Towards an Evidence Framework for Design-based Implementation Research

Barbara Means and Christopher J. Harris

SRI International

Chapter Description:
Design-based Implementation Research is a departure from much educational research in terms of its characterization of what it means to conduct research that is useful and usable in education settings. This chapter examines the approach to evidence implicit in the defining features of Design-based Implementation Research and compares that evidence approach to the prevailing evidence standards for educational research.

Executive Summary

This chapter examines the approach to evidence implicit in the defining features of DBIR and compares it to the prevailing evidence standards for educational research. The authors provide a frame for knowledge building within DBIR that draws from the strengths of both design-based research methods and research designs that permit causal inference about program impacts. Moreover, they show how DBIR challenges current thinking about what counts as credible research.

DBIR and the Prevailing Evidence Standards

To fully appreciate the implications of design-based implementation research for the structuring of research and development, it is helpful to contrast DBIR with the prevailing evidence standards and the associated sequencing of types of education research promoted by the Institute of Education Sciences (IES) of the U.S. Department of Education. The IES evidence standards are deeply engrained in federal policy for education research funding. If we consider the logic behind the adoption of these standards, we find the basic assumption that there are clearly defined education programs or interventions that either "work" or "don't work." Given this assumption, the researcher's goal is to collect evidence to place an intervention in one or the other category. In this view, the contribution that research makes to practice is through identifying "what works" and disseminating this information to practitioners.

In contrast to the IES evidence standards, the evidence framework underlying DBIR treats educational interventions not as fixed objects but as practices that will be adapted to local circumstances and can be expected to undergo modifications and improvements throughout their lifespan. Accordingly, educational interventions are viewed as complex combinations of human

actions, organizational supports, and instructional resources that play out differently in different contexts and with different kinds of students. Thus, in the DBIR model, the implementation of an intervention in particular settings is itself an object of research and a critical part of understanding how to scale an intervention without diluting its effectiveness.

Standards of Evidence in DBIR

The four core DBIR principles point researchers and practitioners to early and continued joint engagement in defining a research agenda, designing and refining an intervention, and developing a theory of implementation and impact.

Working with practitioners to jointly select the problem to address as the starting point for DBIR. A basic principle of DBIR is that the research agenda is jointly negotiated with the practitioners who are partnering with researchers. Rather than defining a research question about a particular intervention and then recruiting education entities willing to implement that intervention as defined, the researcher forms a partnership with practitioners and then negotiates the research questions with them. Such negotiation, essential to DBIR, is difficult to reconcile with the model of research adopted by IES because applicants for funding must focus on research designed to identify causal relationships between education interventions and student outcomes. The degree of intervention standardization required by IES necessarily puts the researcher in the role of defining the intervention a priori and then recruiting schools and districts willing to implement the intervention as defined in the experimental protocol, rather than negotiating the intervention to be implemented in each site.

Iterative, collaborative design involves practitioners in making design decisions, and many of those decisions get driven by types of evidence other than randomized control trials. The collaborative nature of DBIR calls for research and practice partners to engage in

multiple cycles of design, implementation, and refinement. Those who engage in these efforts find that designing and developing an educational intervention involves a huge number of decisions, not all of which could possibly be tested through experimental design. For early-stage innovations, there is typically a tradeoff between gathering stronger causal evidence of effectiveness and gathering more data on implementation in a range of contexts. Innovation developers are inclined to emphasize the latter kind of data collection because they expect their intervention to be undergoing rapid evolution. Implementation data are considered important for getting feedback on the appeal and usability of the intervention in practice and for establishing the range of desirable and acceptable variations in how the intervention is implemented.

DBIR is designed to support the development of theory related to implementation as well as to classroom learning. Ample research demonstrates that interventions that "work" in one setting and occasion do not necessarily work elsewhere or at another time. DBIR proponents do not assume that an intervention that achieves a positive effect size in two or three experimental studies will necessarily have similar positive effects wherever it is implemented. Rather, they work with their practitioner partners to lay out a theory of the implementation process that is specific to the practitioners' context, and study both implementation processes and outcomes simultaneously.

DBIR researchers would expect that students exposed to an intervention would have better outcomes in those settings where theorized components of the implementation model are in place. Looking for the presence or absence of these correlations is key to testing the theoretical assumptions underlying the implementation model. These theoretical assumptions matter because they articulate the essential workings (i.e., the how and why) of an intervention. When the theorized components of the implementation model are in place, it makes it more

plausible that outcomes can be attributed to the intervention. DBIR partners typically look for these correlational patterns rather than for experimental evidence.

DBIR seeks to develop capacity for sustaining change in education systems. The hope is that DBIR partnerships lead to increases in both researcher and practitioner capacity. Researchers are expected to become smarter about how to target issues that matter for education systems in their work and about how to conduct solid research within the constraints of practicing education systems. Collaborating districts are expected to become more interested in and adept at collecting data about both the implementation practices and outcomes for their programs and interventions. There is not an expectation that classrooms, schools, and districts will launch a program of massive experimental research, but rather that they will carefully plan out implementation of major new initiatives and monitor both implementation processes and outcomes, seeking to gain insights from the variability of outcomes that can be used to refine the implementation plan for the next iteration.

Building a Knowledge Base by Synthesizing Findings across DBIR Projects

Part of what attracts educators to collaborating in DBIR is the very contextualized nature of the work. Local insight is combined with research techniques in the pursuit of further insight and on-the-ground improvements in processes and outcomes. Accordingly, one of the strengths of DBIR should be the careful documentation of implementation and contextual variables. Quantitative meta-analysis across DBIR studies of similar phenomena will be facilitated to the extent that various DBIR projects embrace common definitions and taxonomies of implementation variables so that these definitions and categories can be used in coding studies for research synthesis and moderator variable analyses.

In addition, there are several emerging alternative approaches to research synthesis that are compatible with DBIR. One entails comparative analysis of design-based research projects engaged in similar work. Another approach for tying different DBIR studies in different locations together is through the use of common tools. Aside from savings in time and dollars, using common tools is a way to insure common definitions and measures, thus facilitating synthesis of findings across projects. Finally, there is the strategy of tying multiple research efforts together through sharing datasets, a strategy that supports testing the generality of outcomes.

How DBIR is a Departure from Much Educational Research

There are three notable ways in which DBIR is a departure from much educational research in terms of its priorities, evidence standards, and conception of what it means to do usable education research. First, DBIR tends to place more emphasis on understanding local actions and outcomes and to make fewer claims for generality than other research approaches. This feature is related to the insight that programs that produce desired effects in one context may have very different outcomes in another. Second, DBIR attends to implementation processes, not just "implementation fidelity." It looks for unanticipated or unintended consequences of introducing a new practice or new instructional material into an educational setting, not just whether an experimental protocol is being followed as stipulated. DBIR has a somewhat more flexible stance toward testing causal hypotheses than is embodied in IES standards, but does not eschew experimental design as an important research tool. And third, DBIR follows a research trajectory that is more flexible and less linear than the prevailing education research and development cycle. Building understanding of how contextual features influence implementation practices and how those practices relate to outcomes gets as much or more attention as does

establishing the average effect under the DBIR approach. DBIR expects variation in outcomes

across different contexts and prioritizes the study of implementation in context as a strategy for

refining the intervention as well as one for understanding implementation and context.