

# Applying Multiple Social Science Methods to Educational Problems

Why was this forum created?

- A shift in education research funding priorities has elicited a variety of responses from our members/constituents.
- The forum's convening organizations seek constructive ways to address strengths and weaknesses of individual research methodologies to meet these needs.

# What do we hope will come out of the Forum?

Since the education research community needs to promote and conduct rigorous and comprehensive research in light of *current policy directions, limited resources, and limited access to schools*:

- Ideas for training doctoral and post-doctoral students to operate optimally under these conditions
- Promotion of more collaborative projects that capitalize on expertise from various methodologists and reduce stress on schools.

# What do we hope will come out of the Forum?

Since the selection of appropriate methods and the order of their implementation can't be arbitrary and requires expert judgment:

- Develop rubrics to help researchers and consumers of research evaluate **which methods** should be used and in **what order**.

# The Format of this Session

- Introduction of panelists: Stephen Raudenbush and Susan Bodilly.
- 10 minute compressed summary of the Raudenbush paper (to refresh the memory of those who read it in full and to provide some background to those who have not read the paper).
- 5 minute response by S. Raudenbush.
- 10 minute discussion of Raudenbush paper by S. Bodilly.
- 5 minute response by S. Raudenbush.
- Audience response and Q & A.

# **Learning from Attempts to Improve Schooling: The Contribution of Methodological Diversity**

*a compressed version*

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# Two Approaches to MM Research

Goal: The resulting inquiry will be more credible, useful or comprehensive than if one methodology were employed.

- *Ex ante* – deliberately design a data collection strategy to capitalize on the strengths of each approach.

Laub and Sampson's employed statistical models and interviews to show that employment and marriage, at no matter what age, leads to reduction in crime. Changes in geography, routine, social networks were the key variables rather than maturity.

# Two Approaches to MM Research

- *Post hoc* – seeking explanations or filling gaps in already conducted research using complementary methodological approaches.

Rosenthal and Jacobsen's Pygmalion study established the existence of the causal effects of teacher expectations.

Through qualitative methods Rist showed how teacher expectations develop.

Brophy and Good conducted quantitative studies testing Rist's theories.

# Why Is This Conversation So Salient Now?

- Questions drive methodological choices, and randomized experiments provide the clearest answers to causal questions of importance.
- There are limited dollars to spend on educational research.
- Philosophical opponents of quantitative research feel isolated by the current turn of events
- MM provides a more pluralistic approach – a third way that capitalizes on importance of providing rigorous assessments of interventions.

# Issue Priorities

- Gaps in literacy
- Low performance on measures of mathematical and scientific knowledge

# Current Policy Initiatives

- Increase resources
- Demand accountability
- Provide school choice

# Intervention Strategies

- Each strategy assumes that implementation is uniform.
- Yet we have insufficient research to fill knowledge and implementation gaps.
- Each strategy assumes that practitioners/parents will know how to implement the strategy in a way that improves instruction.

Addressing these concerns should be the central task of applied research in education.

# Questions and Methods

- Systematic experimentation should be central to the research agenda.
- Experiments should be used to validate causal effects rather than to identify what is potentially effective.
- Other research approaches are needed to define aims, target populations, promising practices, and threats to effective implementation.

# The “Gold Standard”

- RCTs have been common in school based public health studies.
- While they are currently rare in education studies, they are not impossible to pull off.

# The “Gold Standard”

- Evaluators have become sophisticated in controlling for confounding variables which can explain outcomes in non-experimental designs, but the challenge is substantial.
- School leaders and teachers will participate if their needs and concerns are addressed in the design phase and they are convinced it will lead to improved learning.

# Randomized Experiments: Necessary But Not Sufficient

Before we invest in a rigorous, large-scale RCT, we need precision in defining the outcomes we want to pursue including:

- Which students to target
- Which settings to target

Why? Students with particular needs are often of greatest importance in particular instructional situations.

# Necessary But Not Sufficient

The randomized experiment becomes a powerful tool for warranting causal effects AFTER a rather protracted process has identified the most promising interventions to change *the most important outcomes for target kids in settings of interest.*

# Defining Relevant Outcomes

Before conducting an RCT apply quantitative and qualitative methods to:

- Define goals of the intervention
- Develop assessments to measure outcomes
- Validate these assessments

Otherwise, we might be measuring the wrong outcomes with high reliability, or the right outcomes with low reliability, or, worst of all, not know what we are really measuring.

# Before Testing Promising Interventions with RCTs

RCTs ARE expensive to conduct and funding is limited.

Expertise is needed to judge not only how, but **when** in the research process to conduct RCTs

Research from a variety of methods conducted at different stages ought to be a pre-requisite for the construction of a large-scale randomized field trial.

# Targeting Populations of Interest

Students who are:

- Economically disadvantaged
- Second language learners
- Children with disabilities
- Girls
- Demonstrating potential to become top mathematicians or scientists.

# Targeting Populations of Interest

- These and other groups may thrive or flounder in instructional environments that are effective or ineffective for others.
- Therefore a variety of research strategies are needed to identify the most promising interventions for these and other target groups of students.

# Putting the Pieces Together

How the research is planned, including the application of an RCT, will affect the quality of the evidence.

Concurrently, research using other methods is essential to:

- Define outcomes and validate assessments of those outcomes
- Test the feasibility of implementing the intervention in ordinary school settings
- Clarify the subsets of students with greatest need for the intervention and find out why it works or doesn't work for them or for other students.

# Implications for Support of MM Research

To maximize effectiveness, we need:

- A relatively cohesive scholarly community to provide a flow of constructive criticism and creative ideas across disciplines and specializations.
- Appropriate research training.

# Implications for Support of MM Research

To maximize effectiveness, we need:

- Adequate funding.
- Strengthening the quality of applied research on interventions that address major educational concerns of policy leaders and the public may stimulate more research funding support.