Consider the Following

☐ What have you encountered in your professional or personal life that you would like to know more about?

☐ Who or what would you rely on to learn about these things?

☐ Why are some sources of information better than others?

For Today

☐ Some ways of knowing
☐ Different types of research
☐ Selecting topics for research
☐ Research hypotheses
☐ Communicating about your research using the review of literature

How can we know?

Six ways we can know something

- Tradition
- Expert opinion
- Personal experience
- Intuition
- Logic
  - Inductive
  - Deductive
- Research
Inductive Reasoning

- Generalizing individual observations to an entire population or concept
  - In other words, you start with specific observations and use them as a basis for broad conclusions.

Examples:
- Because 75% of students taking EPY 702 at 4:15 are native Las Vegans (specific observation), 75% of UNLV students are native Las Vegans (broad conclusion).
- Because John’s behavior and grades improved after taking Ritalin (specific observation), all children will benefit from Ritalin (broad conclusion).

Limitations
- One must observe all examples to be certain of conclusions & this is difficult
- "If we can’t measure it, it must not exist"

Deductive Reasoning

- Reasoning from the general to the specific
- Starts with a broad premise which is then used to draw conclusions about individual cases.
Deductive Reasoning

Example:
- Broad Premise:
  - All residents of Las Vegas moved here from somewhere else (broad premise). UNLV students are residents of Las Vegas. Therefore, All UNLV students are from somewhere else (Conclusion about individual).

- Limitations
  - Your premise must be correct in order to arrive at true conclusions.
  - Einstein’s theories were developed deductively, but he turned out to be correct.

Educational Research

Formal definition
- The application of scientific and disciplined inquiry to the study of educational problems.

Informal definition
- Systematically asking and seeking insight into cool, interesting, and important (hopefully) questions about education.

- Research is a **process**, not a product.

Scientific & Disciplined Inquiry

- A systematic approach to examining issues and questions that combines features of inductive and deductive reasoning with other characteristics to produce a reliable approach to understanding.

- Characteristics
  - Systematic in nature
  - Detailed descriptions of procedures used to collect information (allows for replication)
The Research Process

1. Identify Interesting and Important Topics
2. Read and critique what’s been written by others
   - Understand underlying theory & how well it is supported (or not supported)
3. Develop specific research questions / hypotheses
4. Design a study
5. Get necessary permissions
6. Collect and analyze data
7. Disseminate your findings

Researchable Issues

- Inclusion
- Phonics vs. Whole Language
- Career Burn-Out
- Disproportionate Representation
- NCLB
- Standardized Testing
- Evidence-Based Practices

... and many others.

Why Do Research?

- Help others understand research results
- Use results to understand an issue, problem, or question better
- Raise new topics for study
- Provide “Prozac Moments” for assistant professors
Research should be . . .

- Minimally-Biased
- Transparent
  - Allows for independent verification through replication
    - In other words, “trust but verify”
- Defensible
  - Should be able to explain the use of methods and interpretation of results

Research Limitations

- “Error” related to the complexity of human behavior
  - You can’t control everything that impacts behavior
- Researcher Bias
  - Your desire to obtain a particular outcome
  - Impact of the observer on the observed

Unfortunately, . . .

- Educational policy & recommendations for best practices may not be based on replicable research findings.
- Policy & practices based on tradition, experts, personal experience, intuition, or logic subjects them to criticism related to the limitations of each source of knowledge
The Question we will deal with in this course is:

What are you basing that on?

Types of Educational Research

- Basic
- Applied
- Evaluation (also known as program evaluation)

Basic Research

- Done for purposes of theory development
  - Tests basic assumptions of a theory
  - Examples
    - Bandura’s Social Learning Theory
    - Skinner’s Operant Learning Theory
    - Freud’s Psychoanalytic Theory
- In other words, basic research determines if a theory correctly explains a given phenomenon.
Applied Research
- Tests technologies or teaching methods developed from a theory
- **Examples**
  - Can a social skills training curriculum based on Bandura’s Social Learning Theory improve prosocial behavior in at-risk students?
  - Can Freud’s psychoanalysis improve mood in students with anxiety?
- In other words, applied research determines if a specific teaching method works?

Evaluation Research
also known as *program evaluation*
- Used to make decisions about programs or policy
- **Examples**
  - Social Skills Training Curriculum being used in Williams Elementary School has been implemented properly, is being used consistently, and student behavior is improving as a result of its use (*merit*)
  - Social Skills Training Curriculum program being used in Williams Elementary School is perceived to be an efficient and effective expenditure of district funds (*worth*)
Summary Example

Basic Research
- Does social learning theory accurately describe how children learn appropriate social behaviors?

Applied Research
- Is peer modeling an effective method for teaching appropriate social behavior to students?
  - Peer modeling is a teaching method based on social learning theory

Evaluation Research
- Should a school district continue to invest in a specific SST curriculum?

Quantitative vs. Qualitative Research

- Lack of a single, appropriate method to study education
  - Methods chosen reflect
    - Budget & staff
    - Access to subjects or data
    - Time
    - Specific objectives and research questions involved

- Two general types of research methods
  - Quantitative
  - Qualitative

Quantitative vs. Qualitative Research

- Basic Philosophy
  - Quantitative -
    - The world is stable, coherent, measurable, and understandable.
  - Qualitative -
    - The world can only be understood from the perspective of the individuals within it.

- Hypotheses
  - Quantitative -
    - Stated a-priori, then tested
  - Qualitative -
    - Not stated prior to study
Quantitative vs. Qualitative Research

- Interaction between the researcher and subjects
  - Quantitative - Low Interaction
  - Qualitative - High Interaction

- Variables
  - Quantitative - Defined in advance, confounding variables controlled, often measured numerically
  - Qualitative - Often not defined explicitly in advance, confounding variables are not controlled but are important contextual factors

Quantitative vs. Qualitative Research

- Data collection and analysis
  - Quantitative - Large number of subjects, often involves paper and pencil instruments, numerical data analyzed using statistical procedures after data is collected
  - Qualitative - Small number of subjects, data collection through in depth interviews, data analysis occurs throughout the study and is used to produce narratives which can be examined for patterns to describe the questions under examination.

Quantitative vs. Qualitative Research

- Quantitative and Qualitative approaches differ, but can be complimentary
  - Qualitative methods may be used to explore a new topic and develop a theory
  - Quantitative methods may then be used to test specific aspects of the theory
  - Some research designs employ both approaches
Quantitative Designs

Purposes
- Describe current conditions
- Investigate relationships
- Study causes and effects

Four major designs
- Descriptive/survey
- Correlational
- Causal comparative
- Experimental

Qualitative Designs

- Purpose – provide field focused, interpretative, detailed descriptions and interpretations of participants and their settings
- Four designs
  - Action research
  - Historical research
  - Ethnography
  - Grounded theory

Guidelines for Choosing a Research Design

- Problems dictate methods
- Each design has particular characteristics that coincide with different types of problems
Limitations of Scientific and Disciplined Inquiry Approaches

Four limitations
- Value-based, philosophical, or ethical issues or questions cannot be solved
- These approaches may overly simplify views of reality
- Methodological concerns
  - Access to subjects
  - Data collection strategies
  - Data analysis
  - Limitations of research designs
- Legal and ethical responsibilities of the researcher

Basic Components of Research

- Research Topic
- Hypotheses
- The Literature Review

Identifying a Topic

A research topic focuses and provides structure for research
Identifying a Topic

Topics are inspired by several sources
- Theory
- Personal experience
- Previous Research

Good topics are narrow & researchable

Topics form the basis for research questions or hypotheses

Identifying a Topic

Good Topics are Narrow

Three problems with broad topics
- Enlarges the scope of the research beyond reason
- Complicates organization of the literature review
- Creates studies that are too general, difficult to carry out, and difficult to interpret

Suggestions for Focusing a Topic

- Talk to experts in the field
- Read sources that provide overviews
  - Handbooks
    - Ex) Handbook of School Psychology
  - Literature Review Articles
    - Found in journals
Identifying a Topic

Good topics are researchable
- can be investigated through the collection and analysis of data.
- have theoretical or practical significance.
- can be studied ethically.
- can be adequately researched given the expertise, resources, and time constraints of the researcher.

Identifying a Topic

☐ Non-researchable topics...
- address philosophical or ethical issues.
- Cannot be resolved through the collection and analysis of data

Stating Your Research Topic

☐ The formal statement of a quantiative research topic...
- identifies important variables
- describes the specific relationship between variables
- identifies the nature of the participants
- is described in a written literature review
Stating Hypotheses

Quantitative hypotheses **should** . . .
- Be based on sound reasoning
- Be formulated on the basis of underlying theory or implications described in the literature review
- Provide a reasonable explanation for the predicted outcome
- Clearly and concisely state the expected relationships between variables
- Be be testable using the research design, sample, and data analyses reported in the article

Stating Hypotheses

- Types of hypotheses
  - Inductive
    - a generalization made from a number of observations
  - Deductive
    - derived from theory and aimed at providing evidence to support, expand, or contradict aspects of that theory

Stating Hypotheses

- Types of hypotheses (continued)
  - Research hypotheses state the expected relationship between two variables
    - Non-directional
      - a statement that a relationship or difference exists between the variables
    - Directional
      - a statement of the expected direction of the relationship or difference between variables
    - Null
      - a statement that no statistically significant relationship of difference exists between variables
Stating Hypotheses

Formats for experimental studies
- P who get X do better on Y than P who do not get X
  - P represents the participant
  - X represents the treatment
  - Y represents the outcome

Testing hypotheses
- Statistical analysis of data

Stating Hypotheses

Qualitative hypotheses
- Given the nature of qualitative research, formal a-priori hypotheses are not stated
  - Generating role of qualitative research
  - Focus is on generating new hypotheses as a result of the study (i.e., inductive hypotheses)

The Literature Review

- Outlines your topic
- Justifies your study’s significance
- Explains your specific hypotheses or research questions
- Facilitates interpretation of results
The Literature Review

A well written literature review will . . .
- Start with broad discussion of the research topic and end with narrow research questions or hypotheses.
- Be a critical analysis of existing research
  - Involves review of primary rather than secondary sources
- Be well organized & thorough

Literature Review

Differences between quantitative and qualitative reviews
- Quantitative reviews are typically conducted in the initial stages of the study
- Qualitative reviews are ongoing throughout the entire study reflecting the need to understand data as it is collected, interpreted, and synthesized