldn't take time to even jot them down. There are the ideas that seek to connect your current work to new hypotheses. Ideas about alternative methods, or new data sources. So many ideas crowd into your thoughts:

- Ideas you have while listening to a seminar talk outside your field, where you are curious how something you know might be of use or interest;
- Ideas on where your discipline is headed, and those large-scale issues that might drive agency agendas;
- Ideas that pop up when you read that new journal article (any article that does not give you new ideas is a waste of your time);
- Ideas about what your graduate students might want to pursue to start their own infinite play in science;
- Ideas you put into that NSF proposal you submitted last month;
- Ideas.... Well; you get the idea...
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Face it: your professional life is brimming with ideas; that's pretty much the point. And yes, you don't want or need to share them all. Over time, you will get better at triaging the insights that occur to you. Ideas are the starting line for infinite play (See: [Learning infinite science play](#)). There are about ten million science researchers on the planet. Each of you wakes up to a new day filled with new ideas. Almost all of you keep most of your ideas in your head until they are forgotten, replaced with other ideas, similarly forgotten, and a couple insights, carefully hidden in a notebook or on a laptop. We live in a world where there is no lack of abundance of good ideas in science. We also live in a world with a global internet. Why not connect these two? That's an idea.

Note: thoughts are not ideas. Thoughts are just thoughts; you have a steady stream of these, most of which you would not share without first being injected with Sodium thiopental. Also, nobody wants to hear your thoughts.

When asking scholars about their ideas, some common notions arise:

1.) Even though that idea you just had while brushing your teeth might seem unremarkable to your own work and aims, the only way for this to engage the adjacent possible of someone else's research is for you to share it. Some time in the near future, you will be able to pick up your phone and speak your idea into an online service that can push this into a global science conversation. Then you can rinse the toothpaste from your mouth. "(W)e can be sure that accidents will continue to happen and, with human minds better prepared than ever before, we can expect these accidents to be turned into discoveries, marvelous beyond our imagination, through serendipity" (Roberts 1989).

Great ideas can happen any time, anywhere. And none of them were recognized as "great" at the time. Histories of science record numerous events where ideas that informed major scientific breakthroughs began as simple thoughts that occurred on buses, in showers, while walking or waking, and, most regularly, during informal conversations away from the laboratory (See: Copeland 2019; Roberts 1989).

Discoveries made by mistake are commonly referred to as occasions of scientific serendipity: looking for X in the lab, and finding Y instead. "Serendipity is built out of happy accidents, to be sure, but what makes them happy is the fact that the discovery you've made is meaningful to you. It completes a hunch, or opens up a door in the adjacent possible that you had overlooked" (Johnson 2011). Yaqub (2018) outlines several different types of scientific serendipity that your next idea might trigger.

2.) Almost all of ideas you produce throughout the day, you dismiss as worthless. The few you write down to remember you cherish as diamonds. And yet, while the former are of little value to you at this moment, many of the ideas you have might be insights of some significance to another scholar. These ideas are products of your own genius, created without effort, because of the enormous effort you've already made through

your learning. Don't get proud here, there are millions of researchers with similar talents, each one focussed on their own research problems. Each one's personal variety of sagacity makes their ideas different; and this difference is the key to the new information they hold for others.

What about those ideas you cherish? Those precious nuggets you hoard like Smaug in his cave? Give them away. It's a practice of the open-science Demand Sharing economy. You let others have what is most valuable to you. This generosity encourages them to do likewise. When the smartest person in the room is the room, filling this room with the best ideas opens up floodgates to creativity and innovation. The more precious your ideas are to you, the more likely others will find them of value to borrow and reuse. When you add these to the conversation, you are also announcing your authorship of them. They are your gift to the academy that supports your own research. Others might add new insights to your idea enlarging and expanding its value. Only it's not yours any more, it's a part of an idea commons. And don't worry. You'll have plenty of new ideas to give away.

3.) Your idea needs friends to get great. An idea on its own in your head is like a seed in a seed packet. It needs ground to grow, it needs to join into conversations. Until now, these conversations happened in your lab or at a workshop. "(M)ost important ideas emerged during regular lab meetings, where a dozen or so researchers would gather and informally present and discuss their latest work.... the ground zero of innovation was not the microscope. It was the conference table" (Johnson 2011). Today, those conversations can and, perhaps, must happen at a much larger, online, table (See: [Science happens elsewhere](#)).

You may be mistaken about science idea sharing in your career

1. You think it's a self-defeating move to openly share your ideas. However, you already can share almost all your important ideas with a win-win outcome; and,
2. Funding agencies are the least efficient organizations when it comes to gathering important ideas. That RFI you just filled out is a good example.
3. Idea farming is a fringe notion, you think. It turns out that hundreds of corporations and public government organizations are actively doing this right now.

These misconceptions will also change when a culture of demand-sharing open-science is implemented across the academy. Let's explore further.

You are ready to share your ideas anyhow

Right now, today, a lot of the ideas you have that are somewhat relevant to your work, you would share if this were easy enough to do. You have any number of potential solutions for a wide range of issues in your area of research; solutions you have no intention of pursuing, but would really like to have solved, by someone, and today, if possible. For you, these are anti-rivalrous ideas. You don't mind if someone else, or anyone else, takes them to work on. Guess what, your idea might be a catalyst for someone else's research; just the idea that leads them to a breakthrough that will make your work easier tomorrow. If there were an idea farm on the web, you could certainly spend ten minutes a day contributing smart ideas for others to work on. At the same time, you can lard the idea farm with questions you need answers to, and pull these from the mix when they show up. The small remainder of your ideas are those you and your team might want to propose to accomplish, given funding. So you tuck these away. And even when your research proposal is being evaluated, you worry that someone in that process will grab them for their own proposal (after down-grading your proposal); such is the state of the academy today. Open science sharing would allow you to give away all your ideas, and still get recognition for them. The problem isn't greed, it's the culture of the academy that needs to change.

Almost all solution ideas are non-rivalrous for any one scientist

You already have no reason to not share most of your ideas

The RFI paradox: scientists offer information that seeds their research

Every so often a funding agency/foundation asks for feedback: they want your ideas about priorities for the discipline's future research. Ideally they would get a vast range of information from the thousands of scientists on their mailing lists. But realistically, they only get granules of ideas that are linked tightly to the goals of the teams/labs that will be angling for funding. "What should we focus on?" they ask. "Me," you answer. Not so directly, but by the content you supply.

Idea-gathering by funders is perhaps the least effective way to assemble knowledge about science. One major private foundation recently discovered, when it opened up an idea-farming platform to gather ideas that almost every idea came with a request for funding. This is not the fault of the researchers. They have five-hundred words to say what is most important for their discipline. What is most important for their discipline, in their perspective, is to support an arena of research in which the researcher has already invested.

Problem ideas for funder RFIs focused at possible funding opportunities

So many ideas will NOT be collected by a funder RFI

An open platform for your ideas to procreate

What if every day, say at the end of the work day, or after a beer, or in the morning after that mug of coffee, each scientist on the planet hopped online and added one idea to the global idea-farm platform (with some tags to help discovery)? What if ten-percent of them decided to add lots of ideas every month (the power-law curve suggests this is inevitable)? After a single year, there would be more than three billion ideas on the platform. Lots of overlap and similarities, but a whole lot of variety and difference too; coming from the minds of people who woke up in a hundred different nations. Each idea is time-stamped, with a permanent ID, and linked to its author. Every entry takes a minute or two to accomplish. A phone app lets you talk your idea into the mix.

Want to add a crazy good idea, or worried an idea might seem naive? Use your personal alias. Want to add a comment or a question to someone else's idea? Go ahead. Feeling paranoid? Lock your proposal insight into an embargoed, timestamped vault on the platform. Open this later. Then try to be less paranoid.

Demand sharing means giving what is most valuable to you to the academy. This is a value and a norm for open science. Open science initiatives are building open platforms for a variety of internet services. The platform for open idea farming may not be here now, but can be built with a bit of funding and the right home.

Link a billion ideas to a million scientists across the planet, and you can find the select few of them who happen to be considering precisely the same problematic you are puzzling through today. Then you can build collaboratives to explore these together. Thinking of writing a grant proposal? Mine the combined idea farm of the planet to make your proposal ideas better and more up-to-date; and then share these new ideas online (you can embargo them if you are worried). Your graduate students will be looking to see where their ideas are shared elsewhere, and how they can push their own infinite play into new ground. You can mine the platform to sharpen your paper or your poster. What better way to learn new things when you've already finished school, than to access the ideas of your peers? Network effects not only apply to people, but also to ideas. Put a lot of ideas into a shared, networked (databased, searchable, with discovery tools) environment, and innovation will blossom. This environment will become a place where, [as Matt Ridley says](#), "ideas go to have sex."

ImagiNative working on the next great idea....

Become an ImagiNative

What if one of your ideas (you had this in the shower, and spoke it into your phone app over coffee) were picked up by a lab in another county, on another continent, and used to create a new theory that rocked your discipline; and in the paper that announced this theory, your idea was cited as a key element? How rewarding would that be? How many times might this happen across the planet in an open-innovation environment? And what if you searched the platform and found an idea from an early-career scientist in Sri Lanka that gave you a new insight into your current work, so you cited them in your next paper. How great for them.

There is a whole lot of “elsewhere” out there in the global Republic of Science. You need to be in touch with all these elsewhere ideas and with the people thinking them who also share your disciplinary/theoretical neighborhood. As Shirky noted, “We also have to account for opportunity, ways of actually taking advantage of our ability to participate in concert where we previously consumed alone” (2010). You need to become an ImagiNative; open to new modes of collective knowing. And your lab, your school, your university needs to support open innovation (instead of patents; see: [Against Patents in the Academy](#)).

“Innovation happens everywhere, but there is simply more elsewhere than here. Silly as it sounds, this is the brutal truth: Regardless of how smart, creative, and

innovative you believe your organization is, there are more smart, creative, and innovative people outside your organization than inside” (Goldman and Gabriel 2005).

One of the major changes for corporate R&D in the past twenty years is “open innovation” (Johnson 2011). This has become a clarion call for the academy too (Europäische Kommission 2016). Sharing ideas and insights on an open platform transforms the various elsewheres of the academy into new opportunities for open innovation. Dozens of “innovation management” platforms today help global corporations mine the ideas of their wide-spread workforce and their customers.

Open Scientists share objects to gain network effects for their work

“Because we have to coordinate with one another to get anything out of our shared free time and talents, using cognitive surplus isn’t just about accumulating individual preferences. The culture of the various groups of users matters enormously for what they expect of one another and how they work together. The culture in turn will determine how much of the value that we get out of the cognitive surplus will be merely communal (enjoyed by the participants, but not of much use for society at large) and how much of it will be civic.” (Shirky 2010)

Building on a civic culture of sharing, open science creates new value from every object (idea, data, method, software, results) that is openly shared. Some of this new value accrues to the scientist who shares, some goes to the benefit of all scientists working in the same research arena who reuse this object, and some goes to scientists who can open up new research from the collective resource that this object now enhances. This last value is the ultimate promise of open science: a shared surplus of research objects that can be openly mixed, mined, and melded into new, synthetic knowledge. McKiernan (et al. 2016), demonstrates the advantages of open sharing for citations, impacts, careers, etc. What the open scientist does to increase the holdings

of the open corpus in their field adds a civic choice to these advantages. Growing the open research ecosystem helps every scientist on the planet.

Adding a new bit of research findings and process to an open repository is as easy (or easier) than submitting this to a closed collection (such as a for-profit publisher). However, open sharing scales better, particularly when it uses open standards-based platforms, and it is less fragile, as it can be migrated to new platforms and spread across multiple locations. Openness adds to discoverability and access, and contributes to reproducibility.

Even as the value of, say, a telephone exchange, increases with each new telephone connection, the addition of a new data set, or a null result paper, or a specific finding builds numerous interconnections with the rest of the corpus. These interconnections (and their “[network effects](#)”) can lead to new knowledge, and they can serve as a mirror and a measure to reveal how each new bit of content solves (or critiques) a specific issue, and also potential problems with the newly added object. Rapid, open review opportunities arise. So too does rapid recognition and opportunities for new collaborations.

A lot of these new interconnections will take place on the internet at a planetary scale. The network effects of open science build capacity for the free movement of objects and ideas. This capacity—the almost instant global access to science products on the open web—is anathema to markets that need to claim ownership and restrict access in order to capture profits from these. Distributed data protocols (e.g., the [Interplanetary File System](#)) and other emergent technologies will reduce the cost of hosting science objects to a near zero margin. Open licenses make sharing science knowledge durable and its reuse legal.

As [Cameron Neylon](#) said at the metrics breakout of the Beyond the PDF conference some years ago, *reuse is THE metric*. Reuse reveals and confirms the advantage that open sharing has over current, market-based, practices. Reuse validates the work of the scientist who contributed to the research ecosystem. Reuse captures more of the inherent value of the original discovery and accelerates knowledge growth. Open science is a science knowledge and data reuse accelerator. Its network effects help make reuse available, and, in time, inevitable.

Bibliography: Open Scientist Handbook References