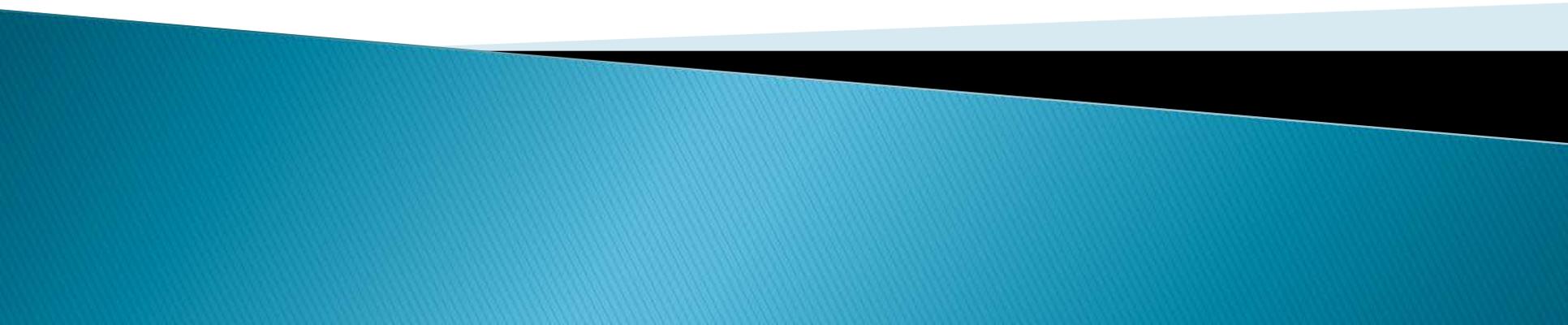
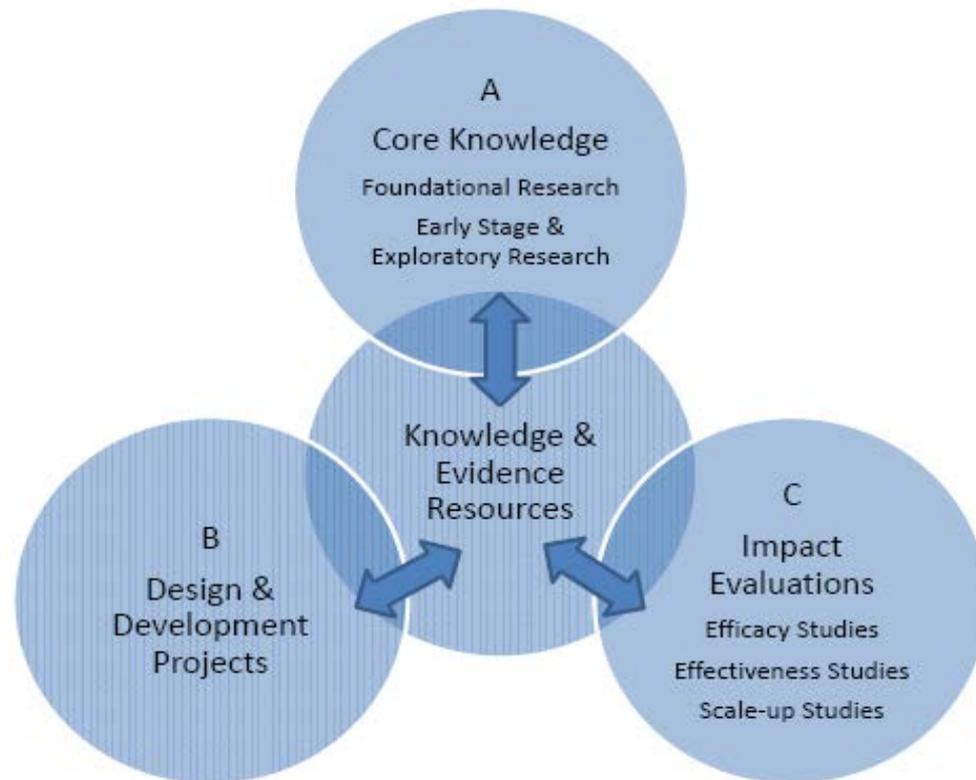


*Common Standards for  
Education Research and  
Development Proposals: NSF and  
the U.S. Department of Education*

2/28/13



# A Framework for Producing and Sharing Knowledge and Evidence Resources



# A Joint Committee of ED and NSF Membership Guided the Development of these Standards

Ex Officio: Joan Ferrini–Mundy Assistant Director, EHR and John Easton, Director, Institute of Education Sciences

Co–Chairs: Janice Earle, EHR and Rebecca Maynard, National Center for Evaluation and Regional Assistance, ED

Members:

- ▶ ED: Elizabeth Albro, IES; Karen Cator, Office of Technology; Michael Lach, Office of the Secretary; Loy Lesnick, Center for Evaluation and Regional Assistance; Ruth Curran Nield, National Center for Evaluation and Regional Assistance; Lynn Okagaki, IES; Jefferson Pestronk, Office of Innovation and Improvement; Anne Ricciuti, IES; Allen Ruby, IES; Deborah Speece, National Center for Special Education.
- ▶ NSF: Jinfa Cai, EHR–DRL; Edith Gummer, EHR–DRL; Jim Hamos, EHR–DUE; Gavin Fulmer, EHR–DRL; Janet Kolodner CISE and EHR–DRL; Susan Winter–SBE

# How did Idea for Common Standards Originate?

- ▶ Recommendations from OSTP and guidance from OMB to establish agreed-upon benchmarks across the research and development continuum that will allow “apples to apples” comparisons of research design, rationale, measurement instruments, outcomes and evaluation among other characteristics of R and D projects aimed at improving STEM education

# Goals of the *Common Standards* Project

- ▶ Improve the quality and pace of findings from education **research and development** proposals
- ▶ Develop an education infrastructure that supports more rapid and efficient knowledge development
- ▶ Aid NSF and ED in making informed choices about where to invest scarce research and development dollars
- ▶ Provide clarity for the field

# What's Included in Education Research and Development?

1. Proposals that investigate some application of practice (e.g., a new curriculum, a new technology)
2. Proposals that study the impact of an education practice or policy (e.g., what effects are the new common core state standards in mathematics having on instruction?)

## What's Included, cont.

3. Proposals that design and test new approaches to teaching and learning
4. Studies that seek to test, develop, or refine theories of education and learning that advance knowledge acquisition about the factors that facilitate or impede learning.

# What's NOT included

1. Education outreach activities (e.g., conducting sessions with schools/ classrooms on some aspect of science)
2. Scholarship programs such as Noyce or GRF
3. Projects that aim to build capacity that are based on evidence but where there is no empirical question under investigation

# Joint Committee's Assumptions

- ▶ Knowledge development is not linear, but multi-directional
- ▶ Scientific contributions by multiple researchers, research teams and practitioners are needed
- ▶ An efficient research and development program may require fewer studies as one moves from foundational to impact evaluation studies
- ▶ Implementation research is important for design and development projects and for impact evaluations
- ▶ Outcomes may be education and/or learning in multiple settings

# Types of Studies

- ▶ **Foundational research and development**
  - Fundamental knowledge that may contribute to teaching and/or learning
- ▶ **Early stage/exploratory**
  - Examines relationships among constructs to establish logical connections
- ▶ **Design and development**
  - Design and iteratively develop particular interventions (programs, policies, practices or technologies); can also pilot test fully developed intervention to see if it achieves its intended outcomes

# Types of Studies

- ▶ **Efficacy Studies**
  - Estimate the impacts of strategies under optimal conditions of implementation
- ▶ **Effectiveness Studies**
  - Examine implementation and estimate impacts similar to conditions of routine practice but still on a limited scale
- ▶ **Scale-up Studies**
  - Explores implementation and estimates impacts under conditions that prevail under wide-scale adoption

# Document Organization

- ▶ Introductory material
- ▶ NSF and ED missions– distinct but complementary
- ▶ Standards for six types of research and development proposals
  - Foundational
  - Early Stage and Exploratory
  - Design and Development
  - Impact Studies
    - Efficacy
    - Effectiveness
    - Scale-up
- ▶ Conclusions and recommendations for use

# General Structure

Section Heading	Content & Example Subheadings
Purpose	<ul style="list-style-type: none"><li>• Gives an overview of the Study Type.</li><li>• No subheadings</li></ul>
Justification Standards	<ul style="list-style-type: none"><li>• Significance for policy and/or practice</li><li>• Basis in prior theory &amp; evidence</li></ul>
Evidence Standards	<ul style="list-style-type: none"><li>• Likely project outcomes</li><li>• Plans for the research &amp; development</li><li>• Plan for external feedback</li></ul>

# Example: Design and Development–1

## Purpose

1. Design and Development Projects are intended to develop and test the promise of new or improved strategies for achieving particular educational objectives. Typically they occur in four stages: (1) development of an intervention (e.g., instructional approaches, curricula, professional development, technology, school-wide programs, or education policies) based on a well-specified theory of action appropriate to a well-defined end user, (2) creation of measures to assess the implementation of the intervention, (3) collection of data on the feasibility of implementing the intervention in typical delivery settings by intended users, and (4) conducting of a pilot study to examine the promise of the project for generating the intended beneficial outcomes.
2. In some cases funders will expect that all four stages will be completed within a given project; in other cases, design and development projects may entail sequential projects

# Example: Design and Development–2

## Justification Standards

### Theoretical & Empirical Basis

The proposal should include a strong theoretical and empirical justification for the proposed intervention (i.e., program, policy, technology or practice). If the theoretical basis rests on evidence related to individual features or components, the project should provide a compelling rationale for how combining these features or components into a new intervention is expected to achieve the intended outcomes.

# Example: Design & Development–3

## Evidence Standards

### Project Outcomes

Project outcomes should include:

1. a fully developed version of the proposed design–research (including all materials necessary for its implementation);
2. a well–specified theory of action, including evidence supporting or refuting key assumptions of the original theoretical basis for the intervention;
3. descriptions of the major design iterations and the resulting evidence to support or question key assumptions about the theory of action;
4. description of the adjustments to the theory of action and intervention design that resulted from design testing;
5. measures for assessing the feasibility of implementing the intervention in an authentic education delivery setting and data demonstrating the project’s success in such implementation; and
6. pilot data on the intervention’s promise for generating the intended beneficial student outcomes.

# Example: Design & Development– 4

## Evidence Standards

### Research Plan

The research plan should describe the method for developing the intervention to the point where it can be used by the intended end-users (iterative development process), the method for collecting evidence on the feasibility that end users can implement the intervention in an authentic education delivery setting (evidence of feasibility of implementation), and the method for obtaining pilot data on the promise of the intervention for achieving the expected outcomes (pilot study).

The discussion of the development process should include how the initial version of the intervention will be developed, and how the intervention will be improved through iterative design and testing cycles that entail refining and retesting the usability of the intervention (or components of it).

:

# Example: Impact Evaluations—Efficacy 1

## Purpose

1. Intended to generate reliable estimates of the ability of a fully-developed intervention to achieve intended outcomes. The three types of impact evaluations vary with regard to the conditions under which the intervention is implemented and the populations to which the findings generalize.
2. Efficacy studies are intended to determine if an intervention can work to improve outcomes rather than to determine what the expected impact of the intervention is if implemented under conditions of routine practice.
3. To this end, Efficacy Studies test interventions under what is sometimes called “ideal” conditions (e.g., conditions that include more implementation support or more highly trained personnel than would be expected under routine practice or implemented among a more homogeneous sample of students, teachers, schools, and/or districts than is typical).

# Example: Impact Evaluations—Efficacy 2

## Justification Standards

### Theoretical & Empirical Basis

Should demonstrate one or more of the following:

1. Empirical evidence of the promise of the intervention from a well-designed and implemented **pilot study** (e.g., a study conducted as part of a design and development project)
2. Evidence of promise based on one or more well-designed and implemented **early-stage research** demonstrating empirical support for critical links in the theory of action
3. Evidence that the intervention is **widely used**
4. Evidence of favorable impacts from a previous **efficacy study** if in a different setting or with a substantively different population group.

# Example: Impact Evaluations—Efficacy 3

## Evidence Standards

### Project Outcomes

Detailed descriptions of:

1. Study goals
2. Design and implementation
3. Data collection and quality
4. Analysis and reporting plans

Study designs should:

1. Meet WWC design standards
2. Provide for rich descriptions of the intervention and counterfactual conditions
3. Implementation analysis and descriptive relating of impacts and implementation findings

# Example: Impact Evaluations—Efficacy 4

## Evidence Standards

### Research Plan

The research plan should identify and justify the following:

1. Study design that will be used to estimate causal impact of the intervention
2. Key outcomes of interest
3. Minimum relevant effect (MRE) size that has policy or practical relevance
4. Setting(s) and target population(s) for the study
5. Sample design and power to detect impacts as small as the MRE
6. Data collection plan (procedures, measures, and strategies for ensuring reliability and validity)
7. Plans for documenting implementation, comparison group practices, and study context
8. Analysis and reporting plan

# Outreach Activities and Next Steps

## ▶ At NSF:

- Brown Bag for all NSF POs April 31, 2012
- Briefings for all EHR Divisions: November 27, 2012 (DRL); October 4 (HRD), 2012; October 10, 2012(DGE); October 11, 2012 (DUE)
- Briefing planned for SBE, January 2013
- Briefings planned for other directorates, January–February 2013
- Incorporated in the FY 12 GPRA goal on K–12
- SMaRT update, December 2012
- Internal clearance process, December – January 2013

## ▶ At ED

- Clearance through IES

## ▶ Outside NSF and ED

- Proposed sessions at professional meetings in 2013 -- American Education Research Association, National Association for Research on Science Teaching, National Council of Teachers of Mathematics, Society for Research on Educational Effectiveness

## ▶ Plans for External Review of Common Standards by outside experts, January 2013

- To be organized by IES at ED

# Other Connections

- ▶ Relates to the “design principles” for CoSTEM Strategic Plan
- ▶ Mentioned in MOU with US Department of Education
- ▶ Under discussion at OMB

# Possible uses of Common Standards

- ▶ Cited in program solicitations as applicable for research and development proposals and posted on web sites of both agencies for reference
- ▶ Some language from Common Standards included in relevant program solicitations
- ▶ Cited by other governmental organizations such as OSTP, OMB

# Suggestions?

- ▶ Develop additional documents such as FAQ sheets?
  - ▶ Identify programs in the Directorate to which these standards apply?
  - ▶ Conduct additional briefings?
  - ▶ Other??
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- ▶ NSF Contact: Janice Earle ([jearle@nsf.gov](mailto:jearle@nsf.gov))