

# Common Guidelines for Education Research and Development

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



## An Introduction



<sup>1</sup>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

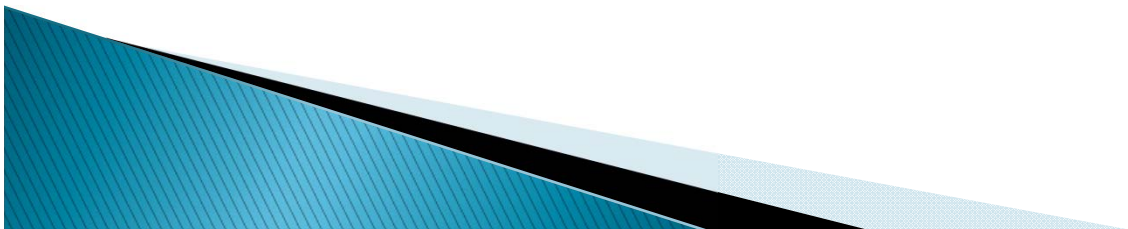
# References

- ▶ NSF 13–126 – Joint effort between NSF and the Institute for Education Sciences at the U.S. Department of Education

[http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf?WT.mc\\_id=USNSF\\_124](http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf?WT.mc_id=USNSF_124)

NSF 13–127 – Set of FAQs

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



# 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



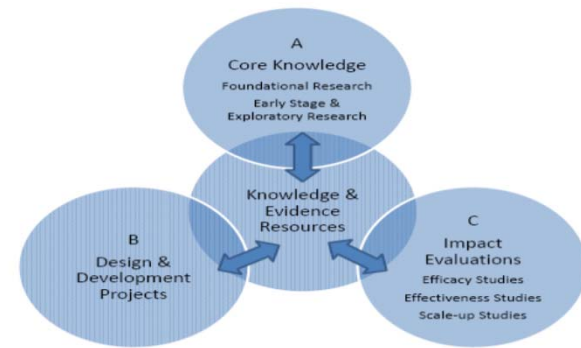
# Why do we need “Common Guidelines?”

- ▶ The American education system needs stronger evidence provided at a faster pace
- ▶ More constrained federal resources demand that NSF and ED purposefully build on each other’s research and development portfolios
- ▶ A cross-agency vocabulary and set of research expectations is critical for effective communication



# 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)



# CORE KNOWLEDGE

- Foundational Research
- Exploratory/Early Stage Research

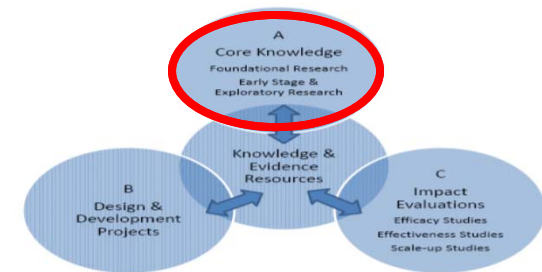


## Foundational Research

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

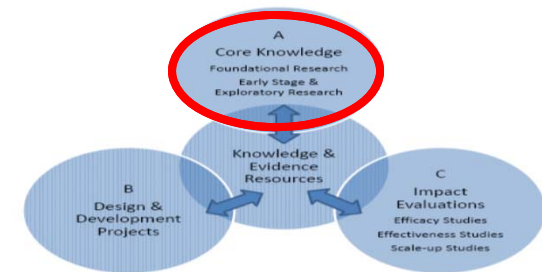
Studies of this type:

- 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



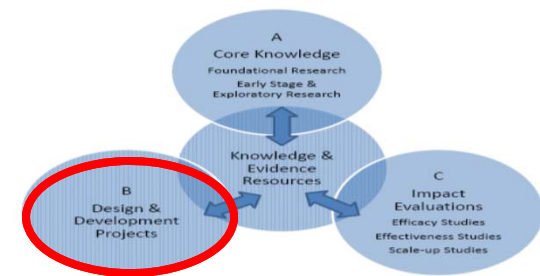
## Early-Stage or Exploratory Research

- ▶ 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



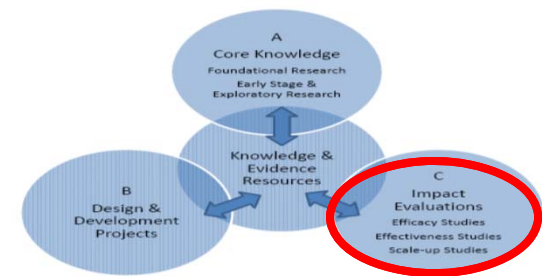
# Design and Development Research

- ▶ 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 testing



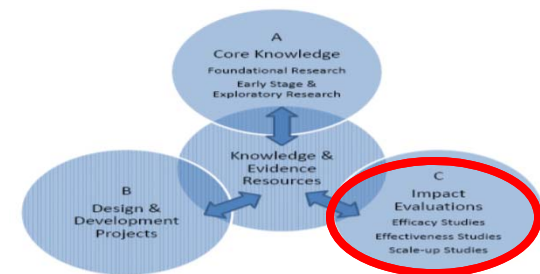
# STUDIES OF IMPACT

- Efficacy Research
- Effectiveness Research
- Scale-Up Research



**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 effectiveness in a wide range of populations, contexts, and circumstances



# 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)*

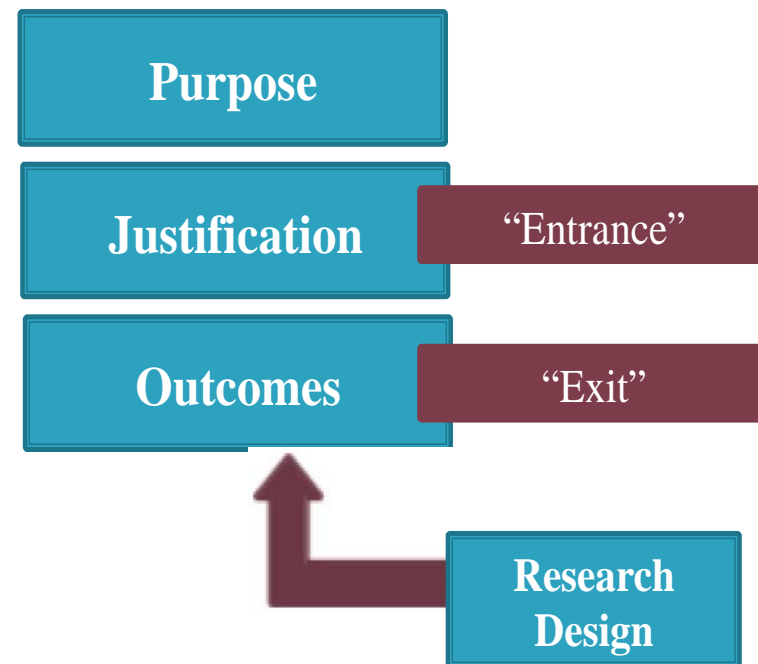
# Important Features... *(continued)*

## Outcomes

Generally speaking, what types of outcomes (theory and empirical evidence) should the project produce?

What are the key features of a research design for this type of study?

# Graphic representation Entrance and Exit Guidelines



# Comparison, in brief: JUSTIFICATION

## Exploratory/ Early Stage Research

- ▶ A clear description of the *practical education problem* and a compelling case that the proposed research will inform the development, improvement, or evaluation of education programs, policies, or practices
- ▶ A strong *theoretical and empirical rationale* for the project, ideally with citations to evidence



# Comparison, in brief: JUSTIFICATION

## Design and Development Research

- ▶ A clear description of the *practical problem* and the initial concept for the planned investigation, including a well-explicated *logic model*
- ▶ In the logic model, identification of *key components of the approach*, a description of the relationships among components, and *theoretical and/or empirical support*
- ▶ Explanation of how the approach is different from current practice and why it has the potential to improve learning

# Comparison, in brief: JUSTIFICATION

## Efficacy Research

- ▶ Clear description of the intervention/strategy and the *practical problem* it addresses; how intervention differs from others; and connection to learning
- ▶ *Empirical evidence of promise* from a Design and Development pilot study, or support for each link in the logic model from Exploratory/Early Stage research, *or evidence of wide use*
- ▶ Justification for examining impact under ideal circumstances, rather than under routine practice conditions

# Comparison, in brief: OUTCOMES

## Exploratory/ Early Stage

- ▶ *Empirical evidence* regarding associations between malleable factors and education or learning outcomes
- ▶ A *conceptual framework* supporting a theoretical explanation for the malleable factors' link with the education or learning outcomes
- ▶ A *determination*, based on the empirical evidence and conceptual framework, of whether Design and Development research or an Efficacy study is warranted, or whether further Foundational or Exploratory/Early-Stage research is needed

# Comparison, in brief: OUTCOMES

## Design and Development Research

- ▶ A *fully-developed version* of the intervention or strategy
- ▶ A well-specified *logic model*
- ▶ Descriptions of the *major design iterations*, resulting evidence, and adjustments to logic model
- ▶ Measures and data demonstrating project's *implementation success*
- ▶ *Pilot data on the intervention's promise* for generating the intended outcomes

# Comparison, in brief: **OUTCOMES**

## Efficacy Research

- ▶ *Detailed descriptions* of the study goals, design and implementation, data collection and quality, and analysis and findings
- ▶ *Implementation documented* in sufficient detail to judge applicability of the study findings; when possible, relate these factors descriptively to the impact findings
- ▶ *Discussion of the implications* of the findings for the logic model and, where warranted, make suggestions for adjusting the logic model to reflect the study findings

# Implications for Decision-Making Within Each Agency

- ▶ Guidelines will inform decision-making for agencies (individually and jointly) across different topic areas
  - Analyze the developmental status of awards and progress within various portfolios
  - Identify areas of education research and development needing additional resources/emphasis
  - Encourage more and better research on the development, implementation, and scaling of new strategies and interventions



# Implications for Peer Reviewers

- ▶ Guidelines provide guidance regarding what high-quality research design looks like
  - Gives reviewers a tool to assess the quality of the research design (for individual proposals and across a group of proposals)
  - Support reviewers in their role as “critical friends” who offer actionable feedback to PIs
  - Help ensure that agencies fund robust research and development efforts



# Implications for Peer Reviewers *(continued)*

When preparing reviewers' comments & panel summaries, we ask them to consider:

- ▶ “What is the potential for the proposed activity to advance knowledge & understanding...?”

→ *JUSTIFICATION GUIDELINES*

- ▶ “Is the plan for carrying out the proposed activities well-reasoned ... and based on a sound rationale?”

→ *GUIDELINES FOR EVIDENCE*

## Merit Review Criteria

**Notice:** Effective January 2013, the National Science Foundation implemented revised merit review criteria. While the two merit review criteria are unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria.

Please provide detailed comments on the quality of this proposal with respect to **each** of the two NSF Merit Review Criteria identified below, noting specifically the proposal's strengths and weaknesses. Both criteria are to be given full consideration during the review and decision making processes; each criterion is necessary but neither, by itself, is sufficient. Please provide comments with respect to any additional solicitation-specific review criteria, if applicable. Also, please enter a summary statement that describes your overall assessment of the proposal based on the review criteria.

When evaluating NSF proposals, reviewers should consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers are asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
  - a. advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
  - b. benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or institution to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?

Source: <https://meetings.nsf.gov/servlet/panelist.Login>



# Implications for Future Agency-Funded Principal Investigators

- ▶ Guidelines can help PIs conceptualize & communicate how the proposed research & development fits into a broader evidence-building agenda
  - Suggest components to include, within a single proposal and a given type of research
  - Identify important considerations in planning an project, including building the research team
  - Establish expectations about needed improvements in how we—as a field—develop, conduct, and apply research and scale effective practices

# 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



# 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)

# FAQs



# Do these Guidelines apply to all education projects at NSF?

- ▶ These Guidelines are most relevant for NSF programs and projects that undertake education research and development activities. Some solicitations will explicitly reference the Guidelines.
- ▶ Not intended for outreach or scholarship activities.



# How do the guidelines affect NSF's Merit Review criteria?

- ▶ The Guidelines are not intended to supplant, but are consistent with the Merit Review criteria.
  - One element of the intellectual merit criterion for proposals is whether the project can advance knowledge and understanding.
  - In addition, the intellectual merit criterion calls for a well-reasoned, well organized plan based on a sound rationale along with a mechanism to assure success.



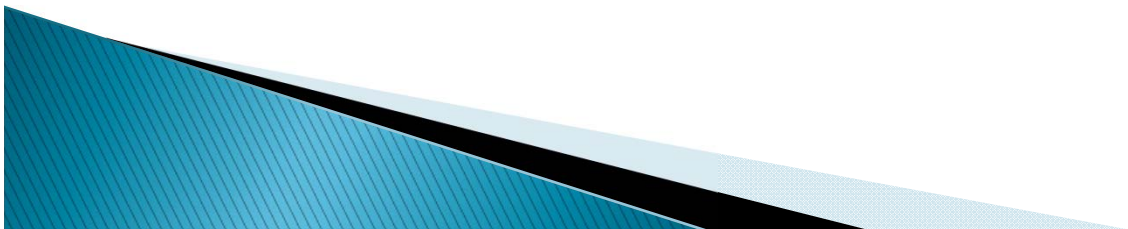
# Do the Guidelines preclude or privilege any research methodologies?

- ▶ No. The Guidelines do not preclude or favor any research methods, but they do underscore the importance of ensuring that the methods are well described, justified, and appropriate to the research questions that are posed.
- ▶ Qualitative and quantitative approaches may be used in all of the six research genres that are described in the Guidelines.



# How will reviewers be informed about the Guidelines?

- ▶ Reviewers will be informed of the Guidelines through multiple approaches. The Guidelines will be:
  - posted on the NSF website,
  - referred to in program solicitations,
  - discussed in reviewer webinars and orientations, and
  - presented at PI and other professional meetings.





# What are the implications of the Guidelines for external evaluation of projects?

- ▶ The Guidelines include recommendations for all types of studies that call for external feedback on the work being proposed.
  - External feedback can include a number of approaches including third party evaluation, program officer evaluation, and/or regular feedback from advisory groups.
  - It is up to the proposer to explain (a) why the external feedback planned is appropriate, and (b) how it is aligned with program requirements.



Will these Guidelines preclude innovative projects?

- ▶ No. The Guidelines are intended to help PIs in proposal preparation. The key point of the Guidelines is to ensure that projects are explicit about their research questions, methods and analytic approaches in their proposals. These criteria should be relevant for all types of education R&D efforts.

