

Methods for Studying Children's Learning in Educational Interventions

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Children's thinking and learning



Central research questions

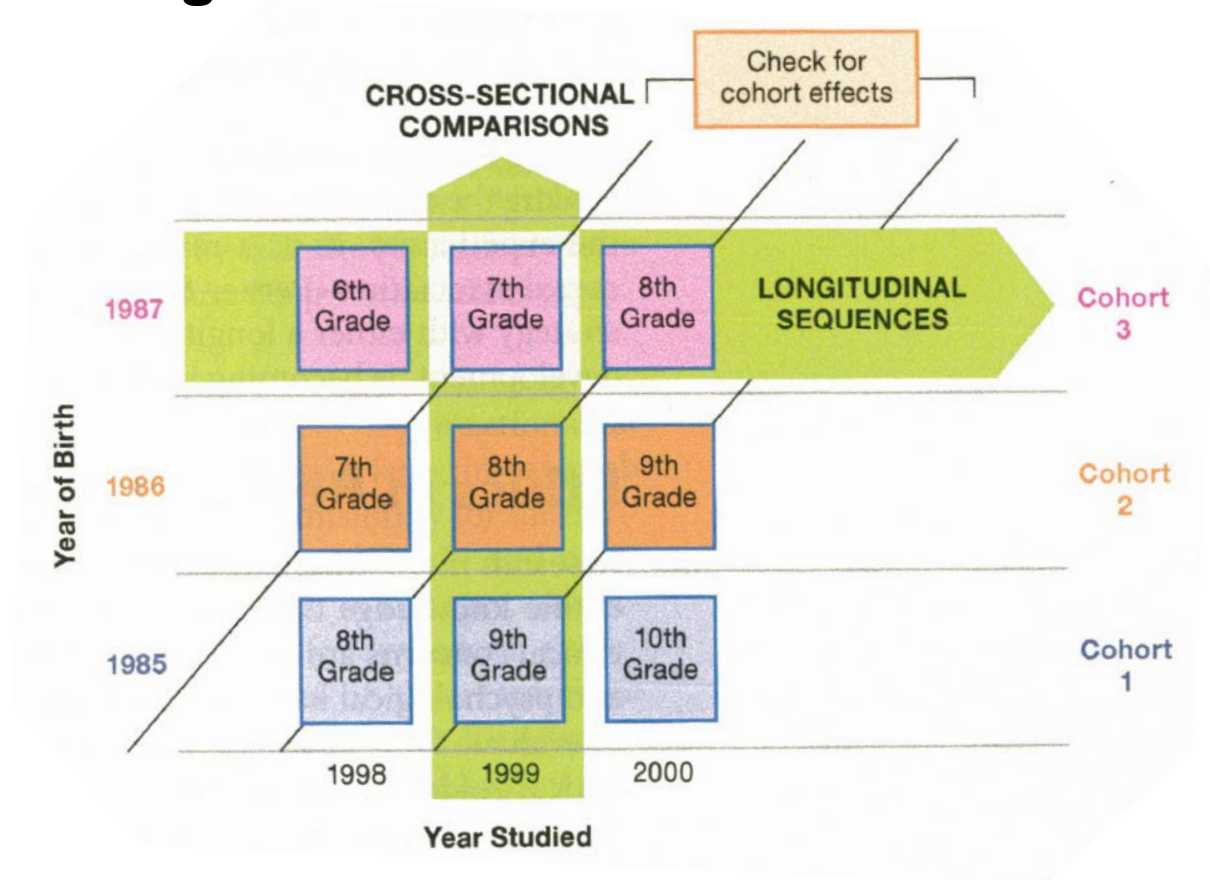
- *Theory*: What are the mechanisms underlying children's learning?
- *Development & Application*: Can we design educational interventions around these mechanisms?
- *Implementation*: How do we implement educational interventions in educational contexts?

Educational intervention design

- What are the best research methods to answer these questions?

From an undergraduate textbook...

- Optimal design for studying children's learning:
Cross-sequential design



Do people use the sequential design?

- No!
- Why?
 - Time
 - Patience
 - Participant Involvement/Attrition
 - Money
 - Questions about whether this design is optimal?
 - And more...

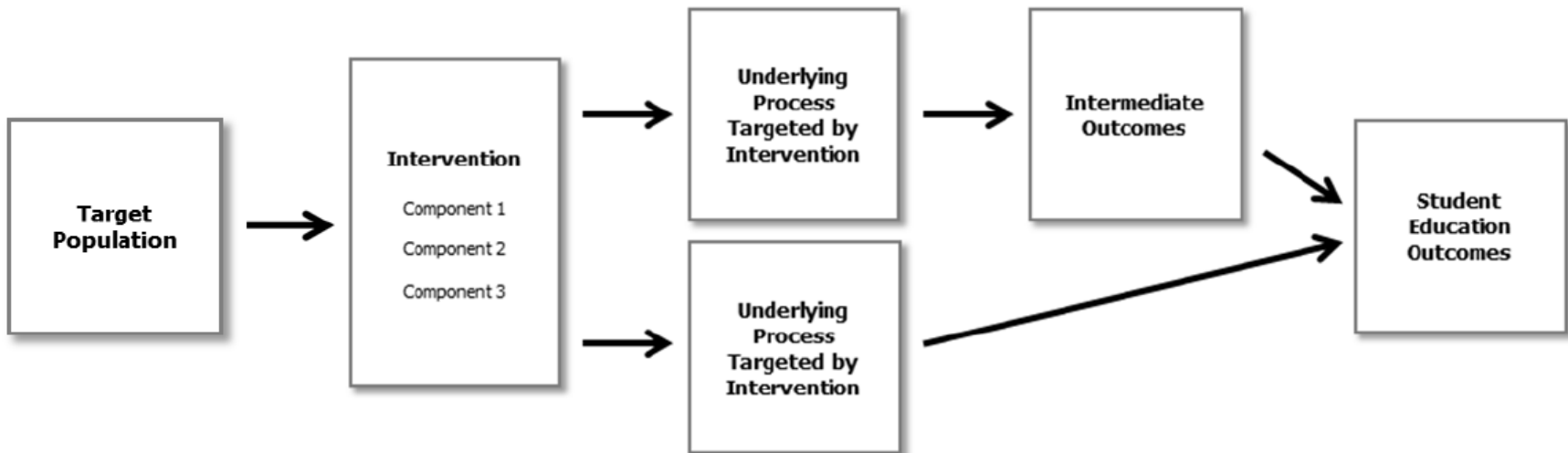
From Institute of Education Sciences (IES)...

- Goal 1: Exploration
- Goal 2: Development and Innovation
- Goal 3: Efficacy and Replication
- Goal 4: Effectiveness
- Goal 5: Measurement



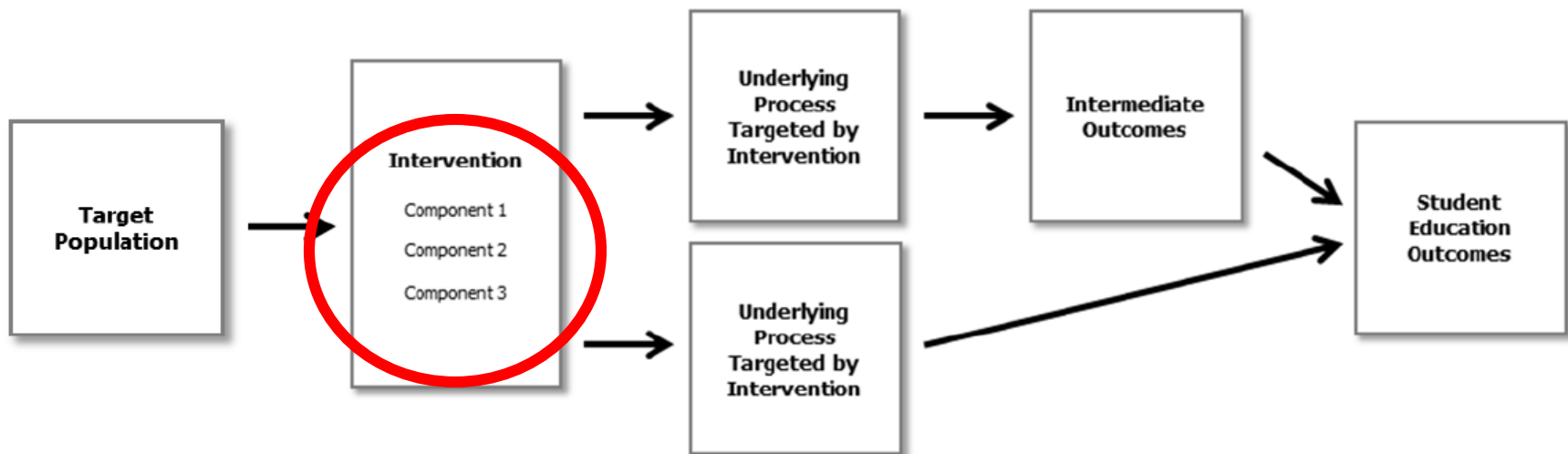
From Institute of Education Sciences (IES)...

- Goal 2: Development and Innovation



From Institute of Education Sciences (IES)...

- Goal 2: Development and Innovation



Guidance: Randomized Controlled Studies

Today

- Recent design trends in education
 - Design-based research
- Recent debates in design
 - Quasi-experimental vs. random assignment vs. matching
 - Control groups

A little history...

- Randomized controlled studies are new to education (Slavin, 2002); part of the “scientific revolution of education”
- Most researchers have not historically used these study designs when conducting research

A little more history...

- Critique: The traditional paradigm of psychology has striven for experimental control at the expense of fidelity (Lagemann, 2002)

Design-based research

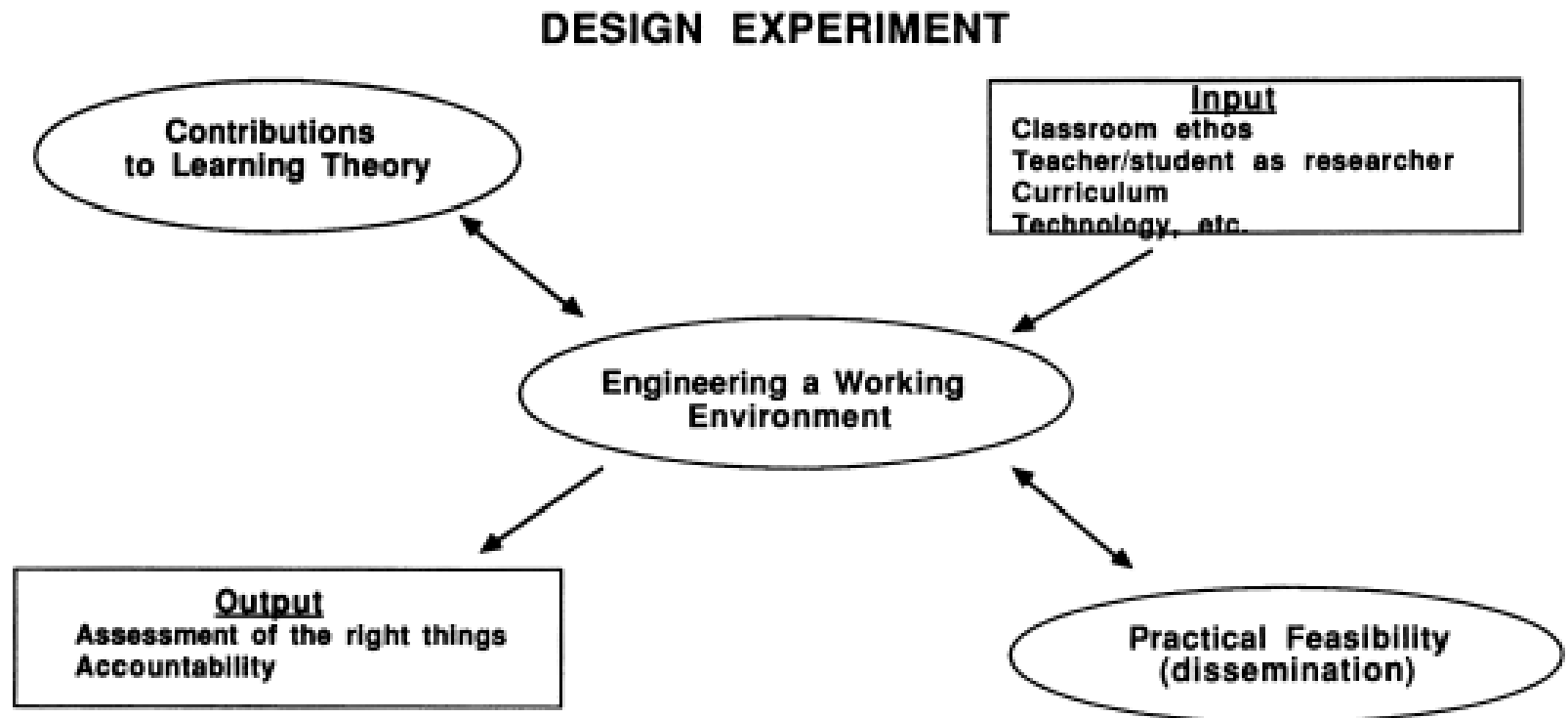
- The solution: *Designed-based research* (e.g., Brown, 1992; Sandoval & Bell, 2004)
- Answers theory, development, application, and implementation research questions that are necessary to have value for education

Design-based research

- Step 1: Answer mechanisms/theory based question
- Step 2: Iterative development and testing of educational intervention
 - Most research occurs in this step
- Step 3: Implement in organic, educational settings
- Then you can say cognitive training has occurred!

Design-based research

- Example: Ann Brown; Community of Learners (FCL) – reading interventions (Brown, 1992)



Design-based research

- *Families* of design-based research (Bell, 2004)
- Developmental psychology design-based research
- Cognitive science design-based research
- Cultural psychology design-based research
- Linguistic/cognitive anthropology design-based research
- Sociology design-based research
- Etc.

Debates

- Randomization?
- Expensive and challenging in educational contexts
- Educational contexts are not randomly assigned

Debates

- Matching?
- Less expensive and challenging
- More reflective of educational contexts

Debates

- Control group?
- Implement related, but differing curriculum

Debates

- Control group?
- “Business-as-usual” control group

Debates

- Control group?
- Now & later design; control in beginning

Moving forward?

- The “scientific revolution of education” is still in its infancy
- Educational researchers are still grappling with basic design issues that psychological scientists agree upon (e.g., random assignment)
- Cognitive training researchers are going to need to meet educators half way



Thank You!
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**LEARNING, COGNITION,
and DEVELOPMENT LAB**