SELECTING AND DEFINING A RESEARCH TOPIC

TOPICS:
- Selecting a research topic
- Reviewing the literature
- Stating hypotheses

IDENTIFYING A TOPIC
Main sources of topics:
- **Theory**—a body of concepts, generalizations, and principles that can be subjected to investigation
  - Ex: Piaget’s theory of cognitive development, Patricia Cross’s adult learning theory, Bandura’s social learning theory, Gardner’s theory of multiple intelligences, etc.
  - Theories can also act as a *theoretical framework* for a study
- **Personal experience**—examine your own questions
  - Why does that happen? What causes that? What would happen if...? How would a different group respond to this?
- **Replication**—doing it again
  - Replication is not usually identical to the original study. Some feature or features of the original study often are altered to stretch the original findings or to determine if the original findings hold with the change.
- **Library Search/Electronic resources**
  - The library is sometimes more useful after the topic has been narrowed.
  - Listerves
  - Web sites (see the list on pp. 50-56 of the text)

NARROWING AND FOCUSING TOPICS
Broad topics:
- Makes the lit review huge!
- Complicates the organization of the lit review.
- Study becomes too general, hard to complete, and difficult to interpret.

How do you narrow?
- Talk with your advisor or experts in the field.
- Read sources that provide overviews
  - Handbooks
    - Handbook of Research in Educational Administration, The Handbook of Educational Psychology, Handbook of Research on Curriculum, Handbook of Research on Teacher Education, Handbook of Sport Psychology, etc.
  - Encyclopedias
    - Encyclopedia of Educational Research
  - Reviews
    - Review of Educational Research
- Browse the tables of contents in pertinent journals
- Read abstracts (ERIC)
The topic needs to be researchable. Researchable topics...

- Can be investigated through the collection and analysis of data (does not have to be numbers)
- Have theoretical or practical significance.
- Have been conducted ethically.
- Contribute to the educational process (or other processes)—They improve knowledge and practice!
- Can be adequately researched given the expertise, resources, and time constraints of the researcher.
- It interests you!

Non-researchable topics...

- Address philosophical or ethical issues.
  - Cannot be resolved through the collection and analysis of data.
- Address “should” questions
  - Ultimately these are matters of opinion.
  - Ex: Should competitive games be banned from elementary schools?

Difference in qualitative and quantitative designs

- A quantitative research approach requires that the researcher spell out the topic, hypotheses, design, data collection and analysis strategies prior to the study.
  - More is done of the “front end” of the study.
  - It is a deductive approach to planning research, that is, deducing from the literature possible explanations (hypothesis) to be tested in research
- With a qualitative research approach it is often more desirable to enter the research setting with only a general topic in mind to avoid preconceptions or coloring they way they look at a situation.
  - More is done of the “back end” of the study.
  - It is an inductive approach to planning research, that is, gather data/observe, notice patterns or themes, create a hypothesis, that leads to theory.
- BUT these methods are not set in stone and are not always followed.

In a research report, the introduction should include:

- The P-P-Q
- The significance of the problem
- A justification for the study in terms of its significance (Will it help improve knowledge and practice? How?)
- Theoretical Framework/Basis/Rationale
- Definition of terms
- Assumptions, Limitations, and Delimitations
- And quite often the literature review is included in the introduction (but not in your thesis!)
LITERATURE REVIEW...involves the systematic identification, location, and analysis of
documents containing information related to the research problem.

WHY DO WE DO A LIT REVIEW?

- To refine and focus on a problem.
- To determine what has already been done.
- To provide insight necessary to develop a logical framework into which the study fits.
- To provide the rationale for the hypotheses being investigated and the justification for the
  significance of the study.
- Identifies potentially useful methodological strategies or instruments.
- Facilitates the interpretation of the results.
- To avoid dead ends—one of your ideas for research may have already been thoroughly
  investigated and shown not to be useful.
- You can learn how to write research reports by paying careful attention to the style and
  organization used by authors of published research.
- Sampling of current opinions.

WHERE DO YOU START?

- With those items related to your topic
  - It may be broad at first, but begin to narrow down
  - If the topic has been heavily researched, focus only on major studies
  - If you find little information on your topic, search for topics that are related to your
    topic in some meaningful way.
- Remember, bigger does not mean better.
- Identify keywords
- Identify sources
  - Primary sources—The author actually observed or witnessed the research/event. To
    the extent possible, this type of source should be the focus of the proposal.
  - Secondary sources—The author was not a direct observer or participant in the research
    described in the article. Researchers are never sure what changes may have been made
    by the author.
  - Use handbooks, reviews, abstracts, etc. early in the review process
  - Use the references of good sources you have already identified to find other references
  - Use “AND” and “NOT” to narrow your searches; use “OR” or * to broaden a search
  - Journals, books, computer databases, search engines on the Web, thesis abstracts, ERIC,
    educational sites, etc. Many of these are online.
  - Exercise caution when using Web sites— anyone can post information on the Web!
    Internet sources must be closely examined for bias, subjectivity, intent, and accuracy.
  - Start with the most recent references and move toward the most dated
- Abstract or organize your literature
  - Locate, review, summarize, and classify references
  - Create a filing or organizational system
  - Write down the bibliographic information and where you found it in the library (saves
    time later if you need to find it again)
  - Summarize the article
  - Write down important quotes—write down the page number and biblio info
  - Index cards/Computer files—have a system to help you organize your information
Look for themes, topics, main ideas and organize your information around these, not around each article, study, or author (might also organize your information around an argument)

- **Analyzing, organizing, and reporting**
  - Documentation—document/cite all facts and interpretations
  - Formal language—define terms and make them clear
  - Use APA style
  - Outline the review
    - Group by topics
    - Identify heading and subheadings and where each reference fits (each reference may fit in more than one heading)
    - Analyze for similarities and differences—If three references say the same thing, there is no need to describe each one.
      - Ex: Several studies have found white chalk to be more effective than yellow chalk in the teaching of mathematics (Snurd, 1995; Trivia, 1994; Ziggy, 1984)
    - Discuss the least relevant topics/studies first followed by the most relevant studies—broad to narrow—like a funnel
  o Start each major section of the review with an introduction that provides a brief overview of the section. “In this section, three main issues are examined...” You should do this at the beginning of each chapter as well.
    - Tell them what you are going to tell them, tell them, and then tell them what you just told them.
  o End major sections or chapters with a summary of the main ideas, findings, or points.

**Differences in qualitative and quantitative reviews:**
Sometimes qualitative reviews are limited or ongoing throughout the entire study reflecting the need to understand the data as it is collected, interpreted, and synthesized. Also, this will prevent researcher’s tainting how they see things. Quantitative reviews are always done prior to collecting any data.

**Mistakes often made in the literature review:**
- Review is done too quickly—important work is overlooked.
- Too heavy reliance on secondary sources.
- Too much concentration on findings—misses information on methods.
- Overlook sources other than Education journals.
- Searches too broad an area.
- Incomplete or improper documentation of sources.
- Extracts too much material from the articles.
- Poor organization
  o You should start with least relevant to most relevant to your study and the problem
  o Use chronology as well
- Be careful of the age of your sources
- Was past research done correctly?
FORMULATING AND STATING A HYPOTHESIS
A hypothesis is a researcher’s tentative prediction of the results of the research findings. It states the researcher’s expectations about the relationship between two variables in the research topic. (Definition by Gay and Airasian)

A hypothesis is usually derived from a theory or a review of the literature. The review might inform you and lead you to expect a certain relationship or outcome.

Typically, especially when doing statistical analyses, hypotheses precede the conduct of the study because participants, instruments, design, procedures, data analysis, and conclusions are all affected by the hypotheses. (more quantitative)

When statistical analyses are not performed, hypotheses are not always stated. The point of the research may be to generate a hypothesis. (more qualitative)

A good hypothesis:
• Should be based on sound rationale (theory, previous research).
• Provides a reasonable explanation for the predicted outcome (it should not be way off base).
• Clearly and concisely states the expected relationship (or difference) between two variables and defines those variables in operational, that is, measurable, terms.
  o Hypothesis: Students with high math anxiety perform significantly better than students without math anxiety.
  o What is high math anxiety?
• Is testable in a reasonable time and by collecting and analyzing data (numerical and other).

Types of hypotheses:
• Inductive hypothesis: A generalization made from a number of observations.
• Deductive hypothesis: Derived from theory and aimed at providing evidence to support, expand, or contradict aspects of theory
• Research hypothesis: States the expected relationship or difference between two variables.
  o Nondirectional hypothesis: Statement that a relationship or difference exists between the variables.
    ▪ Ex: There is significant difference in the test scores of high school geometry students who participate in a Standards-based curriculum and those who participate in a non-Standard-based curriculum.
  o Directional hypothesis: Statement of the expected direction of the relationship or difference between variables.
    ▪ Ex: High school geometry students who participate in a Standards-based curriculum have significantly higher test scores than those who participate in a non-Standards-based curriculum.
  o Null hypothesis: A statement that no statistically significant relationship of difference exists between variables.
    ▪ Often used when there is little research or support for a hypothesis.
    ▪ Ex: There is no significant difference in the test scores of high school geometry students who participate in a Standards-based curriculum and those who participate in a non-Standards-based curriculum.
**Format:** P who get X do better on Y than P who do not get X.
  - P = participant
  - X = treatment
  - Y = outcome
  - Examples on pp. 65-66
  - Your hypotheses may also be like those you make in statistics.

Hypotheses are tested by **statistical analysis** of data.

**You do NOT prove a hypothesis!!** You only support or fail to support a hypothesis with your data. Nothing is every 100% guaranteed! Even with the best statistical models and analysis there is error involved.

Even if your data do not support your hypothesis does not mean you did not find anything important.