![Community for Advancing Discovery Research in Education]

From Dissemination to Knowledge Use: Options for DR K-12

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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. Although the program embraces the aim of supporting use of the knowledge it produces, project teams may lack the know-how, incentives, or time to engage in the concerted efforts that are likely to lead to knowledge use, especially use outside the research community.

To foster knowledge use among policy makers or practitioners requires a substantial effort that invests in sustained interaction and enlists a range of supports for the prospective knowledge users. Described here are some options for more effective dissemination efforts that could lead to knowledge use. In brief, they are:

- Interact with the intended users—and many of them—early and often
- Use information channels that potential knowledge users already know and trust
- If the use of knowledge or resources from the project involves a nontrivial change in beliefs or actions, arrange supports for use
- Balance fidelity with adaptation
- Consider studying knowledge use as part of the investigation

NSF Requirements

The current solicitation, NSF 11-588, requires that DR K-12 projects include plans for "effective dissemination of project resources, models, tools, and findings to researchers, policymakers, and practitioners." It calls for "insight and creativity" in dissemination.

Challenges in DR K-12 Dissemination

Called upon to engage in dissemination, many project teams struggle. They have few examples of highly successful dissemination or scale-up to emulate. The teams rarely include communication specialists. Few R&D professionals in STEM education have had occasion to learn a great deal about knowledge use in policy or practice settings, or of effective ways to support it. University-based investigators have incentives for publishing in research journals, but not for major engagement with policy or practice communities. Practitioners on project teams, while lending useful real-world advice during the R&D process, may also have limited knowledge of effective vehicles and supports for promoting knowledge use.

Often, project teams make conference presentations and publish articles. These customary vehicles for dissemination of findings among researchers can serve their purpose effectively, especially in cases when the community of researchers to be reached already has a shared interest in the project's questions. However, they are entirely inadequate for bridging the wide gap between R&D and policy or practice. A slight adaptation of these traditional dissemination approaches—presenting at practitioner conferences, publishing in practitioner journals, or inviting policy makers to a webinar—will do little to foster knowledge use.

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Bringing about knowledge use in policy or practice requires skills and an infrastructure just as complex as those required for the R&D project that initially generated the knowledge. Smart planning, persistent engagement, and serious investments are necessary if a project is to contribute research-based knowledge to the policy discourse or support scale-up of innovative resources in teaching and learning. This paper suggests a few steps toward these goals.

Options for Supporting Knowledge Use

- *Interact with the intended users—and many of them—early and often.* Engaging a few practitioners in an R&D project can be an excellent idea, but this option involves a broader and deeper notion of engagement with potential knowledge users. It could include
  - Framing the initial research questions or development plans in sustained collaboration with policy or practice groups
  - Joining associations that represent the potential users, listening to their priorities, and aligning the project's aims with trends and felt needs in the field
  - Thinking of the release of a report as the midpoint of the dissemination effort, after a lengthy process of consultation and followed by discussions with a range of potential users of the findings
  - Working with members of the potential user groups in collaborative dissemination efforts

- Briefing policy makers or administrators repeatedly on the project's progress and how its results might address purposes that they have said are important to them
- ***Use information channels that potential knowledge users already know and trust.*** These channels include media and people.
    - A project-specific website might come to the attention of potential users by way of search engines, but using multiple, popular channels improves the chances of reaching potential users. Using Facebook and Twitter to publicize the project's purposes and results can multiply the reach of a dissemination plan. However, the internet is increasingly crowded with resources clamoring for practitioners' attention, making an electronic strategy for knowledge use at best an adjunct to more intensive efforts.
    - People and organizations that already have the trust of potential knowledge users are key allies. In policy arenas, in addition to the membership associations mentioned under the previous option, intermediaries who can help communicate the study findings can include the think tanks that routinely engage in the policy conversations on an issue. For knowledge and resources aimed at practitioners, valuable intermediaries include associations; local, regional, and state agencies whose mission includes supporting practice improvement, such as the regional service agencies in many states; and technical assistance grantees of the U.S. Department of Education such as the Comprehensive Centers.
- ***If the use of knowledge or resources from the project involves a nontrivial change in beliefs or actions, arrange supports for use.*** Several types of support contribute to knowledge use, and redundancy is helpful because all types of support are vulnerable to change.
    - For practitioners, knowledge about the technical specifics of a new practice, including its proven results, is only one kind of support for change. At least as important are the opportunity to learn more about the practice with colleagues, over time, and robust support from the organizational level.
    - It is helpful to set up many types of support for practice change, because each type can be fragile. In a school district, for example, the mathematics coaches who were ready to support use of a new practice might be laid off en masse; teacher turnover might thin the ranks of supportive colleagues, especially in low achieving schools; a new superintendent might bring new initiatives while sweeping out the previous round of reforms.
    - Developing routines and tools for organizational support for an innovation can also ease the path to use. For example, a classroom innovation may be more effective if scheduling adjustments can be made, either for instruction or for teacher collaboration. This means that specifying several possible procedures for rearranging the schedule will be more helpful than expecting each user site to invent its own.
    - Cross-site networks of users help maintain enthusiasm and thus can buffer innovative approaches from the setbacks that may occur in any one site.

- In short, the support arrangements needed for new practices, especially for innovative practices, call for substantial, long-term investment.
- *Balance fidelity with adaptation.* Project teams must expect to make decisions, initially and then in the light of longer experience, about the ways in which their findings and resources can be adapted for application in different contexts.
  - Part of the R&D process is an initial determination of the "non-negotiables": what are the core findings that must not be distorted, or the core aspects of a practice that must not be diluted. These core features can then be emphasized in project communications and supports.
  - Because contexts differ and knowledge users must integrate the project's findings into their broader repertoires of understandings and practices, some adaptation is inevitable. In working toward knowledge use, researchers and developers will want to determine when and how they can endorse adaptations. Perhaps experienced users of a resource can be allowed to make principled modifications, or the developer can team up with groups of users to investigate the effectiveness of modified practices.
- *Consider studying knowledge use as part of the investigation.* We have relatively little robust knowledge about arrangements for knowledge use, especially about ways of launching and maintaining scale-up processes. While not every R&D team will want to study these processes systematically, those who would be interested in doing so can make a needed contribution to the field.

A Note on Options for the DR K-12 Program

Clearly, a serious effort to enable, support, and perhaps study knowledge use can be expensive and time consuming—and it is not a type of work that every STEM education R&D team wants to engage in. The scale-up grants available under the DR K-12 program provide one option for supporting the work.

At the NSF program level, another option could be to lower expectations for routine dissemination by every DR K-12 project and instead to concentrate resources on projects that are prepared to undertake more intensive work. As a step toward major scaling efforts, NSF might offer add-on modifications to existing grants in which the investigators want to communicate their findings in policy communities or lay the groundwork for scale-up across practice settings. This would be a longer-term option, requiring a change in the program solicitation.