Grant Writing Workshop for Development and Innovation Projects
Solution-Driven Research

Research intended to contribute to the solution of practical education problems

– Exploration
– Development and Innovation
– Efficacy and Replication
– Scale-up
– Measurement
Breaking Out of the Old Shell
Development and Innovation Projects

- Development of and innovation in education interventions
  - Curricula
  - Instructional approaches
  - Supplemental (add-on) programs
  - Professional development
  - Schoolwide interventions
  - District-level interventions
Development and Innovation Projects

- About 50 percent of NCER-funded research projects
- About 57 percent of NCSER-funded research projects
Development and Innovation Projects: Challenges

- No widely accepted, systematic process for developing interventions
- Education interventions cover a wide range in scope
- Disciplinary differences in approaches
Development Projects: Key Question

- Why is the proposed intervention likely to produce better student outcomes relative to current education practices?
Before Development Work Begins...

Ask: Do I Understand the Problem?

- Can I explain the underlying processes?
- Do I know what malleable factors might be targets for intervention?
- Do I know what distinguishes effective and less effective practices?
In a Nut Shell...

Development work depends upon prior research that explores and identifies underlying processes and potentially malleable factors. This knowledge is then used to inform the development of new interventions.
FY 2011 IES Development and Innovation Projects Include

- Well-specified theory of change for the intervention
- Fully developed intervention
- Pilot data on the feasibility of implementing the intervention
- Pilot data on the promise of the intervention for generating desired outcomes
All IES Research Applications Include Four Sections

- Significance
- Research Plan (Methodological Requirements)
- Personnel
- Resources
Specific Requirements for Development and Innovation Applications
Significance

Answers the question: “Why develop this intervention?”

1. Context for the proposed intervention
2. Intervention, theory of change, and theoretical and empirical rationale
3. Practical importance
4. Rationale justifying the importance of the proposed research
Significance

1. Context for the proposed intervention

- Describe attributes of existing practice
- Specify shortcomings of existing practice
- Clarify the problem
- Describe how much of a change the proposed intervention is intended to achieve
Significance

2a. Intervention

• What are the components or features of the proposed intervention?
• How do the features or components relate to each other?
• Who will implement or use it?
• How will it be used?
Example: Teacher PD for Pre-K ELL Vocabulary Instruction

- **Content**
  - Which words will be taught? What is the rationale for that decision?

- **Strategies for vocabulary instruction**
  - What techniques? Rationale?

- **Delivery of information to teachers**
  - What materials? What mode of instruction for teachers? Rationale?

- **Objective**
  - What should teachers be able to do?
  - What should their students be able to do?
Significance

2b. Theory of change

• What is the causal chain of events that leads from the implementation of the intervention to the desired outcome?
Simple Model of Change

Professional Development Intervention → Vocabulary Instruction → Outcomes

Feedback loop: Outcomes impact Professional Development Intervention.
Simple Model of Change: Teacher PD for Pre-K ELL Vocabulary Instruction

**Vocabulary Professional Development Intervention**
- Resources: how many sessions and when, content, mode, materials

**Vocabulary Instruction**
- Activities: continuous assessment, using data, using strategies for teaching vocabulary

**Outcomes and Measures:**
- Outcomes and Measures: attendance, use of online resources, teacher logs, interviews, surveys, knowledge acquisition

**Outcomes**
- Outcomes and Measures: mastery vocabulary measures, standardized language measures

**Outcomes and Measures:**
- Outcomes and Measures: observations, fidelity of implementation, changes in pedagogy
Significance

2c. Theoretical and empirical rationale

• What are the theoretical and empirical justifications for the design and sequencing of the intervention components?
  – Literature review
  – Describe any prior published or unpublished work completed by your team that supports your development effort
Significance

3. Practical importance

• Describe why the fully developed intervention will have the potential to improve student outcomes in educationally meaningful increments

• Describe why the proposed intervention is affordable for and easily implemented by authentic education delivery settings
Significance

4. Rationale justifying the importance of the proposed research

• Why is this project a good idea and important to fund?
Methodological Requirements (Research Plan)

• Clear description of development activities, so that reviewers will understand
  – What will be developed?
  – How it will be developed?
  – When the development will take place?
Methodological Requirements (Research Plan)

1. Sample
2. Iterative development process
3. Feasibility of implementation
4. Pilot study
5. Measures
Methodological Requirements

1. Sample

- Describe samples and settings that will be used to
  - Iteratively develop the intervention
  - Assess the feasibility of implementation
  - Assess the promise of the intervention in the pilot data
Methodological Requirements

2. Iterative development process

• How is “operating as intended” for the proposed intervention defined?
• What data will be collected to determine how the intervention (or component) is operating?
• How will the data collected be used to revise the intervention?
• What criteria will be used to determine if the intervention or component operates as intended?
What Will Be Developed?

<table>
<thead>
<tr>
<th>Content/Feature</th>
<th>Exists</th>
<th>Partially Developed</th>
<th>To Be Developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>B</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Operating as Intended

- Define "operating as intended"
- Describe data to be collected to determine how the intervention (component) is operating
- Describe criteria to determine if intervention operates as intended
  - Correspondence with theory of change
Operating as Intended

• What data will be collected to determine how the intervention is operating?
  – Often involves collection of process data (e.g., observation of teacher implementing a lesson)
  – Feedback from users
  – Specify how data will be coded (i.e., what are you looking for?)

• How will the data be used to revise the intervention, if needed?
Operating as Intended

• Note on using experiments to determine if intervention and components operate as intended
  – Often used in Cognition and Technology projects (but not required)
  – Acceptable for use in other topics for the purpose of development
Example: Teacher PD Video Clips

• Select possible examples from videotapes of master teachers implementing strategies
• Write accompanying text for clips
• Teachers (similar to target audience) review prototype clips and text
Example: Teacher PD Video Clips

• Semi-structured interview for teacher reactions in key areas (e.g., clarity of main message, length of clip or text, organization of text and its relation to clip)
• Content analysis of interview data to identify what needs refining
• Continue to refine and assess until consistent responses for identifying main message and perception of user-friendly clips or text
Example: Use of Hypermedia

- Objective: gather data on factors that facilitate teacher use of hypermedia resources in context of teacher PD coaching
Example: Teacher PD Video Clips

• Gather data on factors that facilitate teachers’ use of hypermedia resources in context of PD program
• Small field test of PD program with hypermedia
• Track teachers’ use of hypermedia with software (e.g., what do they look at, how long, how often)
• Periodic interviews to identify what facilitates or impedes clicking on a hypermedia resource recommended by coach
Example: Teacher PD Video Clips

- Observations of teachers using hypermedia (amount of time spent on each clip or text, number of related clips or texts viewed)
- Think-aloud sessions of teachers using hypermedia
- Continue to refine and assess until consistent responses for teachers viewing suggested clip or text and usability of resources (e.g., ease of navigation)
Iterations

• Number of iterations depends on the complexity of the intervention and its implementation
Methodological Requirements

3. Feasibility of intervention

• Demonstrate that the intervention can be implemented with fidelity
  – In settings that represent the type of settings for which the intervention is intended
  – By users who are like those for whom the product is intended
Methodological Requirements

4. Pilot Study: Promise of the intervention

- Does performance on outcome measures progress in the appropriate direction?
- Is implementation of intervention associated with changes in activities and behaviors that are consistent with the theory of change?
Methodological Requirements

5. Measures

• Procedures for collecting data
  – Often includes collection of process data using observational, survey, or qualitative methodologies

• Measures to be used, including reliability and validity information, where appropriate

• A useful by-product of development is a set of fidelity of implementation measures
Personnel

- Relevant content expertise
- Methodological expertise required for conducting the study
- Experience working with schools or other education agencies
Personnel

• Include in the research narrative a brief description of the qualifications, roles, responsibilities, and percentage of time to be devoted to the project for key personnel
Resources

• Support at the research institution
• Technological support
• Letters of agreement from participating schools and/or teachers
Appendix A

- Letters of agreement from schools
- Supporting tables and figures
- Responses to reviewer comments, if resubmission
Appendix B

• Examples of curriculum materials, proposed scope and sequence, fidelity, or other observational materials
Additional Considerations—If Seeking a Second Development Award

• If seeking to further develop or extend an intervention from a previous Development award, applicants should
  – Justify the need for a second Development award
  – Describe the results and outcomes from other Development efforts
  – Describe efficacy evaluations and data (if available)
Additional Considerations—If Seeking a Second Development Award

- If a previous Development grantee wants to develop a new intervention, the applicant should
  - Indicate whether the first intervention has been evaluated for efficacy and describe results (if available)
  - Show that previous intervention improves or shows promise for improving education outcomes
Notes for FY 2011

• No applications to develop reading interventions will be accepted under the Reading and Writing topic
Award Amounts

- $150,000 to $500,000 (total cost = direct + indirect costs) per year
- A maximum of 3 years of funding may be requested
- Larger awards will be considered, but note that the size of the award depends upon the scope of the project
Review of Applications

• No more than 30 percent of funds may be used to support the collection of pilot data

• Review of methodological requirements will focus on methods for developing the intervention

• Pilot data are not intended to be a test of the efficacy of the intervention
Finding Requests for Applications

FY 2011 Requests for Applications are available on

http://ies.ed.gov/funding

Sign up for the IES Newsflash

http://ies.ed.gov/newsflash/
Application Due Dates

• Education and Special Education Research
  – 4:30 p.m. Washington, DC, time
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