Educational Research Quantitative Qualitative and Mixed Approaches 6th edition Johnson Solutions Manual

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Chapter 2: Quantitative, Qualitative, and Mixed Research
Lecture Notes

This chapter presents an introduction to the three major research methodology paradigms: quantitative, qualitative, and mixed. The characteristics and applications of each paradigm are discussed. The concept of a variable is introduced and the role of variables in quantitative research is discussed. Experimental and nonexperimental quantitative studies are compared. Correlation coefficients are explained both conceptually and practically. Qualitative and mixed research methods are also discussed.

Characteristics of the Three Research Paradigms

- *Quantitative research*—research that relies primarily on the collection of quantitative data. (Note that *pure* quantitative research will follow all of the paradigm characteristics of quantitative research shown in the left column of Table 2.1.)
- *Qualitative research*—research that relies on the collection of qualitative data. (Note that *pure* qualitative research will follow all of the paradigm characteristics of qualitative research shown in the right column of Table 2.1.)
- *Mixed research*—research that involves the mixing of quantitative and qualitative methods or paradigm characteristics. The mixing of quantitative and qualitative research can take many forms. In fact, the possibilities for mixing are almost infinite.

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TABLE 2.1 Emphases of Quantitative, Mixed, and Qualitative Research

	Quantitative Research	*Mixed Research*	*Qualitative Research*
Scientific method	Confirmatory or "top-down" The researcher *tests* hypotheses and theory with data.	Confirmatory and exploratory	Exploratory or "bottom-up" The researcher *generates* or *constructs* knowledge, hypotheses, and grounded theory from data collected during fieldwork.
Ontology (i.e., nature of reality/truth)	Objective, material, structural, agreed-upon	Pluralism; appreciation of objective, subjective, and intersubjective reality and their interrelations	Subjective, mental, personal, and constructed
Epistemology (i.e., theory of knowledge)	Scientific realism; search for Truth; justification by empirical confirmation of hypotheses; universal scientific standards	Dialectical pragmatism; pragmatic justification (what works for whom in specific contexts); mixture of universal (e.g., *always* be ethical) and community-specific needs-based standards	Relativism; individual and group justification; varying standards
View of human thought and behavior	Regular and predictable	Dynamic, complex, and partially predictable Multiple influences include environment/nurture, biology/nature, freewill/agency, and chance/fortuity.	Situational, social, contextual, personal, and unpredictable
Most common research objectives	Quantitative/numerical description, causal explanation, and prediction	Multiple objectives; provide complex and fuller explanation and understanding; understand multiple perspectives	Qualitative/subjective description, empathetic understanding, and exploration
Interest	Identify general scientific laws; inform national policy.	Connect theory and practice; understand multiple causation, nomothetic (i.e., general) causation, and idiographic (i.e., particular, individual) causation; connect national and local interests and policy.	Understand and appreciate particular groups and individuals; inform local policy.
"Focus"	Narrow-angle lens, testing specific hypotheses	Multilens focus	Wide-angle and "deep-angle" lens, examining the breadth and depth of phenomena to learn more about them
Nature of observation	Study behavior under controlled conditions; isolate the causal effect of single variables.	Study multiple contexts, perspectives, or conditions; study multiple factors as they operate together.	Study groups and individuals in natural settings; attempt to understand insiders' views, meanings, and perspectives.
Form of data collected	Collect quantitative data based on precise measurement using structured and validated data-collection instruments.	Collect multiple kinds of data.	Collect qualitative data such as in-depth interviews, participant observation, field notes, and open-ended questions. The researcher is the primary data-collection instrument.
Nature of data	Variables	Mixture of variables, words, categories, and images	Words, images, categories
Data analysis	Identify statistical relationships among variables.	Quantitative and qualitative analysis used separately and in combination.	Use descriptive data; search for patterns, themes, and holistic features; and appreciate difference/variation.

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Results	Generalizable findings providing representation of objective outsider viewpoint of populations	Provision of "subjective insider" and "objective outsider" viewpoints; presentation and integration of multiple dimensions and perspectives	Particularistic findings; provision of insider viewpoints
Form of final report	Formal statistical report (e.g., with correlations, comparisons of means, and reporting of statistical significance of findings)	Mixture of numbers and narrative	Informal narrative report with contextual description and direct quotations from research participants

Quantitative Research Methods: Experimental and Nonexperimental Research

The basic building blocks of quantitative research are variables.

- *Variables* (something that takes on different values or categories)
  - *Variables* are the opposite of *constants* (something that cannot vary, such as a single value or category of a variable).
- Many of the important types of variables used in quantitative research are shown in Table 2.2.

TABLE 2.2 Common Types of Variables Classified by Level of Measurement and by Role of Variable

Variable Type	*Key Characteristic*	*Example*
Level of Measurement		
Categorical variable	A variable that is made up of different types or categories of a phenomenon	The variable *gender* is made up of the categories of male and female.
Quantitative variable	A variable that varies in degree or amount of a phenomenon	The variable *annual income* varies from zero income to avery high income level.
Role Taken by the Variable		
Independent variable (symbolized as IV)	A variable that is presumed to cause changes to occur in another variable, a causal variable	Amount of studying (IV) affects test grades (DV).
Dependent variable (symbolized as DV)	A variable that changes because of another variable, the effect or outcome variable	Amount of studying (IV) affects test grades (DV).
Mediating variable (It is also called an intervening variable)	A variable that comes in between other variables, helps to delineate the process through which variables affect one another	Amount of studying (IV) leads to input and organization of knowledge in long-term memory (mediating variable), which affects test grades (DV).
Moderator variable	A variable that delineates how a relationship of interest changes under different conditions or circumstances	Perhaps the relationship between studying (IV) and test grades (DV) changes according to the different levels of use of a drug such as Ritalin (moderator).
Extraneous variable	A variable that may compete with the independent variable in explaining an outcome	Perhaps an observed relationship between coffee drinking (IV) and cancer (DV) is actually due to smoking cigarettes

- As seen in Table 2.2, variables can be categorized based on how they are measured and the role they play.
  - The simplest classification involves the level of measurement of the variable.
    - Q*uantitative variables* vary in degree or amount (e.g., annual income).
    - *Categorical variables* vary in type or kind (e.g., gender).
  - Another way to categorize variables is based upon the roles they take on in quantitative research studies.
    - I*ndependent variables* (symbolized by "**IV**") are the presumed cause of another variable.

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- *Dependent variables* (symbolized by "**DV**") are the presumed effect or outcome. They are influenced by one or more independent variables.
- *Extraneous variables*—variables that compete with the independent variable in explaining the outcome. Claims about cause and effect (i.e., that changes in an IV cause changes in a DV) must rule out *extraneous variables*.
- *Intervening variables* (also called mediator or mediating variables)—variables that occur between two other variables.
- *Moderator variables*—a relationship between variables changes under certain conditions or circumstances.

Experimental Research

- The purpose of experimental research is to study cause and effect relationships between the IV and DV.
  - Accomplished through active manipulation of an independent variable (i.e., it is only in experimental research that "manipulation" is present).
  - Random assignment (which creates "equivalent" groups) is used in the strongest experimental research designs.
  - Experiments are required to investigate cause and effect relationships between variables.
  - *Extraneous variable*—a variable that may compete with the independent variable in explaining the outcome.
  - *Confounding variable*—an extraneous variable that was not controlled for and altered the relationship between the IV and DV.
- General steps in experimental research
  1. Create groups of participants that are approximately the same by using random assignment (i.e., the groups are "equated").
  2. Pretest the participants to measure the variable before manipulating the IV.
  3. Manipulate the IV by doing something different with the groups
  4. Measure the participants on the DV to see if there are differences between the groups on the DV. If there is a difference between the groups, assume that the IV manipulation lead to the difference in the DV.

Nonexperimental Research

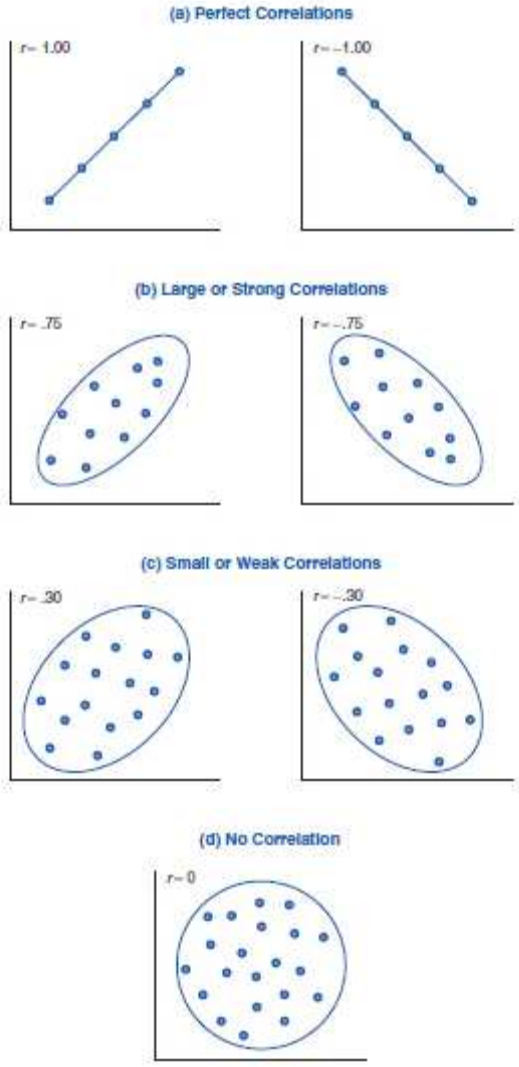
- There is NO manipulation of the independent variable. There is No random assignment of participants to groups.
  - As a result of no manipulation in the IV and no random assignment to groups, it is harder to look at causality.
- *Causal-comparative research*—nonexperimental research involving a categorical IV.
  - Example: Gender (IV) and class performance (DV).
    - You would look for the relationship by comparing the male and female students' average performance levels.
    - The word "causal" is misleading. Because there is no manipulation of the IV and because it is more difficult to control for extraneous variables in nonexperimental research, cause and effect is more difficult to determine in causal-comparative research.
    - Gender would not cause differences in performance levels, but the two genders might differ in performance levels.

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- *Correlational research*—nonexperimental research involving one quantitative IV and one qualitative DV.
  - Example: Self-esteem (IV) and class performance (DV).
  - You would look for the relationship by calculating the correlation coefficient between participants' self-esteem scores and class performance scores.
    - The correlation coefficient is a number that varies between –1 and +1. 0 stands for no relationship. The farther the number is from 0, the stronger the relationship.
    - If the sign of the correlation coefficient is positive (e.g., +.65) then you have a positive correlation, which means the two variables move in the same direction (as one variable increases, so does the other variable). Education level and annual income are positively correlated (i.e., the higher the education, the higher the annual income).
    - If the sign of the correlation coefficient is negative (e.g., -.71) then you have a negative correlation, which means the two variables move in opposite directions (as one variable increases, the other decreases). Smoking and life expectancy are negatively correlated (i.e., the higher the smoking, the lower the life expectancy).
  - Correlation coefficients are summarized in Figure 2.3.

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■ FIGURE 2.3 Correlations of different strengths and directions



- Important points to remember about nonexperimental research:
  - You can obtain much stronger evidence for causality from experimental research than from nonexperimental research (e.g., a strong experiment is better than causal-comparative and correlation research).
  - You cannot conclude that a relationship is causal when you only have one IV and one DV in nonexperimental research (without controls). Therefore, the basic cases of both causal-comparative and correlation research are severely flawed!
  - In later chapters, we explain three necessary conditions for causality (relationship, temporal order, and lack of alternative explanations).

Qualitative Research Methods

- There are six major types of qualitative research: phenomenology, ethnography, narrative inquiry, case study research, grounded theory, and historical research.
- *Phenomenology*—a form of qualitative research in which the researcher attempts to understand how one or more individuals experience a phenomenon. For example, you

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might interview 20 widows and ask them to describe their experiences of the deaths of their husbands.

- *Ethnography*—is the form of qualitative research that focuses on describing the culture of a group of people. Note that a *culture* is the shared attitudes, values, norms, practices, language, and material things of a group of people. For an example of ethnography, you might decide to go and live in a Mohawk community and study the culture and their educational practices.
- *Narrative inquiry research*—a form of qualitative research in which participants tell stories of their experiences. The goal is for the researcher to develop a narrative account of the participant's storied experience. For example, you might study students' experiences in schools through the stories they tell about school.
- *Case study research*—is a form of qualitative research that is focused on providing a detailed account of one or more cases. For an example, you might study a classroom that was given a new curriculum for technology use.
- *Grounded theory*—is a qualitative approach to generating and developing a theory from data that the researcher collects. For an example, you might collect data from parents who have pulled their children out of public schools and develop a theory to explain how and why this phenomenon occurs, ultimately developing a theory of school pull-out.

Mixed Research

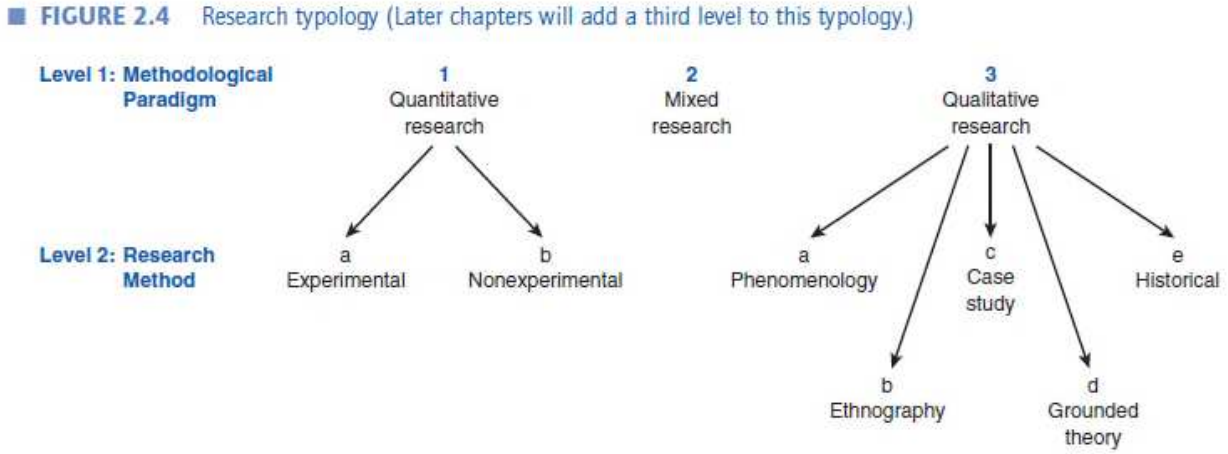
- *Mixed research* is the third paradigm of research in which quantitative and qualitative methods, techniques, or other paradigm characteristics are mixed in one overall study.
  - We advocate the use of mixed research when it is feasible because we believe it will help qualitative and quantitative researchers to get along better and, more importantly, it will promote the conduct of excellent educational research
- Advantages of Mixed Research
  - *Fundamental principle of mixed research*—researchers should mix quantitative and qualitative research methods, procedures, and paradigm characteristics so that the resulting mixture or combination has complementary strengths and nonoverlapping weaknesses.
  - *Complementary strengths*—the whole is greater than the sum of its pars
    - Here is a metaphor for thinking about mixed research: Construct one fish net out of several fish nets that have holes in them by laying them on top of one another. The "new" net will not have any holes in it. The use of multiple methods or approaches to research works the same way.
  - When different approaches are used to focus on the same phenomenon and they suggest the same conclusion, you have "corroboration" which means you have superior evidence for the claim. Other important reasons for doing mixed research that also follow from the fundamental principle are complementarity via multiple perspectives, complementarity via expanding the results, and complementarity via discovery of things that would have been missed if only a quantitative or a qualitative approach had been used.
  - Some researchers like to conduct mixed research in a single study, and this is what is truly called *mixed research*. However, it is interesting to note that many if not most research literatures are mixed at the aggregate level, even if no single

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researcher uses mixed research. That is because there will usually be some quantitative and some qualitative research studies in a research literature.

Our Research Typology

We have now covered the essentials of the three research methodology paradigms and their subtypes. Let us put it all together in the following picture of our research typology:



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Chapter 2: Quantitative, Qualitative, and Mixed Research

Answers to Review Questions

2.1. What are the key features of quantitative and qualitative research?

Just look at Table 2.1, which shows the key characteristics of these two approaches in their pure or extreme forms as well as the characteristics of mixed research. I will mention a few of these here. Quantitative research uses the deductive or confirmatory or "top down" scientific method; it is used primarily for description, explanation, and prediction. It is based on quantitative data, in particular on the analysis of variables. The results describe statistical relationships and a goal is to *generalize* the results. In qualitative research, in contrast, the "bottom up" or inductive exploratory method is used; it is used primarily for the purposes of description and exploration and to gain an understanding of how people think and experience their lives. It is based on qualitative data which during analysis are examined for patterns, themes, and holistic features. A narrative report is presented and generalization is usually not a goal because the focus is on the local, the personal, and the subjective.

Here is Table 2.1 on the two next pages for your convenience:

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	Quantitative Research	*Mixed Research*	*Qualitative Research*
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Epistemology (i.e., theory of knowledge)	Scientific realism; search for Truth; justification by empirical confirmation of hypotheses; universal scientific standards	Dialectical pragmatism; pragmatic justification (what works for whom in specific contexts); mixture of universal (e.g., *always* be ethical) and community-specific needs-based standards	Relativism; individual and group justification; varying standards
View of human thought and behavior	Regular and predictable	Dynamic, complex, and partially predictable Multiple influences include environment/nurture, biology/nature, freewill/agency, and chance/fortuity.	Situational, social, contextual, personal, and unpredictable
Most common research objectives	Quantitative/numerical description, causal explanation, and prediction	Multiple objectives; provide complex and fuller explanation and understanding; understand multiple perspectives	Qualitative/subjective description, empathetic understanding, and exploration
Interest	Identify general scientific laws; inform national policy.	Connect theory and practice; understand multiple causation, nomothetic (i.e., general) causation, and idiographic (i.e., particular, individual) causation; connect national and local interests and policy.	Understand and appreciate particular groups and individuals; inform local policy.
"Focus"	Narrow-angle lens, testing specific hypotheses	Multilens focus	Wide-angle and "deep-angle" lens, examining the breadth and depth of phenomena to learn more about them
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Form of data collected	Collect quantitative data based on precise measurement using structured and validated data-collection instruments.	Collect multiple kinds of data.	Collect qualitative data such as in-depth interviews, participant observation, field notes, and open-ended questions. The researcher is the primary data-collection instrument.
Nature of data	Variables	Mixture of variables, words, categories, and images	Words, images, categories
Data analysis	Identify statistical relationships among variables.	Quantitative and qualitative analysis used separately and in combination.	Use descriptive data; search for patterns, themes, and holistic features; and appreciate difference/variation.

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Results	Generalizable findings providing representation of objective outsider viewpoint of populations	Provision of "subjective insider" and "objective outsider" viewpoints; presentation and integration of multiple dimensions and perspectives	Particularistic findings; provision of insider viewpoints
Form of final report	Formal statistical report (e.g., with correlations, comparisons of means, and reporting of statistical significance of findings)	Mixture of numbers and narrative	Informal narrative report with contextual description and direct quotations from research participants

2.2. What are the key features of mixed methods research?

Mixed research is the third and newest research methodology paradigm. As you can see in Table 2.1 it tries to mix the best of qualitative and quantitative research into research studies. Philosophically, mixed research takes an eclectic, pragmatic, and commonsense approach, suggesting that the researcher mixes quantitative and qualitative in a way that works best for the given research question being studied in a particular context. Mixed research often uses both deductive and inductive methods, obtains both quantitative and qualitative data, attempts to corroborate and complement findings, and takes a balanced approach to research. Later in the chapter you will learn about the *fundamental principle of mixed research* which states that when planning and conducting mixed research, the researcher should mix methods or procedures in a way that the resulting mixture or combination has complementary strengths (broadly viewed) and nonoverlapping weaknesses.

2.3. What is the difference between a categorical variable and a quantitative variable? Think of an example of each.

A categorical variable varies in type or kind and a quantitative variable varies in degree or amount. An example of the former is gender, and an example of the latter is class size.

2.4. Why is experimental research more effective than nonexperimental research when a researcher is interested in studying cause and effect?

Strong experimental research designs (i.e., the best experiments) include both manipulation and random assignment; *nonexperimental research has neither of these*. "Manipulation" is an action taken by the researcher in the world (e.g., providing a treatment to one group and a control condition to another group); manipulation allows us to see a manipulation first, and then observe the outcome or result of the manipulation. "Random assignment" makes the groups similar on ALL extraneous variables at the beginning of the experiment; hence, the only difference between the groups will be the level of independent variable received, allowing the differences observed after the experiment is completed to be attributed to the manipulated independent variable.

2.5. What are the main problems with the simple cases of causal-comparative and correlational research?

The problem with BOTH of these simple cases is that the researcher has no manipulation and no random assignment, and is only able to determine whether a statistical relationship

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is present. Observing a relationship is NOT enough information to attribute causation! To make a causal attribution, you need to meet three conditions: (1) show that there is a relationship; (2) show that you have the correct time ordering of your variables, that is, if A causes B then A must precede B in time; and (3) all alternative explanations must be ruled out. Again, all the simple cases give us is a relationship (i.e., condition 1). (On the other hand, a well-conducted strong experiment satisfies all three conditions.)

2.6 What are two variables that you believe are positively correlated?

Study time the night before an exam and test grades (i.e., the greater the study time, the higher the grades).

2.7. What are two variables that you believe are negatively correlated?

Amount of time spent partying the night before a test and test grades (i.e., the greater the time spent partying, the lower the grades).

2.8. What are the different types of qualitative research, and what is the defining feature of each of these?

The types are phenomenology, ethnography, narrative inquiry, case study research, and grounded theory research. Here are the definitions, with the key ideas underlined:
(a) Phenomenology: A form of qualitative research in which the researcher attempts to understand how one or more individuals experience a phenomenon.
(b) Ethnography: A form of qualitative research focused on describing the culture of a group of people.
(c) Narrative inquiry: A form of qualitative research that is focused on the study of life experiences as storied phenomenon.
(d) Case study research: A form of qualitative research that is focused on providing a detailed account of one or more cases.
(e) Grounded theory research: A qualitative approach to generating a theory from the data that the researcher collects.

2.9. What is mixed research, and what is an example of this kind of research?

Mixed research (also commonly called mixed methods research) is research in which the researcher uses a combination of quantitative and qualitative approaches in a single research study. Example: study the members of the snake handling churches in the Southern Tennessee/West Georgia using participant observation and using quantitative measurement instruments to profile the participants on variables of interest. Both sorts of data will likely provide useful information.

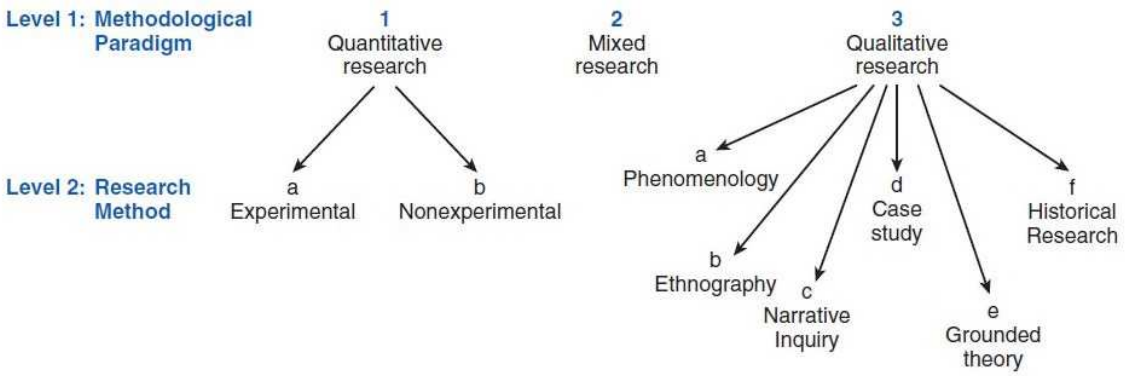
2.10. What are the three research paradigms in education and what are the major types of research in each of these paradigms? (Hint: See Figure 2.4.)

They are quantitative research, qualitative research, and mixed research.
Quantitative research has two major subtypes: experimental and nonexperimental research. **Qualitative research** has six major subtypes: phenomenology, ethnography, narrative inquiry, case study, grounded theory, and historical research. **Mixed methods research** uses a combination of quantitative and qualitative research methods.

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Here is Figure 2.4 for your convenience.

■ **FIGURE 2.4** Research typology (Later chapters will add a third level to this typology.)



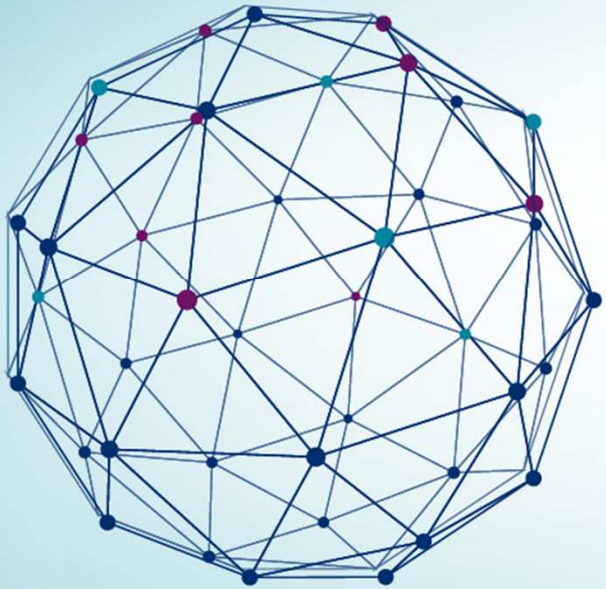
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EDUCATIONAL RESEARCH 6 edition

Quantitative, Qualitative, and Mixed Approaches

Chapter 2
Quantitative, Qualitative, and Mixed Research



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Three Research Methodology Paradigms

- *Paradigm* – perspective based on set of assumptions, concepts, and values that are held and practiced by a community of researchers.

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Three Research Methodology Paradigms (cont.)

- During most of the 20th century, quantitative was dominant.
- During the 1980s, qualitative became increasingly popular as alternative to quantitative.
- During the 21st century, mixed research has become increasingly popular as alternative to quantitative and qualitative.
  - Mixed research is a unique paradigm – it uses both quantitative and qualitative.

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Characteristics of the Three Research Paradigms

- *Quantitative research* – research that relies primarily on quantitative data.
  - *Pure* quantitative follows all of the paradigm characteristics of quantitative.
- *Qualitative research* – research that relies on qualitative data.
  - *Pure* qualitative research follows all of the paradigm characteristics of qualitative.
- *Mixed research* – mixing of quantitative and qualitative methods or other paradigm characteristics.
  - The possibilities for mixing are almost infinite.

See Table 2.1 Emphases of Quantitative, Mixed, and Qualitative Research in textbook

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Quantitative Research Methods: Experimental and Nonexperimental

Basic building blocks of quantitative research are variables.

- *Variables* (take on different values or categories).

- *Constants* (single value or category of variable).

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Table 2.2 Common Types of Variables Classified by Level of Measurement and by Role of Variable

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Variable Type	*Key Characteristic*	*Example*
Level of Measurement		
Categorical variable	A variable that is made up of different types or categories of a phenomenon	The variable *gender* is made up of the categories of male and female.
Quantitative variable	A variable that varies in degree or amount of a phenomenon	The variable *annual income* varies from zero income to a very high income level.
Role Taken by the Variable		
Independent variable (symbolized as IV)	A variable that is presumed to cause changes to occur in another variable, a causal variable	Amount of studying (IV) affects test grades (DV).
Dependent variable (symbolized as DV)	A variable that changes because of another variable, the effect or outcome variable	Amount of studying (IV) affects test grades (DV).
Mediating variable (It is also called an intervening variable)	A variable that comes in between other variables, helps to delineate the process through which variables affect one another	Amount of studying (IV) leads to input and organization of knowledge in long-term memory (mediating variable), which affects test grades (DV).
Moderator variable	A variable that delineates how a relationship of interest changes under different conditions or circumstances	Perhaps the relationship between studying (IV) and test grades (DV) changes according to the different levels of use of a drug such as Ritalin (moderator).
Extraneous variable	A variable that may compete with the independent variable in explaining an outcome	Perhaps an observed relationship between coffee drinking (IV) and cancer (DV) is actually due to smoking cigarettes

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Measurement Variable Types

- *Quantitative variables* vary in degree or amount (e.g., annual income).

- *Categorical variables* vary by type or kind (e.g., gender).

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Roles Taken by Variables

- *Independent variables* ("IV") – presumed cause of outcomes.

- *Dependent variables* ("DV") – presumed effect or outcome.
  - To make a cause and effect claim, you must rule out *extraneous variables* (variables competing with IV in explaining DV).
    - You will learn how to "control for" extraneous variables.

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Roles Taken by Variables (cont.)

- *Intervening variables* (also called mediator or mediating variables) occur between two other variables in a causal chain. A→B→C. B is intervening.
  - Perhaps pre-teaching (A) improves student motivation (B) which leads to higher test scores(C). (Student motivation in intervening variable).

- *Moderator variables* show how some relationships change across the levels of an additional variable.
  - Perhaps direct instruction works better reading instruction but discovery learning is superior for science instruction. (Academic content is moderator variable.)

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Major Types of Quantitative Research

- Experimental
- Nonexperimental

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Experimental Research

- Purpose – determine and demonstrate cause and effect relationships.
- Defining characteristic – active manipulation of an independent variable.
- Strongest experimental designs have random assignment (produces "equivalent" groups).

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Example of Experiment

Pretest	Treatment	Posttest
O1	XE	O2
O1	XC	O2

Where:

- E stands for experimental group (e.g., new teaching approach).
- C stands for control or comparison group (e.g., the old or standard teaching approach).
- O stands for measurement of DV.
- Best way to make the two groups similar at beginning is to *randomly assign* participants to groups.

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Logic of Experiment

1. Form similar groups at start (random assignment if possible).
2. Pretest participants on DV.
3. Manipulate IV.
4. Posttest participants on DV.

For example: try new teaching method with experimental group and do not change instruction for control group; see which group scores higher.

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Experimental Research

- Extraneous variable: variable that competes with independent variable in explaining outcome.

- Confounding variable: extraneous variable that was not controlled and leads to a “confounded” result.

- Control by random assignment to experimental and control groups.

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Nonexperimental Research

- By definition, nonexperimental has no manipulation of IV.
- Therefore, nonexperimental is not as good as experimental for studying cause and effect.
- Sometimes nonexperimental is categorized as *causal-comparative* (IV is categorical and DV is quantitative) or *correlational* (IV and DV quantitative).

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Nonexperimental Research (cont.)

In "simple case" of *causal-comparative research*, one categorical IV and one quantitative DV.

- Example: Gender (IV) and class performance (DV).
- Look for the relationship by comparing male and female participants' average performance levels.

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Nonexperimental Research (cont.)

In "simple case" of *correlational research*, one quantitative IV and one quantitative DV.

- Example: Self-esteem (IV) and class performance (DV).

- Look at the relationship between the variables by calculating the correlation coefficient.

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Correlation Coefficient

- Varies between –1 and +1, and 0 stands for no relationship.
- Two characteristics: strength and direction.
- Strength: the farther from 0, the stronger the relationship.
  - +1 and -1 are strongest.
- Direction:
  - If positive sign (+.65) positive correlation (two variables move in the same directions). High school GPA and SAT scores.
  - If negative sign (e.g., -.71) negative correlation (two variables move in opposite directions). Number of school absences and grades.

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Remember

1. Obtain MUCH stronger evidence for causality in experimental research than nonexperimental research. (Experimental is better for cause and effect!)

2. In nonexperimental: cannot conclude causation from relationship between one IV and one DV.

3. Three required conditions for causality: relationship, temporal order, and lack of alternative explanation.

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Remember (cont.)

- Experiments meet the three criteria for causality quite nicely.
- Simple cases of causal comparative and correlational studies do not.
- Simple cases of nonexperimental research can be improved (explained in Chapter 14).
- But remember: if you want to claim causation then CONDUCT AN EXPERIMENT.

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Qualitative Research Methods

- *Phenomenology* – attempts to understand how one or more individuals experience a phenomenon.
  - Example: interview 20 special education teachers who describe their experiences in the classroom.

- *Ethnography* – discovers and describes the cultural characteristics of group.
  - Note: *culture* is shared attitudes, values, norms, practices, language, and material things of a group of people.
  - Example: attend an inner city school and document culture and educational practices.

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Qualitative Research Methods (cont.)

- *Narrative Inquiry* – using stories to understand people's lived experiences.
  - Example*:* stories of students who have been successful in school.

- *Case study research* – provides detailed account of one or more cases.
  - Example: study classroom given new curriculum for technology use.

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Qualitative Research Methods (cont.)

- *Grounded theory* – inductively generates and develops a theory from data.
  - Example: collect data from parents who have pulled children from public schools and develop theory to explain how and why.

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Mixed Research

- Type of research in which quantitative and qualitative methods, techniques, or other paradigm characteristics are mixed in one overall study (or, occasionally, in a set of related studies).
  - Example: study the quantitative and qualitative aspects of a school.

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Mixed Research (cont.)

- *Fundamental principle of mixed research*: mix quantitative and qualitative methods, procedures, and paradigm characteristics to design studies with complementary strengths and nonoverlapping weaknesses.

- Metaphor: Construct fish net out of several fish nets that have holes. New net has no holes.

- Corroboration: different approaches provide same result.

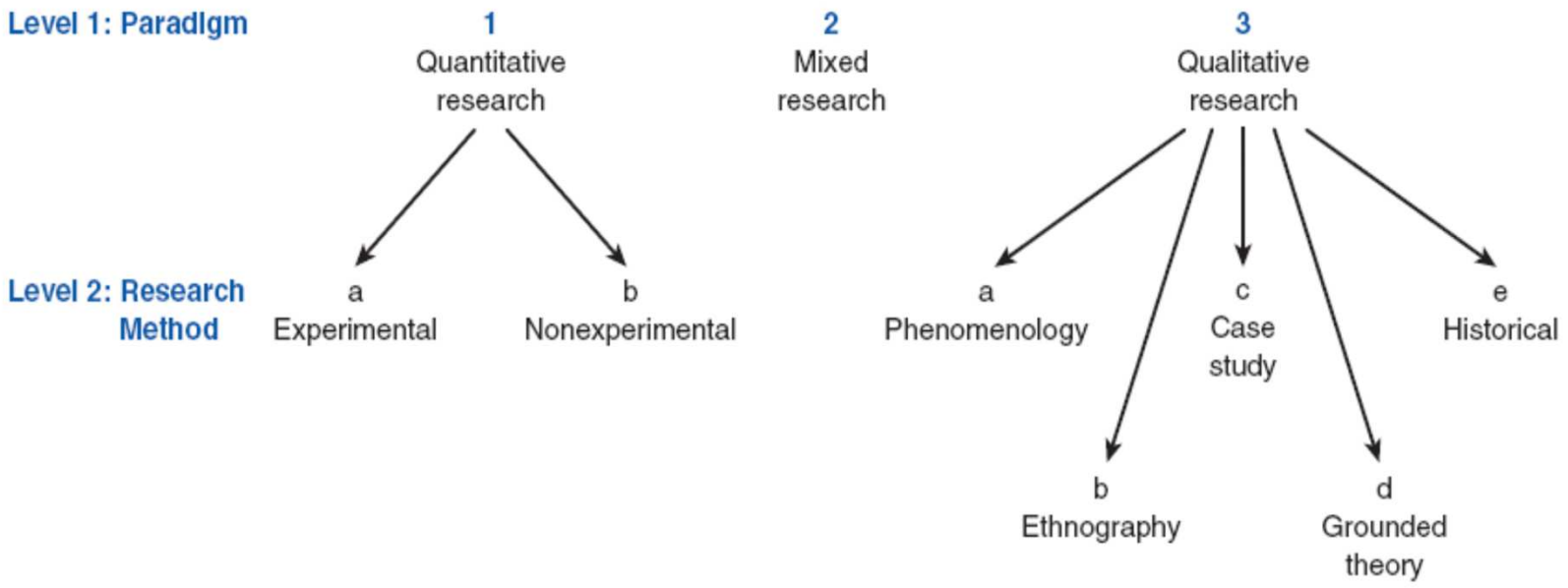
- Other purposes compatible with principle: complement via multiple perspectives, expanding results, and discovering what might be missed by using only one research method.

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Figure 2.4 Research Typology

■ **FIGURE 2.4**

Research Typology (Later chapters will add a 3rd level to this typology.)



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