Practical Research: Planning and Design
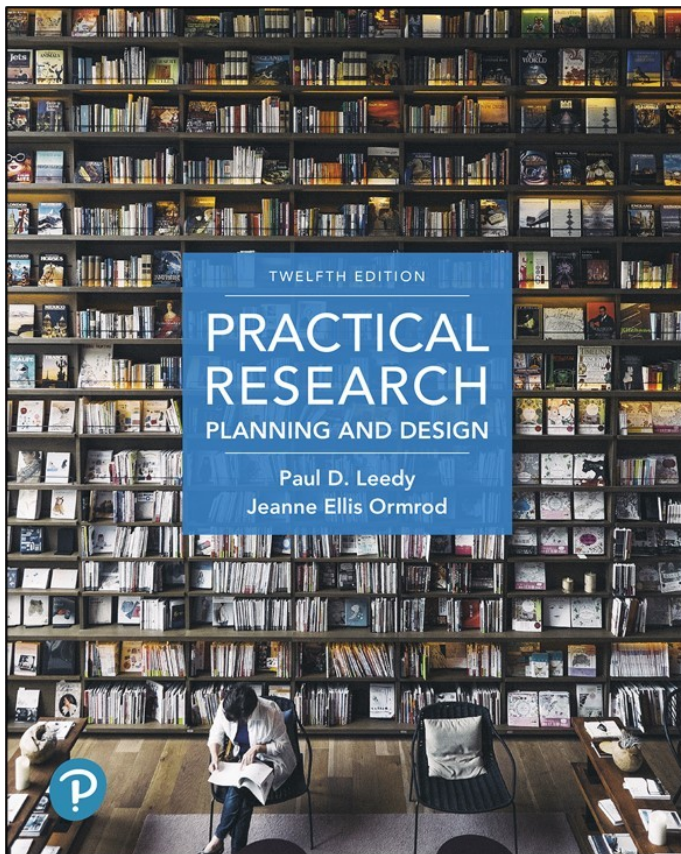
Twelfth Edition

Chapter 1

The Nature and Tools of Research
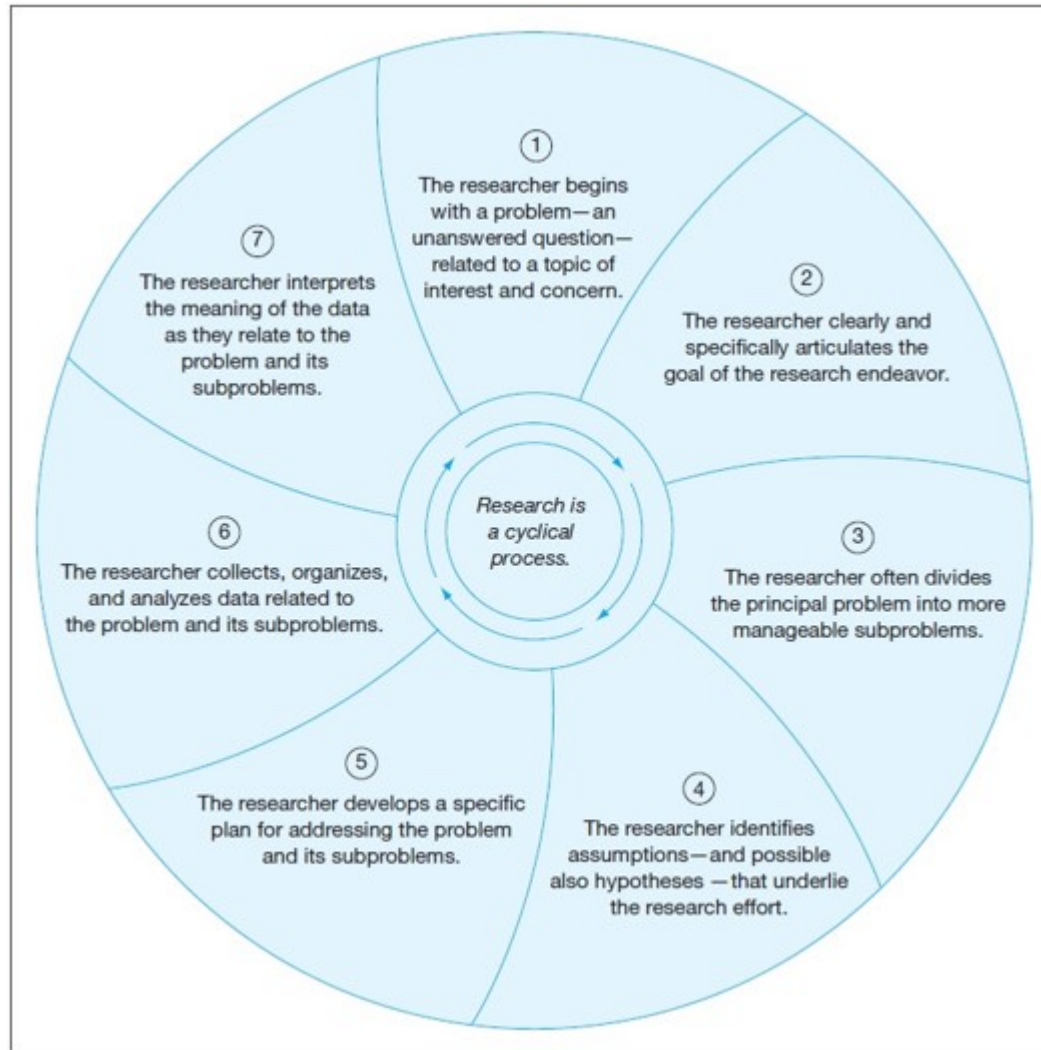
Research is

- NOT merely:
    - gathering information.
    - rummaging around for hard-to-locate information.
    - transporting facts from one location to another.

- "Research" is a word that is used loosely in everyday conversation and therefore must be defined clearly for professional use.

Research is

- A systematic process of
  - Collecting
  - Analyzing
  - Interpreting information (data)

- Goal: increase our understanding of a phenomenon about which we are interested or concerned

- Our focus is on **formal research**, or research intended to be communicated to a scientific community

Research is a Cyclical Process

1. The researcher begins with a problem—an unanswered question—related to a topic of interest and concern.
2. The researcher clearly and specifically articulates the goal of the research endeavor.
3. The researcher often divides the principal problem into more manageable subproblems.
4. The researcher identifies assumptions—and possible also hypotheses—that underlie the research effort.
5. The researcher develops a specific plan for addressing the problem and its subproblems.
6. The researcher collects, organizes, and analyzes data related to the problem and its subproblems.
7. The researcher interprets the meaning of the data as they relate to the problem and its subproblems.

Research is a cyclical process.

Pearson

Iterative Steps

- Identify a question or problem (unanswered question)

- Articulate a goal

- Divide the principal problem into more manageable subproblems

- Identify hypotheses and assumptions

- Develop a specific plan

- Collect, organize, and analyze data

- Interpret the data as they relate to the problem

Assumption

- An assumption is: Condition that is taken for granted.

- Two general assumptions that underlie most research projects:
  - The phenomenon under investigation is somewhat lawful and predictable.
  - Cause-and-effect relationships can account for certain patterns observed in the phenomenon.

Hypothesis

- A hypothesis is:
  - A logical supposition
  - A reasonable guess
  - An educated conjecture

- Provides a tentative explanation for a phenomenon under investigation

- May direct thinking to possible sources of information necessary to resolve the research problem and its subproblems

Hypothesis (2 of 2)

- Hypotheses are not unique to research. Just imagine any time you've made a "guess" about the cause of some phenomenon.

- Hypotheses that are proposed prior to any data collection are called a **priori** hypotheses.

Types of Research

- Quantitative Research
  - Involves looking at amounts, or quantities, of one or more variables of interest

- Qualitative Research
  - Involves looking at characteristics, or qualities, that cannot be entirely reduced to numerical values

- Mixed Method Research
  - Uses a combination of quantitative and qualitative methods

- Action Research
  - Focused on outcomes for the practitioner

Philosophical Orientations Toward Research (1 of 3)

- Positivism
  - with appropriate measurement tools, scientists can objectively uncover absolute, undeniable truths about cause-and-effect relationships within the physical world and human experience.

- Postpositivism
  - true objectivity in seeking absolute truths can be an elusive goal and researchers bring biases to their work.

Philosophical Orientations Toward Research

- Constructivism
  - no absolute truth — the "realities" researchers identify are simply human-created perceptions and interpretations.

- Phenomenology
  - focus is entirely on how human beings **experience** themselves and their world as they go through life.

Philosophical Orientations Toward Research (3 of 3)

- Pragmatism/realism
  - absolute truths may actually exist—even if they are exceedingly difficult to discover.
  - human beings' self-constructed beliefs about phenomena are legitimate objects of study in their own right.

Tools of Research

- Specific mechanisms or strategies used to collect, manipulate, or interpret data
  - The library and its resources
  - Computer technology
  - Measurement
  - Statistics
  - Language
  - The human mind

- Methodology dictates the tools the researcher selects

Library and its Resources

- Access to books, microforms, CDs, DVDs, online databases

- Fast and efficient means of locating and accessing information

- Access to library holdings around the world

Computer Technology is Used for

- Generating and organizing ideas

- Scheduling, structuring, and coordinating projects

- Finding literature

- Networking with others

- Storing and analyzing data

- Writing, editing, formatting

- Producing graphics

- Presenting results

Measurement

- Usually used in quantitative research

- More difficult for qualitative research

- Common instruments
  - Scales
  - Rulers
  - Stopwatches

- Specialized instruments
  - Telescope
  - MRI

Main Functions of Statistics

- Describe the data
  - Descriptive statistics summarize the general nature of the data obtained

- Draw inferences from the data
  - Inferential statistics help the researcher make decisions about the data

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Language as a Tool

- Allows us to communicate and think more effectively
  - reduces complexity of the world
  - allows abstraction of the environment
  - enhances the power of thought
  - facilitates generalizations and drawing inferences

Communicating Effectively through Writing (1 of 2)

- Be specific and precise: Say exactly what you mean

- Keep your primary objective in mind at all times

- Provide an overview of what you will be discussing

- Organize ideas into categories by using headings and subheadings

- Use concrete examples to make abstract ideas more understandable

Communicating Effectively through Writing (2 of 2)

- Use figures and tables

- Regularly summarize what you've said

- Anticipate having to write multiple drafts

- Check your final draft
  - Grammar
  - Punctuation
  - Spelling

Using the Tools in Word-Processing Software

- Beyond the basic tools of word-processing software, the following are also quite helpful:
  - Outlining
  - Setting headers and footers
  - Creating tables
  - Inserting graphics
  - Creating footnotes
  - Using international alphabets and characters
  - Tracking changes

Using the Tools in Word-Processing Software

- General recommendations for using a word-processor effectively:
    - Save and backup your document frequently.
    - Use spell checker and grammar checker but don't rely on them exclusively
    - Print out a paper copy for final proofreading and editing

The Human Mind (1 of 5)

- The most important tool in the researcher's toolbox

- Used for critical thinking

- Evaluates
  - Accuracy
  - credibility
  - worth of information
  - lines of reasoning

- Evaluation may take a variety of forms:
    - verbal reasoning
    - argument analysis
    - probabilistic reasoning
    - decision making
    - hypothesis testing

The Human Mind

- Deductive logic
  - Begins with one or more premises, statements or assumptions that the researcher initially takes to be true
  - Valuable for generating research hypotheses and testing theories

- Inductive reasoning
  - Begins with an observation (sample)
  - Observation then used to draw conclusions about entire classes of objects or events (population)

The Human Mind

- Scientific method
  - Process of collecting & analyzing data systematically
  - Involves thinking actively and intentionally
  - Yields hypotheses

- Theory Building
  - An organized body of concepts and principles
  - Intended to explain a particular phenomenon

The Human Mind (5 of 5)

- Collaboration with other minds
  - Increases variety of
    - Perspectives
    - Backgrounds
    - Areas of expertise
  - May reduce bias

Exploring Research In Your Field

- Juried (or **refereed**) research report
  - Judged by experts in the field and deemed to be of sufficient quality and importance to warrant publication.
- Nonjuried (or **nonrefereed**) report
  - Appears in a journal or on the Internet without having been reviewed or selected by experts.
  - Some nonjuried reports are excellent, but others may not be.

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