Theory and Terminology

EDP 612 Week 1

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Promises...promises

The material here is dense

There is philosophy

This is the only day that it will be like this

Nature of Educational Research

Four types of knowledge yielded by educational research

Descriptive

Predictive

Improvement

Explanative

Descriptive Studies

- Describe natural or social phenomena

  - To identify areas for further research

  - To help in planning resource allocation (aka needs assessment)

  - Provide informational information about a condition or disease

- Dependent upon instrumentation for measurement and observation

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Example

Study of 5 homosexual males who developed a rare pneumonia. This case report study led to the eventual discovery of HIV

Predictive Studies

- Predict a phenomena that will occur at a certain time from information available at an earlier time

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Example

Scholastic Aptitude Test (SAT) scores are used to predict college freshmen grade point averages

Improvement Studies

- Concern the effectiveness of practices and interventions designed to improve practice

- Not really its own type of study

Example

Secondary schools that run all year improve knowledge retention

Explanative Studies

- Explains a phenomenon

Example

Study habits change due to drinking behavior in college

Activity

Working in groups of two or three, determine each study's purpose

Theory (Formal Definition)

- Explanation of a certain set of observed phenomena in terms of a system of constructs and laws that relate these constructs to each other

  - Specifies relations between theoretical constructs

  - Describes relations between constructs and measures

- System consists of a set of constructs and their relation to each other

Theory (Informal Definition)

- General or overarching ideas that describe something

Elements of Theory

- Theoretical construct

  - *Constitutively defined construct*: having the power to establish existence.

  - *Operationally defined construct*: having the power to define process(es)

- Variable

- Law

Construct (Formal)

- Theoretical construct is a concept that is inferred from observed phenomena, defined constitutively or operationally

  - *Constitutively defined construct*: Defined by referring to another construct

  - *Operationally defined construct*: Defined by specifying the activities used to measure or manipulate it

Construct (Informal)

- A way of bringing theory down to earth, helping to explain the different components of theories, as well as measure/observe their behavior.

Examples

- Ideas defined by poverty, trust, social justice, marriage, etc.

- People defined by race, ethnicity, age, etc.

Variable (Formal)

- Quantitative or qualitative expression of a construct.

Variable (Informal)

- A characteristic that differs from others.

Examples

- *Qualitative*: Suit on a deck of cards (Spades, Hearts, Diamonds, Clubs)

- *Quantitative*People defined by race, ethnicity, age, etc.

Law

- Generalization about the causal, sequential, or other relationship between two or more constructs

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Example

- *Logic*: If this then that

Uses of Theory

- Theoretical constructs identify commonalities

- Laws of a theory enables one to predict and control phenomena

Approaches to Theory Development

- Grounded theory approach

    - Deriving constructs and laws directly from data collected

- Theory testing

    - Formulating theory and then test the theory by collecting data

Steps in Testing Theory

- Formulate a hypothesis

- Deduct observable consequences of the hypothesis

- Test the hypothesis by making observations

Application of Research to Educational Practice

- Improveing society and individual lives

- Developing tests

  - Academic achievement
  - Aptitudes
  - Interests
  - School-related personality characteristics

- No Child Left Behind Act

- Institute of Education Sciences What Works Clearinghouse

Research Knowledge vs. Research Practice

is vs. *ought*

Questions involving *is* can be answered objectively

Questions involving *is* are value laden and only can be resolved through dialogue and a decision-making process

Limitations of Research Knowledge

- Findings have limited generalizability

- Determines *is* but within a certain worldview and set of values

- Cannot be sole base for professional practice

Importance of Basic Research

Even when this is not its purpose and even when practitioners are unaware of the research, research can influence practice

Funding for Educational Research

Of Federal funding for public schools, less than 1% allocated for research annually between 1975 and 2003

Activity

Parts of a manuscript

Epistemology

- Branch of philosophy that studies the nature of knowledge and the process by which knowledge is acquired and validated

- Philosophers of science study nature of inquiry and knowledge in the natural and social sciences

- Variety of world views

Positivism

- Assumes *objective reality* where physical and social reality is independent of those who observe it

- Observations of this independent reality, if unbiased, constitute scientific knowledge

- Focus on the study of observable behavior as the basis for building scientific knowledge

Positivism

- Assumes *objective reality* that can only be known imperfectly

- Theories about objective reality cannot be validated in an absolute sense, but their validity can be strengthened through their resistance to research efforts to refute them

Postpositivism: Research Practice

- Creates concepts and procedures that are shared and publicly accessible

- Replicability of findings

- Refutability of knowledge claims

- Controls for errors and biases

- Boundedness of knowledge claims

- Moral commitment to progressive discourse

Constructivism

- Assumes *social reality* is constructed by the individuals who participate in it where ascription of meanings are reliant on the social environment

- Each person constructs a self

- *Reflexivity: researcher's self is an integral constructor of the social reality*

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Modernism

- Promotes the advancement of knowledge through scientific observation

- Believes that "…under the seeming surface chaos of the world, of society, there exists a rationality, a basic truth that can be identified and harnessed for human good"

Postmodernism

- Questions the rationality of human judgment

- Doubts that any method or theory, discourse or genre, tradition or novelty is "right" or better than another

Realism

- Believes real world consists of layers of causal structures, some of them hidden from view, that interact to produce effects that may or may not be observable

Analytic Induction vs. Deduction

Induction: Researcher analyzes the data and then infers findings

Deduction: Researcher identifies findings prior to data co[...] and then searches for instances of findings

Views of Causation

- Positivists:

  - mechanical view of causation

  - every step from cause can be traced to the effect

- Constructivists

  - interpretive view of causation

  - people develop interpretations of the social environment that affect their subsequent action

- Realists

  - structural view of causation

  - multiple layers of causal structures, which are real objects that interact with each other to cause people to take certain actions or, in some cases, to take no action.

Quantitative Research

- Assumes an objective social reality (positivist)

- Assumes that social reality is relatively constant across time and place

- Views causal relationships among social phenomena from a mechanistic perspective

- Takes a objective, detached stance toward research participants and their settings

- Studies populations or samples that represent populations

- Studies behavior and other observable phenomena

Qualitative Research

- Studies human actions in natural settings

- Makes holistic observations of the total context within which social action occurs

- Discovers concepts and theories after data have been collected

- Generates verbal and pictorial data to represent the social environment

- Uses analytic induction to analyze data

- Generalizes case findings by identifying other similar cases

- Prepares interpretive reports that reflect researchers' constructions of the data and an awareness that readers will form their own constructions from what is reported

Mixed Method Research

- Combines both quantitative and qualitative methods in a single study

- Not enough just to have both, they have to be *mixed* somehow!

Formal Research Definition

A form of inquiry in which

1. Key concepts and procedures are carefully defined in such a way that inquiry can be replicated and possibly refuted

2. Controls are in place to minimize error and bias

3. Generalizability limits of the study are made explicit

4. Results of the study are interpreted in terms of what they contribute to the cumulative body of knowledge about the object of inquiry

Scientific Research

Six guiding principles

1. Poses significant questions that can be investigated empirically

2. Links research to relevant theory and continually generates and refines theories

3. Uses methods that permit direct investigation of the questions

4. Provides a coherent and explicit chain of reasoning from an investigation's empirical results to inferences based on these results

5. Calls for replication studies to validate, generalize, and synthesize the results of individual studies

6. Discloses a study's findings to encourage professional scrutiny and critique

That's it. Questions?