The Role of Evaluation in Research Projects

CADRE recently discussed the role of evaluation and STEM education research with two scholars, Dr. Dan Hanley and Jessica Sickler*, who are involved in both research AND evaluation for NSF-funded projects. We thought that they could provide helpful insights into the potential role of evaluation in current STEM education research projects. Since project proposals that are submitted to NSF must include a plan for external review in addition to the research plan, we hope these insights will be useful for those designing research projects. This summary includes key ideas from the conversation and their reflections on the following questions.

What are the distinctions and similarities between research and evaluation, particularly at a conceptual level?

- Evaluation is aimed at generating useful, valid information for local clients to help them improve their project activities.
- Research is aimed at generating new knowledge about phenomena to broaden our knowledge base.

But, in the broadest sense, both research and evaluation are systematic inquiries aimed at collecting rigorous data to answer questions and they use the similar quantitative and qualitative approaches. NSF projects need to be knowledge-based and knowledge generating.

Confusion between research and evaluation may arise from the foci or types of questions that they ask because they both can examine aspects of a project's implementation, or impacts, or contextual factors that influence the implementation or impacts of a project. For example, some foci are more geared towards evaluation, and even specific to evaluation, include examining:

- the management of a project to help a project team improve its communication or shared vision,
- the quality of interventions (especially those that are administered by project leaders or researchers), or
- the management and implementation of a project's research and data collection activities.

Evaluation results, while they are about a specific program, do contain information that can inform the development of other projects or related interventions. Evaluation also can serve an important role in examining the authentic inclusion and participation of relevant stakeholders.

Are the audiences for evaluation versus research different?

Usually the audience for an evaluation, i.e., the key stakeholders for that study, is the project team (the people running the program or involved in the program themselves), or other program developers. Research really is aimed at people thinking about how to advance what we know about effective equitable STEM teaching and learning.

Have the roles of research and evaluation changed over time or across funding programs?

The roles have shifted and how we think about them as a field have shifted. In the past, some NSF programs were focused on robust evaluation, particularly having a strong summative evaluation plan

that was outcomes focused, documenting the impact of whatever you were creating. Then the emphasis shifted to research and ensuring contribution to the literature base and generalizable knowledge for the field, even though a lot of the questions and methods seemed to be staying consistent. This is where some fuzziness may have come in for some. For instance, research is now thinking about what adaptations we are making to interventions, and why and how we can use that information to improve the interventions in one context or another.

Also research itself started to evolve to acknowledge that we can't just sit outside and study communities and interventions. We need to actively involve the members of communities in the research and use of the findings. Design-based research, as this approach is called, can seem a lot like iterative formative evaluation so it pushes us to consider how we are creating generalizable knowledge. How is this moving beyond program improvement? It becomes challenging for program teams to be really articulate about what the purpose is on each side of that coin and how they're working together.

What are some of the common stumbling blocks that projects encounter when defining and differentiating research and evaluation components of their programs?

One of the biggest stumbling blocks is this lack of specificity and clarity in defining the roles for research versus evaluation. It's key to clearly negotiate and delineate the roles and responsibilities for the researchers of a project and the evaluators on that project. Their data can help inform each other's work since they can look at different aspects of the foci and questions. Together they can present a broader picture of a project, its activities, and its impacts. However, if they are asking duplicative rather than complimentary questions, we worry about overtaxing the projects' subjects, among other issues. Overburdening participants with requests for data may reduce the response rates and make your data less valid and representative. Also, the research team may be more embedded in the work that's being done, e.g., the creation of the curriculum or the professional development, so the evaluators are sometimes well positioned to come in as a more impartial data collector.

How much of a project's budget should be allocated to evaluation?

Budgeting should reflect the role, the contribution, the value that the evaluation is providing to the overall project. The budget will depend on the scope and the scale of the evaluation. So rather than starting with a figure, start with your questions – what you want to know – and figure out how this evaluation is going to contribute to your project. Then carve out the budget necessary to achieve those goals.

Years ago, 10 to 20% of your budget might be allocated to evaluation. This was when evaluation was the main knowledge building component of a project. That changed as a lot of that knowledge building work went into research. Now, people typically say 5-10% of a project's budget should be allocated to the evaluation, depending on the size of the project and contingent on the role that the evaluation is going to play. In small projects, 5% is not a lot of funds for an evaluator so projects may think about how to creatively use their advisory board, or other members within the community to give feedback.

What are ways that evaluators work with advisory boards and complement their efforts?

An evaluator may sit in on the advisory board and facilitate conversations from the position of holder of the evaluation data. That synthesizing role and helping align what advisors have said with what either research or evaluation data in the project has indicated, is a really important value that an evaluator can help with. Projects may feel like they have to adopt all of the feedback from their advisory board. After an advisory board meeting, however, an evaluator may present to the team what they heard, e.g., "Here's how it aligns well, or doesn't align well, with the evaluation data I got from this stakeholder group."

An evaluator can help you to create a theory of change or logic model that really specifies what the black boxes are in relation to the inputs, activities, and impacts. The process of working on the logic model will help you figure out what you need to know, have a more targeted research and evaluation plan, and an overall product design that will make a more compelling proposal. A logic model also helps delineate the roles for research and evaluation, e.g., projects often collect their own data on, for instance, level of participation. A logic model can also help identify the evaluation questions that are important about the quality of the project's activities, the extent to which inputs are in place, and/or the mediating variables that affect the intended outcomes. You really want to enter the process of developing a logic model not as a check box exercise, i.e., that thing you have to include in your proposal, but as a chance to get your thinking on paper, and find your black boxes, assumptions, and questions.

ADVICE

What would you say that would help a project lead do their work better?

- *Clearly define your goals.* You need to nail down what it is you're doing and your goals or where your questions are. If it really is an unknown, what can you find out that will move it forward?

- *Identify what is most important for the evaluation to focus on.* You can't collect data on everything. It's often better to collect really high-quality data on a few things, then to cast a broad net and get data that you can't use.

- *Use the evaluation data.* Consider how an evaluator can provide the data at the right time and in the right way and work with project teams to facilitate adoption. There are skills and strategies to crafting reports and presenting evaluation findings in ways that make them more useful to projects, as well as processes through which teams can go beyond the report to purposefully incorporate and use findings in order to help the project improve.

- *Watch out for mission creep.* An evaluator can help projects maintain their focus on which activities are aligned with their goals. Similarly, a project can change course and the evaluation may need to change course also.

What other advice might you give to awardees or those considering projects, in terms of accessing or leveraging evaluators for their knowledge?

- Evaluators often develop strong skills as facilitators with observational skills. Some evaluators use those skills in the role of process evaluator where they observe how the team is functioning and report back about the strengths and opportunities with the project team dynamics.

- Evaluators often juggle a lot of projects and have to manage multiple things. They can be assets in thinking through realistic processes and timelines for getting from A to Z.

- Have an explicit role for the evaluator to help think about the management of the project with respect to communication and shared language, understandings, and vision. If this is a role you want your evaluator to have, be explicit about it upfront and come to an agreement together about what that role will look like so that the evaluator can step in when needed.

Dan Hanley is director of STEM education research and evaluation at Western Washington University and has over 20 years of experience developing and conducting evaluations and research for the National Science Foundation, US Department of Education, the US Navy, Colorado's Department of Education and Washington State's Department of Education.

Jessica Sickler is principal of J. Sickler consulting and an experienced evaluator, researcher, educator and consultant with a strong emphasis on conservation focused education, and who has led numerous studies and evaluations of both formal and informal education settings, including K–16 classrooms, science centers, natural science museums, gardens, art museums, and history museums.