Common Guidelines
for Education Research and Development

U.S. National Science Foundation and Institute of Education Sciences, U.S. Department of Education

Edith Gummer

[1]The following is based on material presented at the 2013 Annual Meetings of the American Educational Research Association; for additional information and to download the *Common Guidelines*, see NSF 13-126
http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf?WT.mc_id=USNSF_124

NSF-ED Joint Committee

The Joint Committee began meeting in January 2011 with representatives from both agencies.

Co-Chairs:

Janice Earle, NSF (EHR) and Rebecca Maynard, ED (Institute of Education Sciences, 2011-2012; Ruth Curran Neild, ED (Institute of Education Sciences, 2012-2013)

Ex Officio:

Joan Ferrini-Mundy Assistant Director, NSF (EHR) and John Easton, Director, Institute of Education Sciences

Members:

- **ED**: Elizabeth Albro, Joy Lesnick, Ruth Curran Neild, Lynn Okagaki, Anne Ricciuti, Tracy Rimdzius, Allen Ruby, Deborah Speece (IES); Karen Cator, Office of Education Technology; Michael Lach, Office of the Secretary; Jefferson Pestronk, Office of Innovation and Improvement
- **NSF**: Jinfa Cai, Gavin Fulmer, Edith Gummer (EHR-DRL); Jim Hamos (EHR-DUE); Janet Kolodner (CISE and EHR-DRL); Susan Winter (SBE)

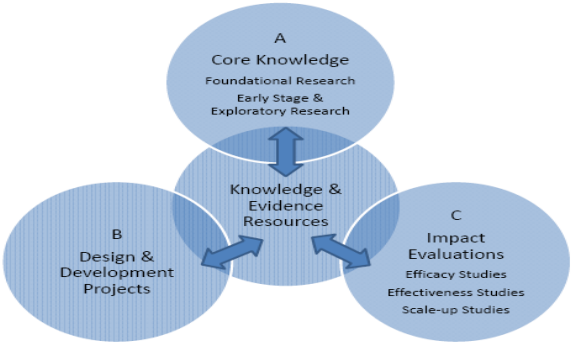
What do we mean by "Common Guidelines?"

A cross-agency framework that describes:

- Broad types of research and development
- The expected ***purposes, justifications,*** and ***contributions*** of various types of research to knowledge generation about interventions and strategies for improving learning

Knowledge Development in Education

- Is not strictly linear; three categories of educational research – core knowledge building, design & development, and studies of impact – overlap



- Requires efforts of researchers and practitioners representing a range of disciplines and methodological expertise
- May require more studies for basic exploration and design than for testing the effectiveness of a fully-developed intervention or strategy
- Requires assessment of implementation—not just estimation of impacts
- Includes attention to learning in multiple settings (formal and informal)

Who Needs Common Guidelines?

- Program Directors
- Reviewers
- Principal Investigators and perspective grantees
- Evaluators – project and program
- Congress
- General public

NSF Program Directors

- A common set of guidelines that can structure the deliberations that program directors have about the landscape of research across the different paradigms in education
  - Analyze the developmental status of awards in various portfolios
  - Identify which areas of STEM education research and development need encouragement
  - Provide technical assistance to PIs about what is needed to improve proposals
  - Encourage a focus on research in the development of new strategies and interventions

NSF Reviewers

- A common set of guidelines that can structure the deliberations that reviewers have about the quality of the research and development within individual proposals and across the proposals in a panel
  - Help provide NSF with the best information to ensure that the most robust research and development work is funded
  - Support the “critical friend” role of reviewers to provide specific and actionable feedback to PIs

NSF Principal Investigators

- A common set of guidelines that can structure the ways in which PIs conceptualize and communicate their research and development agenda
  - Beyond a single proposal – what a researcher needs to consider when planning what to do and with whom to work
  - Within a single proposal and a given type of research, what components of the work need to be included

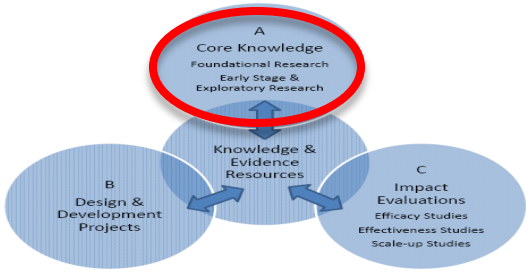
Implications for Practitioners

- Guidelines can help practitioners develop a better understanding of what different stages of education research should address and might be expected to produce
  - Helps practitioners understand what to expect from different types of research findings
  - Supports more informed decisions based on the level of evidence
  - Provides a shared sense of what is needed as practitioners engage with researchers to improve education practices

Foundational Research

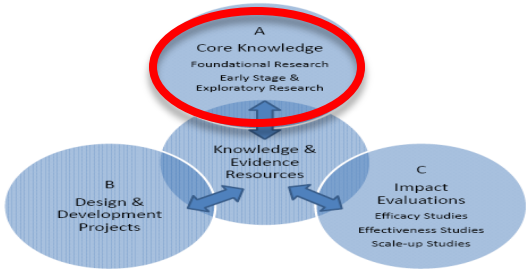
- Fundamental knowledge that may contribute to improved learning & other education outcomes

- Studies of this type:
  - Test, develop or refine theories of teaching or learning
  - May develop innovations in methodologies and/or technologies that influence & inform research & development in
  - different contexts



Early-Stage or Exploratory Research

- Examines relationships among important constructs in education and learning
- Goal is to establish logical connections that may form the basis for future interventions or strategies intended to improve education outcomes
- Connections are usually correlational rather than causal



Design and Development Research

- Draws on existing theory & evidence to design and iteratively develop interventions or strategies
  - Includes testing individual components to provide feedback in the development process
- Could lead to additional work to better understand the foundational theory behind the results
- Could indicate that the intervention or strategy is sufficiently promising to warrant more advanced

Studies of Impact

- Generate reliable estimates of the ability of a fully-developed intervention or strategy to achieve its intended outcomes

- **Efficacy Research** tests impact under "ideal" conditions
- **Effectiveness Research** tests impact under circumstances that would typically prevail in the target context
- **Scale-Up Research** examines effecti
  range of populations, contexts, and ci

Important Features of Each Type of Research

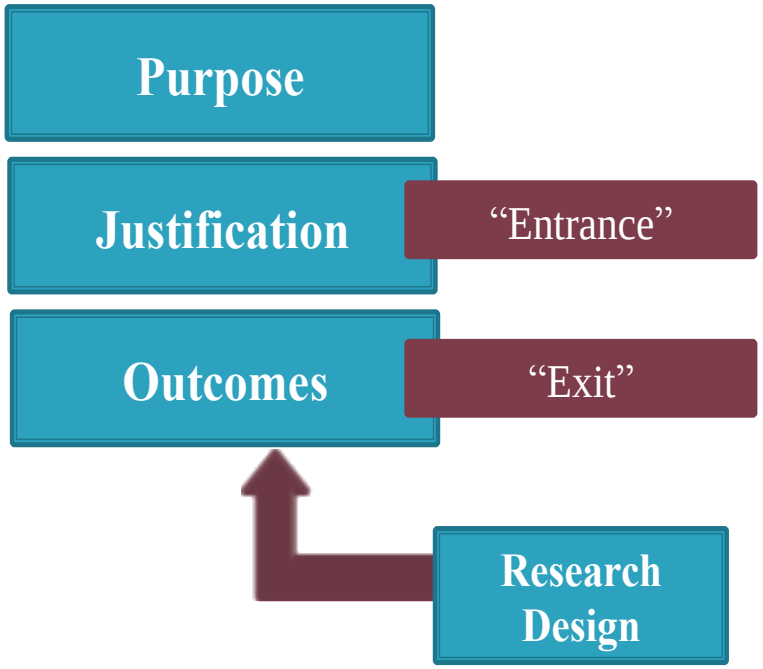
Purpose	How does this type of research contribute to the evidence base?
Justification	How should policy and practical significance be demonstrated? What types of theoretical and/or empirical arguments should be made for conducting this study?

(continued)

Important Features of Each Type of Research

Outcomes	Generally speaking, what types of outcomes (theory and empirical evidence) should the project produce?
Research Plan	What are the key features of a research design for this type of study?

Graphic representation Entrance and Exit Guidelines



Important Features… *(continued)*

External Feedback Plan	Series of external, critical reviews of project design and activities Review activities may entail peer review of proposed project, external review panels or advisory boards, a third party evaluator, or peer review of publications External review should be sufficiently independent and rigorous to influence and improve quality

Comparisons & Sticking Points - Purpose

Exploratory/ Early Stage	Design & Development	Impact	
		Efficacy	Effectiveness
Investigate approaches, develop theory of action, establish associations, identify factors, develop opportunities	Develop new or improved intervention or strategy	Impact = improvement of X under ideal conditions with potential involvement of developer	Impact = improvement of X under conditions of routine practice

Comparisons & Sticking Points - Justification

Exploratory/ Early Stage	Design & Development	Impact	
		Efficacy	Effectiveness
Practical, important problem, Different from current practice, Strong theoretical and empirical rationale, Potential to generate important knowledge	Practical, important problem Different from current practice Potential to improve X, Strong theoretical and empirical justification for development, Theory of action or logic model, Key components	Practical problem Important Different from current practice Why & how intervention or strategy improves outcomes	

Comparisons & Sticking Points – Project Outcomes

Exploratory/ Early Stage	Design & Development	Impact	
		Efficacy	Effectiveness
Empirical evidence of factors and outcomes, Strong conceptual or theoretical framework, Determination of what next steps should be.	• Fully developed version • Theory of action • Description of design iterations • Evidence from design testing • Measures with technical quality • **Pilot data on promise**	What Works Clearinghouse guidelines on evidence of • Study goals • Design and implementation • Data collection and quality • Analysis and findings Documentation of implementation of intervention and counterfactual condition Findings and adjustments of theory of action Key features of implementation	

Comparisons & Sticking Points – Research Design

Early Stage / Exploratory	Design & Development	Impact	
		Efficacy	Effectiveness
Set of hypotheses/ research questions Detailed research design Justification of context and sample **Data collection procedures – instruments with evidence of reliability & validity** Details of data analysis	Methods for • Developing intervention or strategy – including instrumentation • Collecting evidence of feasibility of implementation • Obtaining pilot data on promise	• Study design to estimate **causal** impact • Key outcomes and minimum size of impact for relevance • Study settings & target population(s) • Sample with power analysis • Data collection plan • Analysis and reporting plan	

Using Guidelines to Examine "Proposals"

- Using the descriptions of research types provided, what evidence is provided for each feature?
- What additional evidence do you think the description needed given the Comparisons and Sticking Points.
- How well do these examples exemplify the Common Guidelines?

Key Questions for NSF

- How do we help the field with the development of instrumentation to reliably and validly measure important outcomes of DRK-12 Research and Development?
- What do we mean by "Promise"? How will we know that a DRK-12 resource, model or tool has promise?
- How do we structure studies to produce promising resources, models and tools?

Final Question

- How does Design Research or Implementation Research fit into these guidelines?

- How will the use of Big Data influence educational research and development guidelines?

Questions?

Common Guidelines for Education Research and Development:
http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf?WT.mc_id=USNSF_124

FAQ's for Common guidelines

http://www.nsf.gov/pubs/2013/nsf13127/nsf13127.pdf

Contact your program officer with questions