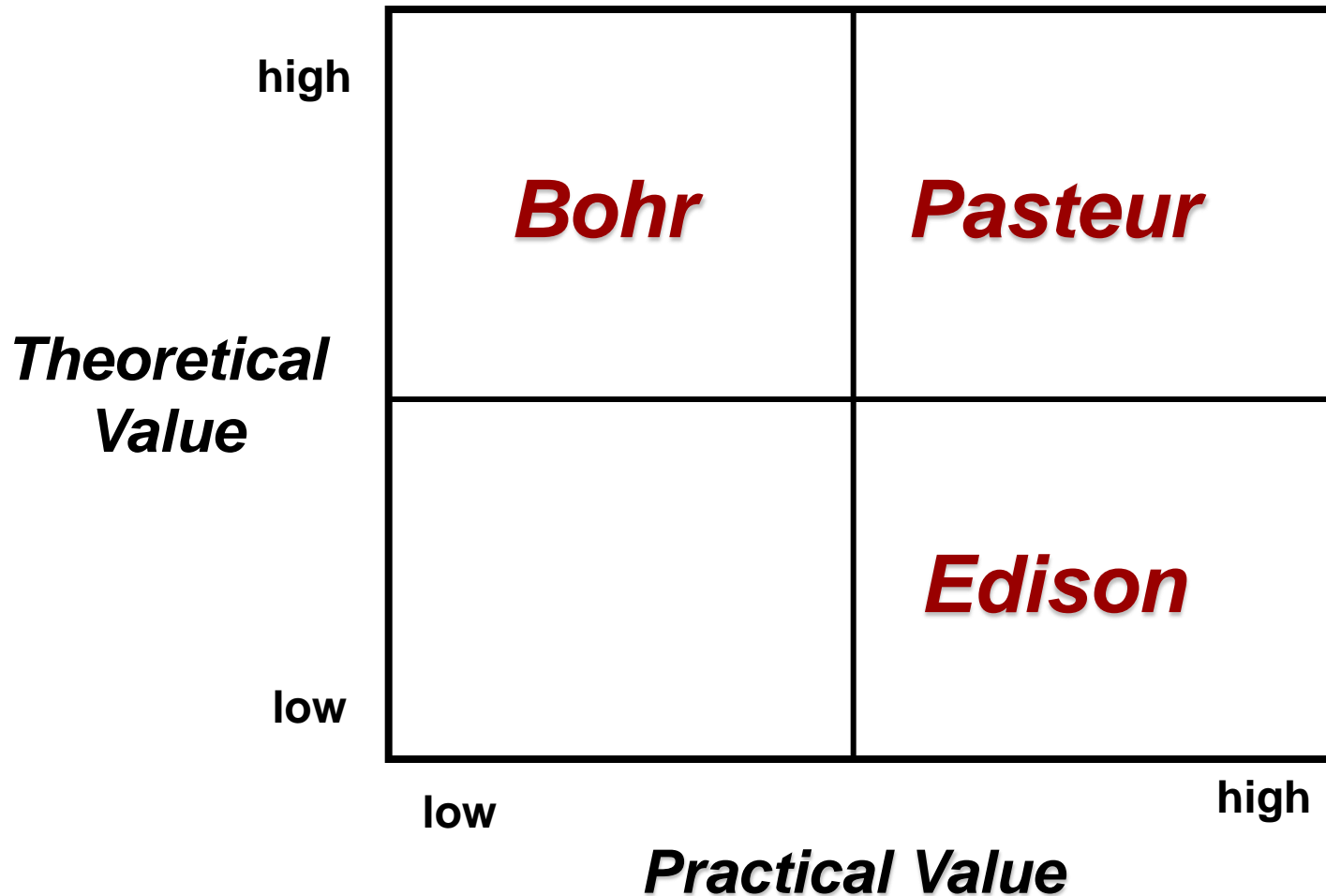


Research in Education
based on
Shavelson & Towne

Working in Pasteur's Quadrant



Limitations of Research

“Rarely does one study produce an unequivocal and durable result: multiple methods, applied over time and tied to evidentiary standards, are essential to establishing a base of scientific knowledge.”

Shavelson & Towne, 2002

Complexity of the Study Domain

“The character of education not only affects the research enterprise, but also necessitates careful consideration of how the understanding or use of results can be impeded or facilitated by conditions at different levels of the system.

Organizational, structural, and leadership qualities all influence how the complex education system works in practice.”

Shavelson & Towne, 2002

What is Scientific?

“To be scientific, the design must allow direct, empirical investigation of an important question, account for the context in which the study is carried out, align with a conceptual framework, reflect careful and thorough reasoning, and disclose results to encourage debate in the scientific community.”

Shavelson & Towne, 2002

The Six Guiding Principles of Scientific Inquiry

1. Pose significant questions that can be investigated empirically (ruling out counter interpretations and bringing evidence to bear on alternative explanations)
2. Link research to relevant theory
3. Use methods that permit direct investigation of the question
4. Provide a coherent and explicit chain of reasoning
5. Replicate and generalize across studies
6. Disclose research to encourage professional scrutiny and critique

Which is the Driving Factor - Research Questions or Methods?

- The question should drive the research methodology, not the research methodology driving the questions.
- Unfortunately, too often the reverse is true because of various belief systems about the “gold standard” and a preference for certain classes of methods - e.g., quantitative vs qualitative

The Question Should Drive Design:

Three Classes of Questions

1. What is happening?
 - Compilation of descriptive information
2. Is there a systematic effect?
 - Search for causal inferences
3. How or why does it happen?
 - Consideration of process or mechanism

Question Class 1: What is Happening?

1. Estimations of population characteristics
 - Frequency and distributional data
2. Simple relationships
 - Covariation and correlation
3. Descriptions of educational settings and contexts
 - Participants, practices, policies etc.

Question Class 2: Is There a Systematic Effect?

- *“Research designs that attempt to identify systematic effects have at their root an intent to identify a cause-and-effect relationship. Causal work is based on both theory and descriptive studies.”* (p. 108)
- Causality & Randomization
 - When feasible - true experimental design
 - When not feasible - quasi-experimental designs
 - Both have strengths and limitations

Question Class 3:

Why or How is it Happening?

1. Explorations of mechanisms when theory is well established
 - Theory guides the collection of relevant data sources related to proposed mechanisms and variation in effects or outcomes
2. Explorations of mechanisms when theory is weak
 - Theory is inadequate or underspecified to guide the search. Need for more in-depth description and/or manipulation of the situation.
 - Design experiments or design-based research