BUILDING A RESEARCH REPERTOIRE

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OVERVIEW

Education research in context
Introduce the phases of treatment-focused research
Describe how researchers (should) select study designs
List the steps from the beginning to the end of a study
Identify common mistakes and mousetraps
Explain IES’s goal structure and topics
Final thoughts on establishing a fundable research agenda
EDUCATION RESEARCH

How is education research the same or different from other sciences?

What is the purpose of education research?

How does education research contribute to the health and wellness of our society?

Why do you/we do research?
# Phase Models of Research

<table>
<thead>
<tr>
<th>Language Intervention</th>
<th>Special Education</th>
<th>Institute for Educational Science</th>
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<tbody>
<tr>
<td>Pre-Trial</td>
<td>Preliminary</td>
<td>Foundational</td>
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<tr>
<td>Feasibility</td>
<td>Controlled Experiments</td>
<td>Early Stage / Exploratory</td>
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<tr>
<td>Early Efficacy</td>
<td>Efficacy / Effectiveness</td>
<td>Design and Development</td>
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<tr>
<td>Later Efficacy</td>
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<td>Efficacy</td>
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<tr>
<td>Effectiveness</td>
<td>Feasibility / Implementation</td>
<td>Effectiveness</td>
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<td>Scale Up</td>
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## RESEARCH DESIGNS BY PHASE

<table>
<thead>
<tr>
<th>Phase</th>
<th>Designs</th>
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<tr>
<td>Pre-Trial</td>
<td>Qualitative, Correlational, Descriptive, Observational</td>
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<tr>
<td>Feasibility</td>
<td>Qualitative, Correlational, Descriptive, Observational, Single-Case Experimental, Quasi-Experimental</td>
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<tr>
<td>Early Efficacy</td>
<td>Single-Case Experimental, Quasi-Experimental, Regression Discontinuity, Small RCT</td>
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<tr>
<td>Later Efficacy</td>
<td>Large RCT (Quasi-Experimental, Regression Discontinuity)</td>
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<tr>
<td>Effectiveness</td>
<td>Large RCT (Quasi-Experimental, Regression Discontinuity)</td>
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SELECTING RESEARCH DESIGNS

INAPPROPRIATE
1. Preference
2. Convenience
3. Money

APPROPRIATE
1. Questions!!!
2. Phase of research
3. Money

➢ Always choose the strongest design to adequately answer the research questions, but also stay within your budget.
1. Thorough literature review
   - Discovered preliminary work has been done
   - Many correlational and descriptive studies
   - Discovered that there were a few intervention studies, but they fell into the Feasibility phase and were of poor quality

2. Study 1 (Early Efficacy and Feasibility)
   - Small Group Intervention
   - Researchers / Developers
   - Multiple Baseline Design (SCED)

3. Study 2 (Early Efficacy and Feasibility)
   - Large Group Intervention
   - Researcher / Developers
   - Quasi-Experimental Control Group Design
RESEARCH AGENDA EXAMPLE
NARRATIVE INTERVENTION

4. **Study 3 (Early Efficacy and Feasibility)**
   - Individual Intervention
   - Research Assistants
   - Multiple Baseline Design (SCED)

5. **Study 4 (Replication and Feasibility)**
   - All 3 tiers of intervention
   - Research Assistants
   - Mixed Methods: MBD and small RCT

6. **Study 5 (Replication and Effectiveness)**
   - All 3 tiers of intervention
   - 3 Head Start teachers (end users)
   - Matched Sample Quasi-Experimental Control Group Design

7. **Study 6 (Scale up)**
   - All 3 tiers of intervention
   - District teachers and SLPs
   - Randomized Control Group across 22 school districts
THE RESEARCH STUDY

1. Read the literature on a topic of interest
2. Formulate a question
3. Write a proposal (apply for funds, if appropriate)
4. Establish a team and identify participants
5. Submit an IRB application
6. Recruit participants and obtain informed consent
7. Conduct proposed study (analyze data)
8. Complete reliability and fidelity checks
9. Analyze data
10. Present results at a conference
11. Prepare a manuscript
12. Submit and revise a manuscript
13. Celebrate when the manuscript is accepted and published
MISTAKES & MOUSETRAPs

1. Do the study for the wrong reasons
2. Underestimate the duration of the process
3. Don’t know the extant literature well enough
4. Formulate a question before knowing the literature
5. Do a study before knowing your question
6. Develop a question because you are comfortable with a specific research design
7. Misunderstand what aspects of research designs establish internal validity
8. Poor measures for the question and design
9. Rely on convenience and ease rather than quality
10. Don’t describe participants carefully enough
11. Don’t build rapport with sites and participants
12. Never write the paper
13. Don’t select an appropriate journal
IES PRIORITIES

Describe the condition and progress of education in the United States

Identify education practices that improve academic achievement and access to education opportunities

Evaluate the effectiveness of Federal and other education programs
GENERAL EDUCATION RESEARCH TOPICS

Cognition and Student Learning
Early Learning Programs and Policies
Education Technology
Effective Teachers & Effective Teaching
English Learners
Improving Education Systems: Policies, Organization, Management, and Leadership
Mathematics and Science Education
Postsecondary and Adult Education
Reading and Writing
Social and Behavioral Context for Academic Learning
SPECIAL EDUCATION RESEARCH TOPICS

Autism Spectrum Disorders
Cognition and Student Learning in Special Education
Early Intervention and Early Learning in Special Education
Families of Children with Disabilities
Mathematics and Science Education
Professional Development for Teachers and Related Service Providers
Reading, Writing, and Language Development
Social and Behavioral Outcomes to Support Learning
Special Education Policy, Finance, and Systems
Technology for Special Education
Transition Outcomes for Secondary Students with Disabilities
IES GOAL STRUCTURE

GOAL 1  Exploration
GOAL 2  Development & Innovation
GOAL 3  Efficacy & Replication
GOAL 4  Effectiveness
GOAL 5  Measurement
GOAL 1: EXPLORATION

Explore associations between education outcomes and malleable factors

Identify factors and conditions that may mediate or moderate relations between malleable factors and student outcomes

Possible methodological approaches include:

- Analyze secondary data
- Collect primary data
- Complete a meta-analysis

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GOAL 2: DEVELOPMENT & INNOVATION

Develop an innovative intervention (e.g., curriculum, instructional approach, program, or policy)
OR improve existing education interventions

AND collect data on its feasibility and usability in actual education settings
AND collect pilot data on student outcomes.

Development process must be iterative!

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GOAL 3: EFFICACY & REPLICATION

Evaluate whether or not a fully developed intervention is efficacious under limited or ideal conditions

OR

Gather follow-up data examining the longer term effects of an intervention with demonstrated efficacy

OR

Replicate an efficacious intervention varying the original conditions

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GOAL 4: EFFECTIVENESS

Evaluate whether a fully developed intervention that has evidence of efficacy is effective when implemented under typical conditions through an independent evaluation.

Prior to submitting an effectiveness proposal, at least two efficacy studies of the intervention with beneficial and practical impacts on student outcomes must have been completed.

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GOAL 5: MEASUREMENT

Development of new assessments or refinement of existing assessments, and the validation of these assessments

OR

Validation of existing assessments for specific purposes, contexts and populations
NCER GRANTS BY GOAL (2004-2012)

- Goal 2: Development 45%
- Goal 3: Efficacy 26%
- Goal 5: Measurement 12%
- Goal 1: Exploration 15%
- Goal 4: Scale-Up 2%

Percentage of Funded Grants FY 2004 - 2012

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NCSER PROJECTS BY GOAL

FY 2006 – FY 2012
% of Funds Expended
R & D Centers not Included

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OTHER RESEARCH PROGRAMS

Education Research and Development Centers
  Knowledge Utilization
  Standards in Schools
  Virtual Learning

Statistical and Research Methodology in Education
  Statistical and Research Methodology
  Early Career

Partnerships and Collaborations Focused on Problems of Practice or Policy
  Researcher-Practitioner Partnerships
  Continuous Improvement
  Evaluation of State and Local Education Programs
IES VALUES...

Mentorship for new investigators
Partnerships
End Users
Methodologists
Theory of Change
FINAL THOUGHTS

Education yourself
Search for appropriate funders and their priorities
Build relationships and great research partners
Identify a socially important real world problem
Craft a solution to the problem
Task analyze the solution into steps, phases, or studies
Begin with a thorough literature search
Draft your research questions for the whole agenda
Apply for intramural funds
Complete pilot work and be productive
Establish yourself as an expert in this particular area
Stay focused!
QUESTIONS AND DISCUSSION