Community for Advancing Discovery Research in Education

Evaluation in DR K-12 Projects: Options

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Summary

The Discovery Research K-12 (DR K-12) Program of the National Science Foundation (NSF) supports research and development (R&D) on innovative resources, models, and tools for use by students, teachers, administrators, and policy makers. Each project has formative and summative evaluation, which are different from the project's own R&D activities and instead should support and measure the effectiveness of those activities.

Evaluation options for investigators and evaluators to consider could include the following, which are discussed below:

- Use evaluation skills and approaches that can add value to the project, such as logic modeling, identification and use of existing instruments and analytic techniques, and developmental evaluation
- Let the evaluator think "outside the project," gathering or interpreting some data independently, and attending to the context in which the project is operating
- Take a longer-term perspective, documenting project processes and, if feasible, conducting a retrospective analysis or looking across projects

NSF Requirements

The current solicitation, NSF 11-588, requires that each funded DR K-12 project incorporate (1) formative evaluation, providing feedback to project leaders; and (2) summative evaluation, substantiating the credibility of the project's evidence for its findings or claims, and thus evaluating the project's success in meeting its objectives. It states that evaluations should assess progress, recommend adjustments to plans, determine the effectiveness of project outputs, and attest to the integrity of reported outcomes.

Exploratory projects may be evaluated by an individual or an advisory board, and their evaluations should be primarily formative. Full R&D projects must have both formative

and summative evaluation, and those projects can use different evaluation teams for these two functions.

Challenges in DR K-12 Evaluation

While a host of practical problems arise in every evaluation, those conducted for DR K-12 projects are especially prone to the following challenges related to the program's purposes and design:

- ***Disentangling evaluation from the R&D itself*.** Project leaders may assume in some cases that gathering and weighing evidence is the evaluator's job, yet in DR K-12 the project itself is expected to include an evidence-based investigation. Research projects use evidence to draw research conclusions and to confirm or disconfirm their theories; development projects use pilot-test data from the field to inform and refine the development process. In evaluating either a research or development project to provide formative feedback and determine whether the project meets its goals, the evaluator typically brings questions and methods that closely resemble those of the project itself. Thus, the division of labor between R&D and evaluation is likely to need ongoing review and negotiation.
- ***Working on a small scale.*** Although some DR K-12 projects are quite large in scope, some are not. An evaluation that is proportionate in size to a small R&D project must be designed very strategically, limiting its scope to key activities that will add value, will not overburden participants, and can feasibly be completed with high quality.
- ***Working with adaptations.*** Because DR K-12 aims to support ground-breaking, relatively high-risk projects, few if any projects will proceed exactly as planned. The evaluation must remain true to essential project goals while recognizing that changes in project plans may reflect sensible adaptations to new circumstances and new understandings. Just as important, when a project is developing innovative resources and tools for students and educators, these products are likely to undergo extensive adaptation as they are tested and refined in the field. The evaluation framework must be sufficiently flexible to anticipate product adaptations and assess their quality and results.

Options

The options suggested here fall into three general categories: establishing the working relationship between the evaluator and the project; using the evaluator's toolkit; exploiting the evaluator's position outside the project; and taking a longer-term perspective. Some (such as logic modeling and independent data collection) are already common in DR K-12 evaluations, while others (such as follow-up data collection and analysis beyond the project period) would require new arrangements.

ESTABLISHING THE WORKING RELATIONSHIP

Because a key purpose of including evaluation in a project is to inform the ongoing project work, investigators will miss this potential benefit if they assume that the main purpose is to

deliver an evaluation report to NSF. Instead, they may want to clarify from the beginning how they want the evaluator to work with them.

- ***An insider-outsider perspective.*** The investigator and evaluator can plan together to ensure that the evaluator is knowledgeable about the project but not an advocate for it in the same way that project team members will be. They can make certain that the evaluator very clearly understands the project purpose, conceptual framework, and design. They can also clarify up front that the evaluator will be expected to alert the project staff to problems as they become observable.
- ***Communication about evaluation findings.*** The project design can build in dialogue with the evaluator, so that findings are understood and implications discussed. Skilled evaluators are typically very accustomed to feedback and interaction with their clients, and they find it hard to do their best work in a communication void.

USING EVALUATION TOOLS

This group of options is aimed at taking advantage of the skills and experience that an evaluator typically brings.

- ***Logic modeling.*** The evaluator can play a major role in developing a sound logic model that displays the intended path from specific project activities to immediate outcomes and in turn to longer-term desired outcomes. For development projects, a logic model can also identify the path by which the resource, model, or tool under development is intended to contribute to outcomes for students or educators. In this way, the evaluator plays a role in shaping the project design. Later, as early results are observed, the evaluator can help update the logic model to incorporate the new insights and adjustments suggested by experience in the project. Moreover, using the logic model, the evaluator can identify key strategic junctures for the project or its products, where the achievement of expected outcomes is important to later success. This not only can help focus evaluation resources at these junctures (which is important in a small-scale evaluation of a small-scale project), but also can draw project leaders' attention to them.
- ***Data collection instruments and techniques.*** Although a DR K-12 research project will ordinarily develop its own instruments, a knowledgeable evaluator may help find existing instruments that can be adapted for inclusion, thus helping the project connect its findings to those of other related work. Similarly, a development project may benefit from adapting existing surveys, interview guides, or observation protocols for use in field testing. Evaluators may also bring valuable experience in accessing and using administrative data from schools and districts for projects that are seeking effects on attendance, course taking, achievement, or other student outcomes.
- ***Analysis planning.*** Evaluators' standard tools include statistical power analysis (i.e., designing studies with samples large enough to detect effects of the expected size) and ways of anticipating and testing rival hypotheses that might account for observed outcomes. These and similar tools can help an R&D project in the early design stages and in making design adjustments when circumstances change.

- ***Developmental evaluation.*** R&D on highly innovative educational approaches brings many uncertainties. Because the projects themselves often cannot be tightly scripted in advance, the evaluation cannot presume that fidelity to an original design is entirely desirable. Developmental evaluation (Patton, 2011) offers a philosophy and techniques geared to assessing innovative projects that adapt to changing, dynamic conditions. Since Patton contends that developmental evaluation is an alternative to both formative and summative evaluation (which are required in DR K-12), its use might push the boundaries of permissible evaluation activities for the program, but it offers a different model worth considering.

THINKING OUTSIDE THE PROJECT

While investigators are committed to helping their project succeed and are understandably tempted to view its progress positively, evaluators are committed to a more skeptical stance that can help them see what the project team might miss.

- ***Gathering or interpreting data independently.*** Evaluators of DR K-12 projects very often review the data collection and analysis carried out by the project team, assessing the timeliness, thoroughness, and quality of the work. They can also take their participation in data collection a step farther. To varying degrees, depending in part on the size and stage of the project, evaluators can make their own forays into the field and take a different slant on data analysis. Teachers and other participants may offer more candid comments to evaluators than to members of the project team with whom they have been working. In data analysis, evaluators may be more alert to problems and unintended consequences than members of the project team. Still, investigators must be careful to use the evaluator's time strategically, so that it adds value to the project and does not supplant or duplicate the R&D work of the project team.
- ***Attention to context.*** In a field site, researchers rightly focus on their research questions, developers on the intervention they are testing. The evaluator can bring a more detached perspective and systematic observation protocols, and may more readily see distinctive features of the site context. In other words, while the project team looks at the "figure," the evaluator may be better able to notice the "ground," that is, the features of the educational setting that may have a powerful effect on the project's implementation or outcomes.
- ***Expert review of content and pedagogy.*** NSF expects the evaluator to produce an expert review of the project's activities and deliverables. Evaluators who are not themselves expert in all aspects of the project's content can work with other outside experts, ensuring that this review is reported fully and fairly.
- ***Identifying the potential strengths of adaptations.*** In development projects, evaluators may be more willing than the investigators to see the adaptations at field-test sites as potential improvements on the investigators' original design. Rather than rejecting these adaptations, evaluators can look at the results achieved and, if they are good results, help the investigators rethink their design on the basis of field experience.

TAKING A LONGER-TERM PERSPECTIVE

- ***Documenting project processes.*** Beyond the basic purpose of checking on the implementation of intended project activities, an evaluator can contribute to knowledge of R&D processes by documenting the work. The field can benefit from systematic study of such processes as cross-disciplinary collaboration on project teams, decision making in innovative inquiries, approaches to product design and adaptations, and development of human capital on the project team. Evaluators who are knowledgeable about education R&D can investigate how it is carried out in the project and with what results.
- ***Retrospective analysis.*** If the evaluation can extend beyond the period of the project itself, evaluators can test for the persistence of the project's results. For example, how durable are changes in teaching behaviors or student results that were identified in a research project? What aspects of a new resource or tool, if any, does a test site continue to use beyond the test period?
- ***Looking across projects.*** Although NSF funds single projects and a single evaluation for each, some evaluators work on multiple projects, and some project teams interact around shared challenges. To the extent feasible, evaluators could pool questions, instruments, and findings across projects, building a shareable knowledge base to strengthen the quality and efficiency of evaluation work in the program. The CADRE team can facilitate such sharing for interested DR K-12 evaluators through the CADRE website or other channels.

Reference

Patton, M.Q. (2011). *Developmental evaluation: Applying complexity concepts to enhance innovation and use.* New York: The Guilford Press.

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