The brave new worlds of crowdfunding science

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Crowdfunding, goes beyond the reach of traditional funding

Citizen's interest in research is gaining momentum. In some cases, it translates as a direct involvement of citizens in research projects. In other cases, initiatives allowing citizens' participation in science policy through Science Shops—a concept originated in the Netherlands in the 1970s—has flourished more recently in Germany alongside other initiatives. Similar ones also exist in France. But taking part in research—which sometimes involves mundane tasks—or deciding where the research priorities lie do not satisfy everyone.

Some people would rather fund research directly. As a result, crowfunding for research is maturing. No longer the domain of quirky promises—say, to make a potato salad—crowdfunding now specifically caters for science projects. Several websites are going from strength to strength, including Europe-wide Public Lab, Science Starter in Germany, Walacea in the UK and Experiment in the USA, to name only a few.

A defining aspect of Science 2.0, crowdfunding is increasingly considered as an alternative funding source for research projects. But this raises the question of what traditional government-financed funders will do in response to the growth in crowdfunders. Will they soon be in competition for scientists' services? Or could each side's funding models evolve so that the two are complementary to each other, learning and adopting better practices for better science?

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Bottom-up approach

Crowdfunding is now big business. A framework report from the European Crowdfunding Network estimates that €2.2 billion will be raised globally by crowdfunding platforms in 2012—up 80% from €1.2 billion in 2011. And considering all types of crowdfunding, Europe raised around more than €300 million; that is one third of the world market in 2011.

At these rates of increase, some believe, it will not be long before total crowdfunding amounts in science approach those offered by the research councils of some European states. It is notable too, that the same report states that "European, national and local legislators and policy makers should join forces to establish crowdfunding-enabling legislation in Europe."

This points to the involvement of traditional funders. "There is lots of potential for country-based traditional funders to work with the emerging crowdfunding organisations," says Stephan Kuster, head of policy at Science Europe, an association of 50 European research funding and performing organisations based in Brussels, Belgium.

However, he adds that it is probably too soon for policy-makers to begin formulating strategies for funders to work with crowdfunders. "We are looking at this within the broader landscape of Open Science or Science 2.0," he says. "We are not developing strategies or policies at this time. What crowdfunding needs now is not top-down policies, but the space to grow and really show its benefits for specific types of science and societal benefit."

Unconventional studies

One of the reasons that crowdfunding platforms have flourished, is their ability to handle risk, according to Denny Luan, co-founder of Experiment. "What [these large funders] can't do well is stomach risk," he says. He adds: "This is plainly evident if you look at recent trends of what's getting funded: lower-risk, longer term projects, given to older scientists. It's inefficient, risk-averse, and often times political."

However, he says because of crowdfunding platforms interest and curiosity are growing, costs are falling, and the future of science is bright. "We're hoping to create something that [makes it possible] for more independent science to be done and shared openly."

As a result, crowdfunding projects are able to fund science that might be too controversial for major funders to back, like with powerful hallucinogen LSD for example. The first human brain imaging study to investigate LSD and creativity will be performed by scientists from Imperial college London, UK, using crowdfunding platform Walacea. The public call for crowd funds was an instant hit, reaching its goal of £25,000 (€34,000) in just 48 hours and going on to double it. They had 1,628 backers from more than 50 countries, with people from almost every European country pitching in donations from £5 to 10,000.

What makes this study even more remarkable is that the team that will perform the LSD experiments undertake similar studies funded by regular, government-funded agencies, in this case the UK's Medical Research Council. "Colleagues are watching with interest," says Neuropharmacologist David Nutt at Imperial College London who is leading the LSD study. "Although at present the amounts are too small for them to get too excited."

Crowds can also back research that might not have an immediate financial return, or any likely return at all. Many scientists across Europe are lamenting the loss of funds for true 'blue skies' research. This results from pressure from politicians in the austerity era which swings funding towards shorter-term 'impact'-related studies. Here, the crowd can fill in the gaps.

Strategic funding

On the other hand, traditional funders are supreme when it comes to bigger projects with a strategic vision. Large bodies like the European Research Council (ERC) and its US counterparts, such as the National Science Foundation (NSF) or National Institute of Health (NIH), will always have a place in science for funding big projects and infrastructure. This is the case of Elixir, the pan-European research infrastructure for biological information, or the much-maligned Human Brain Project.

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In theory, crowd and conventional funders would make odd bedfellows, with potential for conflict around necessity or strategic focus as the financial klout of the crowd grows. But does it need to be that way? Kuster thinks there are various possibilities for the two to get on. And they could even complement and learn from each other. He suggests that conventional research councils could use some of the crowd's wisdom to approve studies already marked up as containing scientific merit by their panels. Thus reducing the burden of peer review on scientists they must recruit to panels.

But crowdfunded projects do not necessarily have to miss out on more long-term strategic aims. "Crowdfunding can provide important seed money for pilot studies, which can be continued by conventional funders," says Ede Frecska, professor of psychiatry at the University of Debrecen, Hungary.

He has appealed to the crowd to support in vitro research on DMT, a hallucinogen used in South American shamanic plant brew ayahuasca; the only known psychedelic found naturally in the human body. Crowdfunding could work well too, he believes, in cases where the project passes the review and the budget is deflated by the crowdfunding cash.

Partnered funding

In turn, crowdfunders could utilise a more strategic approach, by suggesting a series of studies rather than single projects to the crowd; and ones that fitted the long term objectives of research councils. That could work if funders were willing to offer matching funding to projects that suited their remits, €100,000 from the crowd and the same from the European Research Council, for example. Studies could then be launched with long-term objectives, adequate funding, and the blessing of the masses. Working with research councils in this way appeals to Walacea founder Natalie Jonk. "I would like to work with the UK Research Councils," she says, adding that she feels she needs a few more successes before approaching them.

Ideal partners, Jonk points out, are universities, which are excellent places for crowd projects. This is because infrastructure already exists in terms of everything from equipment and expertise to communications and public engagement. "I want universities to have processes for scientists who want to crowdfund. It just needs to be coordinated," says Jonk.

Charities could also benefit from such approach. Jonk has already aligned some of Walacea's projects with smaller funding charities, which could scale up into larger collaborations. They have pending projects with Automimmune Alopecia Research UK. Another charitable sector player, the Beckley Foundation, which supports and develops both research and policy work related to prohibited drugs, co-funded the Imperial LSD study. "Since we had a great response to our LSD campaign, which shows the widespread interest of the public in the topic, I am already exploring other projects, such as researching the potential therapeutic benefits of cannabis on brain and breast cancer," says Beckley Foundation founder Amanda Feilding, based in Oxfordshire, UK.

Crowd monies on the rise

Most conventional funders contacted by *EuroScientist*, including the ERC, do not yet have plans or policies for working with crowdfunders. But Germany's Science Starter is making moves. Launched in late 2012, it is a platform run by non-profit science public engagement organisation Wissenschaft im Dialog (WiD; science in dialogue). It is backed by all major scientific organisations in Germany and has partnerships with a number of philanthropic foundations, according to Markus Weißkopf, WiD managing director. He says that the grants are usually €500 to €38,000 and target young scientists who want to realise smaller, unconventional projects.

Although there have been no concrete actions at this point, Weißkopf points out that it is already common practice for crowdfunded cultural and artistic projects to be backed by conventional funders via like-for-like funding. "At Science Starter we are now aiming to open up for this kind of funding after this 'initial phase' since 2012," he says.

Likewise, across the pond in the US, Luan says they are about to announce a partnership with a large and significant body in the country, but that they are not partnering with big funders yet. "We're still growing our community, improving the product and platform for scientists," he says. "We are tackling the long-tail of science, the interesting

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and worthwhile questions that get overlooked because they are interdisciplinary, or led by young investigators, or simply unfunded because of budget constraints."

To be continued

It is difficult not to admire the pioneering spirit that crowdfunding enthusiasts bring to the table. And they are right that their funding mechanisms can support projects that the big funders miss. Crowdfunding can also increase interest and engagement between scientists and the public. And unlike taxpayer-supported science, no-one has to pay for something they do not believe in; a feature that would make crowdfunding shy away from more controversial areas of research such as GM crops or shale gas extraction.

Both sides have things to learn from the other. In the not too distant future, some crowdfunders will want to upscale and show that they can add strategic focus to their missions to get best value and maximum impact from the crowd's cash. Conventional funders should offer matching funds that suit their priorities, and at the least should streamline their peer review systems and open up their decision making by adopting elements of crowd-centric dynamics. The future could, and should, be a symbiotic world of collaboration between the two funding mechanisms. Together, they will take us to wonderful new worlds.

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