

What is STEM Engagement?

An Interview with Karen Purcell

On August 21, 2018, [Kelly Riedinger](#), Senior Researcher at Oregon State University's Center for Research on Lifelong STEM Learning, interviewed [Karen Purcell](#), to understand her thinking on the topic of engagement. Karen Purcell directs the Celebrate Urban Birds project at the Cornell Lab of Ornithology. She has 18 years of experience in community-based participatory research, strategic planning, project management, fundraising, impact measurement and analysis. A video of Dr. Purcell's interview, as well as interviews of other researchers, is available at InformalScience.org/engagement.



What led you to study engagement?

I've worked at the [Cornell Lab of Ornithology](#) for the last 20 years. It's a conservation and science organization, and conservation and science can't be done without engagement. They can't be done without the public, without meaningful collaborations with the world at large and with all communities. I guess it depends on how you think of engagement, but to me engagement means meaningful collaborations and meaningful partnerships with people of all backgrounds, from all regions, and with varying strengths, needs, and desires. So my work and the research that I do just doesn't exist without engagement.

What specific projects have you done that focused on engagement?

Part of my time is focused on better understanding communities that are not represented in the sciences, in birding, or in conservation: what their interests are, what their motivations, what their desires are to be involved in birding, in

conservation work, and in citizen science or participatory science. So part of my time I work on the people side, and the other part of my time I work on the bird side, basically through the citizen science project [Celebrate Urban Birds](#). We're creating a project that is adaptable, flexible, and exciting that people who are new to birding and new to participatory science can engage in. The research that I do with people depends on trust and on working with people in a meaningful way in which we're equal partners. I think that, for me, true engagement occurs when you have equity and you're working with people in a way in which they feel equal. They need to feel that their opinions and experiences are valued and are an important part of the research. So in both the people and the bird work that I do, it's about listening and working with people in ways in which they feel valued.

So [Celebrate Urban Birds](#) is a citizen science project and it's continental; we work throughout the United States, throughout North America and Latin

America as well. That's the main citizen science project that I work on. I also work on a National Science Foundation-funded research project with a very long name. We call it [Examining Contextual Factors \(ECF\)](#) for short. That work is community-based participatory research. We work with approximately 15 communities across the United States who are leading research to better understand barriers to the sciences. In particular, we're focused on collaborations between large science-serving institutions like the Cornell Lab of Ornithology and community-based organizations. The majority of work that happens in conservation, in STEM, in citizen science, and in communities happens through large science-serving institutions like ours, so we're taking a look at what successful collaborations look like between large science-serving institutions and community-based organizations.

Is there anything else you want to add about how you define engagement?

I have mixed feelings about the word "engagement" because I feel like engagement is very top-down. It feels like the way that we usually define it means that if I'm at an informal science institution, for example, then it's my responsibility to get people to do something or to participate, and I just don't think that that's what engagement is all about. I think engagement is about people feeling that it's meaningful to them to be part of something, and that only happens when they're equal partners or they're fully involved in it. In other words, they're involved in something because it's meaningful to them, because they're going to benefit or their communities are going to benefit or they're going to be able to bring some positive action to their communities because of it.

How and why do you think engagement matters for science learning or science communication?

I guess again here I would pause and say, whose engagement? I would say that what science-serving institutions can do best is to become engaged themselves—the researchers, the outreach

specialists—in communities. If I really want to work in a particular community in a meaningful way, then I need to understand and be in that community. I need to engage myself with that community. So I really believe that it goes both ways, that it's not just engagement of how we at science-serving institutions engage the public, but it's also how we are engaged with the public. I think it's critical because I think if we don't do that, if we don't have this two-way engagement, we're going to end up in separate places, in silos. Then those of us working in science only talk to ourselves, we do research that is only heard by people who are like us, and the sciences become this elite or separate thing that happens in isolation from the rest of the world. So I think engagement has to happen in both directions, and it has to be part of the work that we do; otherwise, why are we doing science? Why are we doing what we're doing? I think every one of the researchers that I work with wants to make the world a better place. We want to conserve biodiversity. We want to preserve our planet, and we can't do that sitting in our offices talking to ourselves and publishing in places where nobody can access.

Do you measure engagement in the research that you do?

We think of engagement as successful if the participants are taking the work as their own and disseminating it themselves—in other words, if they've adapted a project to their community or to their niche. If they're working, for example, with homeless communities, or with low-income Latino communities in urban locations, and they've taken a project or research that they feel is part of them—because part of their voice is clearly heard in that project or that research—and then they adapt it to their community and begin to disseminate it and be the voices for the project or the research, then to me that's true engagement. If that doesn't happen, if there's one-time participation and then they move on to other things, or if it feels like something that they were part of but they don't fully understand what it was all about, or they feel like it's something that someone else is doing and that they were only

invited guests, then to me that's not true engagement.

The way to measure engagement depends on the size of the project. So if we're working, for example, with around 15 community organizations on community-based participatory research, that's easy. The community researchers themselves have created a survey, and they record when any one of them or people that they've invited or outside folks come and use the research. The survey asks questions like "What venue will you be presenting at?" In general, the questions cover what they're doing, why they're doing it, how many people they've reached, and what the effect was. But mostly it asks why they want to do it in this particular place. So that's the survey that they've created to measure the scope of whatever they're disseminating. On the other hand, if you've got a project like *Celebrate Urban Birds*, that's a huge project; it's continental. So we measure at a large scale by looking at the number of kits that have been distributed, the number of mini-grants that we've been given, and so on. We've also asked folks to participate in evaluation if they've been part of those projects. We send out surveys asking who participated and what they learned. But really the more meaningful part of that engagement comes when we work with individual communities. We adapt the evaluation and our understanding of engagement to the community specifically.

I'll give you a quick example. We're working in the Amazon with underserved communities there, and we've created a regional citizen science project that's part of *Celebrate Urban Birds* with their own species and with curricula that teachers can use that support the understanding and knowledge around those species and around citizen science or participatory science. We've embedded evaluation in both the citizen science project itself and in the curricula that the teachers can use with their students. We co-created these materials by talking to teachers and the folks who are on the ground there, understanding what engagement looks like and what successful engagement would look like in that community, as opposed to what it might look like

here in Ithaca, New York, or in New York City. That understanding allows us to then ask questions that are meaningful for that particular community.

What advice would you give practitioners who are trying to integrate your findings about engagement into their work?

For me, the most important thing is for practitioners to get out into the communities that they want to work with and to talk to people. Have a cup of coffee with someone who is in that community with your participants. Understand what they're trying to get out of your project, why they've come to your project, or what the benefits are for them. The biggest and most meaningful thing, in the 20 years I've been working at this, has been to listen. You don't have to stay in your office and try to work remotely to get something done and copy what has been done before in projects like yours. Understand your own project like nobody else. Talk to the people who are part of your project. Understand what their definition of engagement is, when they are engaged, when they are not engaged. And co-create as much as possible: co-create your evaluation, co-create your measures of success, co-create your project and adapt it and continue adapting it as you learn more. That's the biggest thing.

What are the big questions in informal science education, science communication, or even formal science education for the next five or 10 years regarding engagement?

I don't know if it's any different in the next five years than it has been. But to me the biggest questions are about how we get out of our own bubbles. How do we get out of this space that we've created that is separate from the rest of the world? How do we do work that's meaningful not just for a few people, but meaningful for many, and how do we become less exclusive, less separate, and more embedded in the communities that we want to work in? To me, the world right now is very divided and it's very silo-ed. And I think we all wanted to do good work and we all understand the power of science, but I think we have not

understand other perspectives or understood how science has had a history of use and abuse. We need to understand that to be able to meaningfully engage in all communities. I think we are naïve a lot of times when we think that science is good and the way in which we do science is perfect and others should learn how to do it. Or when we think that our jobs are to just open people's' heads and pour in the information that we've created. I think

that's a naïve way of thinking about it, because it's work that has a long history, that has not always been fair to communities; in fact, it's been incredibly unfair. But the way in which we think about science can be changed, and we can provide access to more people. And I think our desire to keep it safe in a bubble backfires because it's not sustainable.



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