

Chapter 14

Mixed Research: Mixed Method and Mixed Model Research

(Reminder: Don't forget to utilize the concept maps and study questions as you study this and the other chapters.)

This chapter is about mixed research. Mixed research is research in which quantitative and qualitative techniques are mixed in a single study. It is the third major research paradigm, adding an attractive alternative (when it is appropriate) to quantitative and qualitative research.

Proponents of mixed research typically adhere to the compatibility thesis as well as to the philosophy of pragmatism.

- The compatibility thesis is the idea that quantitative and qualitative methods are compatible, that is, they can both be used in a single research study.
- The philosophy of pragmatism says that researchers should use the approach or mixture of approaches that works the best in a real world situation. In short, what works is what is useful and should be used, regardless of any philosophical assumptions, paradigmatic assumptions, or any other type of assumptions. (Pragmatism was started by the great American philosophers Charles Sanders Peirce, William James, and John Dewey).

Today, proponents of mixed research attempt to use what is called the fundamental principle of mixed research.

- According to this fundamental principle, the researcher should use a mixture or combination of methods that has *complementary strengths and nonoverlapping weaknesses*.
- To aid you in applying this fundamental principle, we have provided tables that show the strengths and weaknesses of quantitative research and qualitative research. Here they are for your convenience:

■ **TABLE 14.1** Strengths and Weaknesses of Quantitative Research

Strengths

- Testing and validating already constructed theories about how and why phenomena occur
- Testing hypotheses that are constructed before the data are collected
- Can generalize research findings when the data are based on random samples of sufficient size
- Can generalize a research finding when it has been replicated on many different populations and subpopulations
- Useful for obtaining data that allow quantitative predictions to be made
- The researcher may construct a situation that eliminates the confounding influence of many variables, allowing one to more credibly establish cause-and-effect relationships
- Data collection using some quantitative methods is relatively quick (e.g., telephone interviews)
- Provides precise, quantitative, numerical data
- Data analysis is relatively less time consuming (using statistical software)
- The research results are relatively independent of the researcher (e.g., statistical significance)
- It may have higher credibility with many people in power (e.g., administrators, politicians, people who fund programs)
- It is useful for studying large numbers of people

Weaknesses

- The researcher's categories that are used might not reflect local constituencies' understandings
 - The researcher's theories that are used might not reflect local constituencies' understandings
 - The researcher might miss out on phenomena occurring because of the focus on theory or hypothesis testing rather than on theory or hypothesis generation (called the *confirmation bias*)
 - Knowledge produced might be too abstract and general for direct application to specific local situations, contexts, and individuals
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■ **TABLE 14.2** Strengths and Weaknesses of Qualitative Research

Strengths

- Data based on the participants' own categories of meaning
- Useful for studying a limited number of cases in depth
- Useful for describing complex phenomena
- Provides individual case information
- Can conduct cross-case comparisons and analysis
- Provides understanding and description of people's personal experiences of phenomena (i.e., the emic or insider's viewpoint)
- Can describe in rich detail phenomena as they are situated and embedded in local contexts
- The researcher almost always identifies contextual and setting factors as they relate to the phenomenon of interest
- The researcher can study dynamic processes (i.e., documenting sequential patterns and change)
- The researcher can use the primarily qualitative method of grounded theory to inductively generate a tentative but explanatory theory about a phenomenon
- Can determine how participants interpret constructs (e.g., self-esteem, IQ)
- Data are usually collected in naturalistic settings in qualitative research
- Qualitative approaches are especially responsive to local situations, conditions, and stakeholders' needs
- Qualitative researchers are especially responsive to changes that occur during the conduct of a study (especially during extended fieldwork) and may shift the focus of their studies as a result
- Qualitative data in the words and categories of participants lend themselves to exploring how and why phenomena occur
- You can use an important case to vividly demonstrate a phenomenon to the readers of a report
- Determine idiographic causation (i.e., determination of causes of a particular event)

Weaknesses

- Knowledge produced might not generalize to other people or other settings (i.e., findings might be unique to the relatively few people included in the research study).
 - It is difficult to make quantitative predictions.
 - It is more difficult to test hypotheses and theories with large participant pools.
 - It might have lower credibility with some administrators and commissioners of programs.
 - It generally takes more time to collect the data when compared to quantitative research.
 - Data analysis is often time consuming.
 - The results are more easily influenced by the researcher's personal biases and idiosyncrasies
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Here is a list of the strengths and weaknesses of mixed research. Looking at the strengths, you will see where you want to go in planning a mixed research study.

■ **TABLE 14.3** Strengths and Weaknesses of Mixed Research

Strengths

- Words, pictures, and narrative can be used to add meaning to numbers.
- Numbers can be used to add precision to words, pictures, and narrative.
- Can provide quantitative and qualitative research strengths (see strengths listed in Tables 14.1 and 14.2).
- Researcher can generate and test a grounded theory.
- Can answer a broader and more complete range of research questions because the researcher is not confined to a single method or approach.
- The specific mixed research designs discussed in this chapter have specific strengths and weaknesses that should be considered (e.g., in a two-phase sequential design, the phase one results can be used to develop and inform the purpose and design of the phase two component).
- A researcher can use the strengths of an additional method to overcome the weaknesses in another method by using both in a research study (this is the principle of complementarity).
- Can provide stronger evidence for a conclusion through convergence and corroboration of findings (this is the principle of triangulation).
- Can add insights and understanding that might be missed when only a single method is used.
- Can be used to increase the generalizability of the results.
- Qualitative and quantitative research used together produces more complete knowledge necessary to inform theory and practice.

Weaknesses

- It can be difficult for a single researcher to carry out both qualitative and quantitative research, especially if two or more approaches are expected to be done concurrently (i.e., it might require a research team).
 - The researcher has to learn about multiple methods and approaches and understand how to appropriately mix them.
 - Methodological purists contend that one should always work within either a qualitative or a quantitative paradigm.
 - It is more expensive.
 - It is more time consuming.
 - Some of the details of mixed research remain to be fully worked out by research methodologists (e.g., problems of paradigm mixing, how to qualitatively analyze quantitative data, how to interpret conflicting results).
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The Research Continuum

Research can be viewed as falling along a research continuum with “monomethod” research placed on the far left side, “fully mixed” research placed on the far right side, and “partially mixed” located in the center. You should be able to take any given research study and place it somewhere on the continuum.

■ FIGURE 14.1 The research continuum



Types of Mixed Research Methods

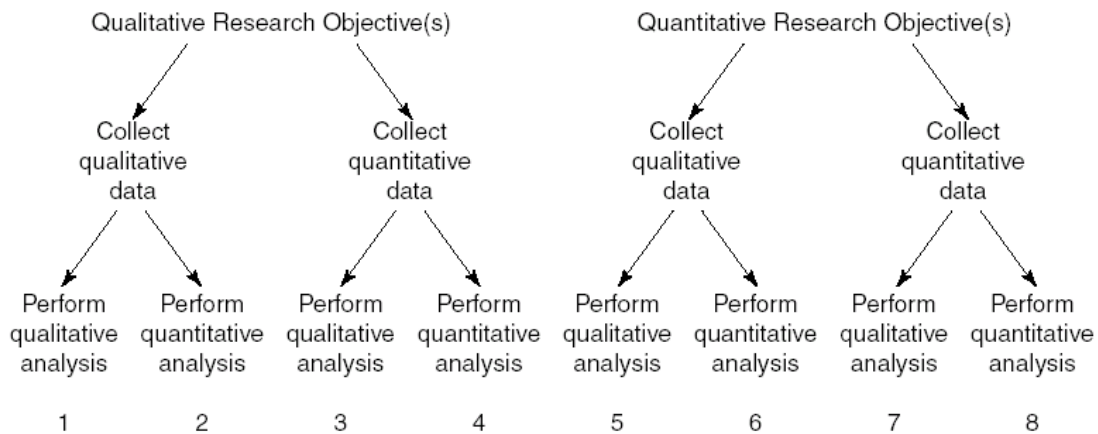
There are two major types of mixed research: they are mixed model research and mixed method research.

Mixed Model Research

In mixed model research *quantitative and qualitative approaches are mixed within or across the stages of the research process.*

Here are the two mixed model research subtypes: within-stage and across-stage mixed model research.

1. In within-stage mixed model research, quantitative and qualitative approaches are mixed *within one or more of the stages of research.*
 - An example of within-stage mixed model research would be where you used a questionnaire during data collection that included both open-ended (i.e., qualitative) questions *and* closed-ended (i.e., quantitative) questions.
2. In across-stage mixed model research, quantitative and qualitative approaches are mixed *across at least two of the stages of research.* Across-stage mixed model research designs are easily seen by examining designs 2 through 7 in Figure 14.2 (shown below):



■ **FIGURE 14.2** Monomethod and mixed model designs

Designs 1 and 8 on the outer edges are the monomethod designs. The mixed model designs are designs 2, 3, 4, 5, 6, and 7.

- Here is an example of across-stage mixed model research: A researcher wants to explore (qualitative objective) why people take on-line college courses. The researcher conducts open-ended interviews (qualitative data collection) asking them why they take on-line courses, and then the researcher quantifies the results by counting the number of times each type of response occurs (quantitative data analysis); the researcher also reports the responses as percentages and examines the relationships between sets of categories or variables through the use of contingency tables. Note that this is design 2 shown above in Figure 14.2.

Mixed Method Research

In mixed method research, a qualitative phase and a quantitative phase are included in the overall research study. It's like including a quantitative mini-study and a qualitative mini-study in one overall research study.

Mixed method research designs are classified according to two major dimensions:

1. Time order (i.e., concurrent versus sequential) and
2. Paradigm emphasis (i.e., equal status versus dominant status).

Below, in Figure 14.3, you can see the specific mixed method designs that result from crossing *time order* and *paradigm emphasis*. It is a 2-by-2 matrix, and it includes nine specific mixed method designs. In order to understand the designs, you need to first understand the notation that is used.

- QUAL and qual both stand for qualitative research.
- QUAN and quan both stand for quantitative research.
- Capital letters denote priority or increased weight.
- Lowercase letters denote lower priority or weight.
- A plus sign (+) indicated the concurrent collection of data.
- An arrow (→) represents a sequential collection of data.
- For example: qual→QUAN is a dominant status, sequential design where, the overall study is primarily quantitative but it is preceded

by a qualitative phase. Perhaps a researcher does an open-ended survey to find some important categories or variables that students say are important reasons for dropping out of on-line courses. Then in the quantitative phase the researcher does a quantitative study of predictors of dropping out, using quantitative statistical methods. In other words the quantitative phase was primary and the qualitative phase was supportive (and occurred first).

- In order to use Figure 14.3, you need to ask yourself two questions:
 1. Do you want to operate largely within one dominant paradigm or not (i.e., do you want to use a dominant status design or an equal status design?), and
 2. Do you want to conduct the phases concurrently (i.e., at roughly the same time) or sequentially (i.e., one before the other)?
 - Your answers to these two questions will lead you to one of the designs in Figure 14.3.
 - Your goal is to pragmatically design a study that fits your particular needs and circumstances.

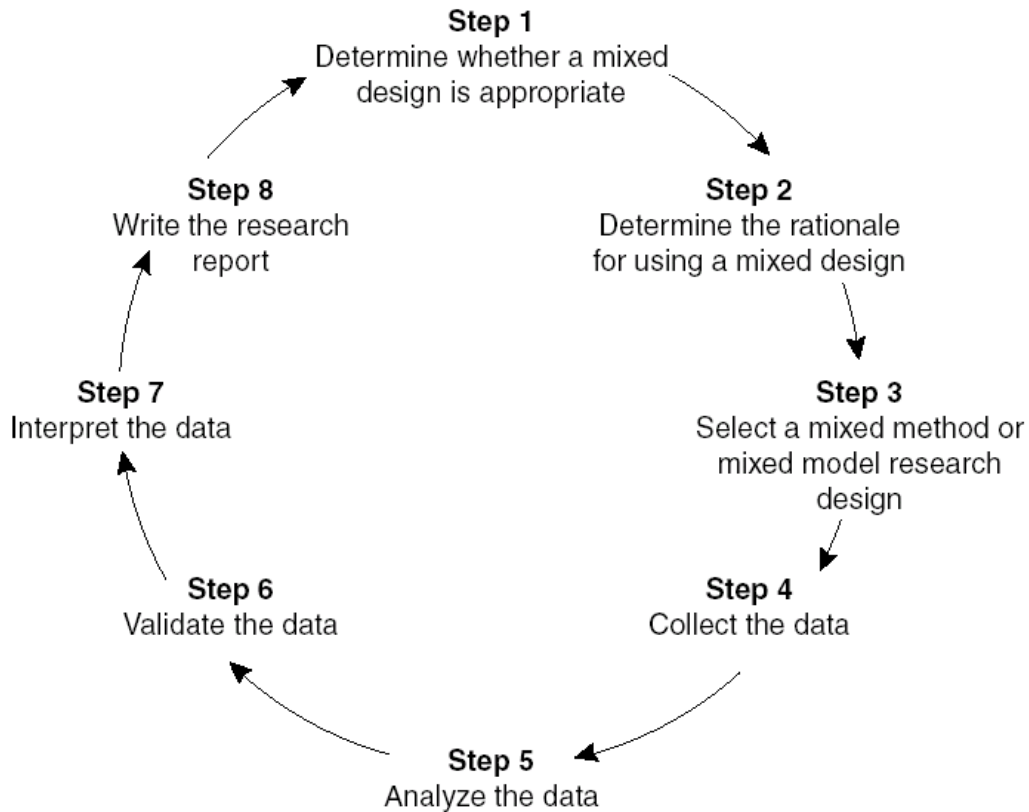
■ **FIGURE 14.3** Mixed method design matrix. Mixed method research designs are shown in the four cells.

		Time Order Decision	
		Concurrent	Sequential
Paradigm Emphasis Decision	Equal Status	QUAL + QUAN	QUAL → QUAN QUAN → QUAL
	Dominant Status	QUAL + quan QUAN + qual	QUAL → quan qual → QUAN QUAN → qual quan → QUAL

- It is important to understand that you are not limited to the mixed method or mixed model designs provided in this chapter. Our designs are provided to get you started. You should feel free to mix and match the designs into a design that best fits your needs. This includes designing studies that are a mix of mixed model and mixed method designs. Your goal, always, is to answer your research question(s) and then to design a study that will help you to do that.

Stages of Mixed Research Process

There are eight stages in the mixed research process, as shown in Figure 14.4 (in the text, and here for your convenience).



■ **FIGURE 14.4** Important steps in a mixed research study

Although the steps are numbered, researchers often move around in the circle in multiple directions (especially steps 4 through 7).

It is important to note that although the steps in mixed research are numbered, researchers often follow these steps in different orders, depending on what particular needs and concerns arise or emerge during a particular research study.

- For example, interpretation and validation of the data should be done throughout the data collection process.

I will *very* briefly comment on each of the eight (nonlinear) steps:

(1) Determine whether a mixed design is appropriate

- Do you believe that you can best answer your research question(s) through the use of mixed research?
- Do you believe that mixed research will offer you the best design for the amount and kind of evidence that you hope to obtain as you conduct your research study?

(2) Determine the rationale for using a mixed design

- The five most important rationales or purposes for mixed research are shown below in Table 14.4:

■ **TABLE 14.4** Greene, Caracelli, and Graham's List of Purposes for Mixed Research

Purpose	Explanation
Triangulation	Seeks convergence, corroboration, correspondence of results from different methods
Complementarity	Seeks elaboration, enhancement, illustration, clarification of the results from one method with the results from the other method
Development	Seeks to use the results from one method to help develop or inform the other method, where development is broadly construed to include sampling and implementation, as well as measurement decisions
Initiation	Seeks the discovery of paradox and contradiction, new perspectives of frameworks, the recasting of questions or results from one method with questions or results from the other method
Expansion	Seeks to extend the breadth and range of inquiry by using different methods for different inquiry components

Source: Based on Greene, Caracelli, and Graham (1989).

- You can see in Table 14.4, that mixed research can help researchers to a lot of important things as they attempt to understand the world.

(3) Select the mixed method or mixed model research design

- We have already shown you, in this lecture, the basic mixed model designs and the basic mixed method designs.
- Remember that you can also build more unique and/or more complex designs than the ones we have shown as you plan a study that will help you to answer your research question(s).

(4) Collect the data

- Keep in mind the six major methods of data collection that we discussed in chapter 6: tests, questionnaires, interviews, focus groups, observation, and secondary or already existing data (such as personal and official documents, physical data, and archived research data).

(5) Analyze the data

- You can use the quantitative data analysis techniques (Chapters 15 and 16) and qualitative data analysis techniques (Chapter 17).
- You might want to use the technique of quantitizing (i.e., converting qualitative data into quantitative data).
- You might want to use the technique of qualitizing (i.e., converting quantitative data into qualitative data).
- For more information on data analysis in mixed research, I highly recommend the following:

Onwuegbuzie, A.J., & Teddlie, C. (2003). A framework for analyzing data in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 351-383). Thousand Oaks, CA: Sage.

(6) Validate the data

- Data validation is something that should be done throughout your research study because if your data are not trustworthy then your study is not trustworthy. In Chapter 8 we discussed validity strategies used in quantitative research (pp. 228-248) and validity strategies used in qualitative research (pp. 249-256).
- You should consider using quantitative and qualitative validity strategies in your study, and you should mix these in a way that best works for your mixed research study.

(7) Interpret the data

- Data interpretation begins as soon as you enter the field or collect the first datum (datum is the singular of data), and data interpretation continues throughout your research study.
- Remember that data interpretation and data validation go hand-in-hand; that is, you want to make sure that you continually use strategies that will provide valid data and help you to make defensible interpretations of your data.
- A couple of strategies to use during data interpretation are reflexivity (i.e., which involves self-awareness and critical self-reflection by the researcher on his or her potential biases and predispositions as these may affect the research process and conclusions), and negative-case sampling (i.e., attempting to locate and examine cases that disconfirm your expectations and tentative explanations).

(8) Write the research report.

- Writing the report also can be started during data collection rather than waiting until the end.
- Remember that mixing **MUST** take place somewhere in mixed research if it is to truly be mixed research, and your report should also reflect mixing; that is, as you discuss your results you must relate the quantitative and qualitative parts of your research study to make sense of the overall study and to capitalize on the strengths of mixed research.

In conclusion, mixed research is the newest research paradigm in educational research. It offers much promise, and we expect to see much more methodological work and discussion about mixed research in the future as more researchers and book authors become aware of this important approach to empirical research.