

Basic Characteristics of Mixed Methods Research

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QUESTIONS ADDRESSED IN THIS CHAPTER:

- How is mixed methods research defined?
- What is not mixed methods research?
- What are the six essential characteristics of mixed methods research?

UNDERSTANDING MIXED METHODS RESEARCH

The best way to begin a mixed methods project, I believe, is to have an understanding of the basic characteristics of mixed methods research. As a field of **methodology**, about 30 years old, there is today a general understanding as to the common characteristics of this approach to research. It has been described as a third methodology that sits between quantitative and qualitative research (Teddlie & Tashakkori, 2009). However, the perspectives about this methodology differ, such as it being viewed from more of a philosophical or theoretical approach (Greene, 2007), to a methodology orientation, focused on the phases of the research process (Teddlie & Tashakkori, 2009), to a transformative perspective to bring about change in communities or among groups (Mertens, 2009). These are all ways to look at mixed methods research; however, my particular stance is to view it as a method with a focus on the data collection, analysis, and interpretation in response to research questions. I was originally trained as a quantitative researcher in the early 1970s, expanded my interest to qualitative research in the 1980s, and began writing about mixed methods in the 1990s. My roots of training in quantitative and qualitative research have focused my attention on having rigorous methods of data collection and analysis. Consequently, as I define mixed methods, I will begin with my orientation toward it as a method, recognizing that alternative perspectives of it exist and are legitimate.

A DEFINITION OF MIXED METHODS RESEARCH

Given this perspective, I see **mixed methods research** as follows:

A methodology and method to research in the social, behavioral, and health sciences in which the investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates or combines the two, and then draws inferences (called “metainferences”) from the integration that provides insight beyond what can be learned from the quantitative or qualitative data.

A core assumption of this approach is that when an investigator combines both statistical trends (**quantitative data**) with stories and personal experiences (**qualitative data**), this collective strength provides a better understanding of the research problem than either types of data alone. Further, my stance is to give equal value to both qualitative and quantitative research and to not privilege one or the other in conducting a mixed methods study.

As seen in Table 1.1, there are both advantages and challenges of using mixed methods in a study. Individuals undertaking mixed methods research for the first time should be aware of these factors because they may be challenged by reviewers. Like any methodology used in research, there are both strengths and challenges in using mixed methods.

TABLE 1.1

The Advantages and Challenges of Conducting Mixed Methods Research

Advantages	Challenges
Presents the use of a relatively new methodology	Requires skills in both quantitative and qualitative research
Involves a complex and sophisticated methodology using both quantitative and qualitative data	Requires additional skills in mixed methods research
Affords the ability to draw insights beyond the quantitative and qualitative data analysis	Involves extensive time and resources to collect and analyze both qualitative and quantitative data
Opens the possibility of multiple publications (e.g., a quantitative paper, a qualitative paper, a mixed methods paper)	Places a demand on the researcher to often educate reviewers about the essential characteristics of mixed methods research

WHAT MIXED METHODS IS NOT

Given this definition, it is helpful to identify what mixed methods is not and to set aside misconceptions that researchers often hold about this approach:

1. Mixed methods is not simply the gathering of both quantitative and qualitative data. Although this form of research is helpful, it does not speak to the true insight that can be gained from integrating or combining the two databases.
2. Mixed methods research is not simply a label that a researcher can assign to their methodology. Mixed methods research has distinct approaches about designs and procedures for conducting research, integrating the data, and drawing conclusions or inferences, to mention just a few of its procedures. It is a stand-alone methodology in its own right.
3. Mixed methods should not be confused with mixed model research, a quantitative approach in which investigators conduct statistical analysis of fixed and random effects in a database.
4. Mixed methods is not simply an evaluation technique, such as formative and summative evaluation, although researchers can employ the collection, analysis, and integration of data within an evaluation. Later I will comment in detail on this use as one of the complex mixed methods designs (see Chapter 6).
5. Mixed methods is not simply the addition of qualitative data to a quantitative design. Later I will talk about intervention mixed methods designs in which investigators do add qualitative data into an experimental trial (see Chapter 6). However, this addition should not be seen as minimizing the equal importance of qualitative data or viewing the qualitative data as playing a supportive or secondary role.
6. Mixed methods is not content analysis (Krippendorff, 2004), in which a researcher collects qualitative data (typically interview data) and then analyzes them quantitatively (i.e., scores, categories). Mixed methods research clearly involves collecting *both* quantitative and qualitative data because each form of data offers different perspectives from participants.
7. Mixed methods is not simply the collection of multiple forms of qualitative data (e.g., interviews and observations) or the collection of multiple types of quantitative data (e.g., survey data, experimental data). It involves the collection, analysis, and integration of *both* quantitative and qualitative data. In this way, the value of the different approaches to research (e.g., the trends as well as the stories

and personal experiences) can contribute to understanding a research problem. When multiple forms of qualitative data (or multiple forms of quantitative data) are collected, the term is *multimethod* research, not mixed methods research.

ESSENTIAL CHARACTERISTICS OF MIXED METHODS RESEARCH

Here are six essential characteristics I have used over the years to further define mixed methods research:

- Collect and analyze quantitative and qualitative data in response to research questions
- Use rigorous qualitative and quantitative methods
- Incorporate procedures within a mixed methods design
- Integrate qualitative and quantitative data in the design
- Draw metainferences from this integration
- Include a worldview and a theory

In the remainder of this chapter, I will address each essential characteristic in greater detail.

Collect and Analyze Quantitative and Qualitative Data

I start with the assumption that the two types of data differ and take different but equally important roles. Quantitative data collection relies on the researcher making decisions about what data to collect (e.g., what variables to measure, what instruments to use). Alternatively, qualitative research is based on participant decisions where data collection involves asking open-ended, general questions and allowing individuals to formulate responses.

A researcher using *quantitative* methods decides what to study, poses specific questions or hypotheses, measures variables to facilitate the assessment of answers, uses statistical analysis to obtain information in order to answer the questions/hypotheses, and makes an interpretation of the results. This form of research is quite different from *qualitative* research, in which the investigator poses general questions and collects data in the form of text, audio recordings, or video recordings. A hallmark of qualitative research is that the researcher collects data by observing participants or directly asking them open-ended questions using tools such as interviews, focus group protocols, or questionnaires. After collecting qualitative data, the researcher conducts a thematic analysis and presents the findings in literary form, such as a story or narrative. Thus, both qualitative

and quantitative research follow the general process of research: identify a problem, determine research questions, collect data, analyze data, and interpret results. However, the means of carrying out each of these stages differs considerably between the two methods.

Elements of both quantitative and qualitative research are included in a mixed methods study. It becomes important, then, to realize that a mixed methods researcher needs to be skilled in both quantitative and qualitative approaches. Furthermore, to make the most of a mixed methods design, investigators need to understand the advantages and the disadvantages that accrue from both quantitative and qualitative research. See Table 1.2 for a brief comparison of the two approaches.

Use Rigorous Quantitative and Qualitative Methods

Although both quantitative and qualitative research flow into a mixed methods study, this does not mean that the scope of each approach will be reduced. Over the years, several authors have advanced criteria for what constitutes rigorous research from either a quantitative or qualitative perspective. We need to pay attention to these guidelines, whether they are the CONSORT quantitative randomized trial checklist (Schulz, Altman, & Moher, 2010) or the American Psychological Association standards, the Journal Article Reporting Standards (JARS)–Quant (Appelbaum et al., 2018), or the JARS–Qual (Levitt et al., 2018). In general, rigor occurs when the researcher incorporates elements such as the following:

- Type of research design used (e.g., experiment, ethnography)
- Permissions for gaining access to the site and adequate recruitment procedures
- Sampling approach (systematic vs. purposeful)
- Number of participants
- Types of data to be collected (e.g., text, audio and video recordings, test score, questionnaire responses)
- Instruments used to collect the data (e.g., surveys, observational checklists, open-ended interviews, focus group protocols)
- Organization and cleaning of the database as the first step in data analysis
- Later data analysis procedures, ranging from basic to more sophisticated approaches (e.g., descriptive to inferential, coding to theme development)
- Approaches to establish the validity and reliability of the data (e.g., quantitative internal validity, qualitative validation strategies)

TABLE 1.2

Advantages and Limitations of
Qualitative and Quantitative Research

Qualitative Research	
Advantages	Disadvantages
<p>Focuses on the views of participants, not the researcher</p> <p>Provides detailed perspectives of a few people</p> <p>Captures the voices of participants</p> <p>Allows participants' experiences to be understood in context</p> <p>Appeals to people's enjoyment of stories</p>	<p>Limits drawing generalizations</p> <p>Provides only soft data (not hard data, such as numbers)</p> <p>Studies few people</p> <p>Uses highly subjective interpretation</p> <p>Minimizes use of the researcher's expertise due to reliance on participants</p>
Quantitative Research	
Advantages	Disadvantages
<p>Relies on many researcher decisions</p> <p>Draws conclusions from large numbers of people</p> <p>Analyzes data efficiently</p> <p>Investigates relationships within the data</p> <p>Examines probable causes and effects</p> <p>Controls for bias</p> <p>Appeals to people's preference for numbers</p>	<p>Presents often dry, impersonal accounts</p> <p>Limits gathering the actual words of participants</p> <p>Provides limited understanding of the setting or context of participants</p> <p>Relies too much on the researcher's decisions</p>

Incorporate Procedures Within a Mixed Methods Design

Mixed methods research consists of not only collecting and analyzing quantitative and qualitative data but also linking or integrating the two databases in a specific design or set of procedures. Over the years, various authors have advanced many different types of designs with a diverse set of names. In our writings (Creswell & Plano Clark, 2018), we have taken the stance that this diversity creates confusion, especially for beginning researchers, and that it would be most helpful to have a smaller set of designs and allow researchers to adjust

or modify these basic or core designs to fit their particular study. Further, the designs, it should be noted, can be preplanned before a study begins or emerge as the study proceeds.

Here I will briefly introduce the two categories of designs and then in Chapters 5 and 6 go into the designs in more detail. First, we have **core designs in mixed methods research** that represent bringing together the quantitative and qualitative data. The three core designs are popular in mixed methods research, and one or more of them are included in all mixed methods studies.

The three core mixed methods designs are as follows:

- In a **convergent design**, the researcher compares results from the quantitative and qualitative data analysis. The researcher collects both quantitative and qualitative data, analyzes both data sets, and then *compares* the results by *merging* or placing the two databases side by side to see how the results confirm a common understanding or present a divergence of findings. This is the intent of this design. Sometimes this design involves changing or transforming—**data transformation**—the qualitative data into scores or measures and combining this transformed information with the quantitative database. In this case, rather than a comparison of results, the researcher seeks to combine the results.
- In an **explanatory sequential design**, the researcher connects the quantitative and qualitative data by having one database build on the other. The procedure is to first collect quantitative data and then to follow-up with qualitative data to *explain* from personal experiences the quantitative results in more detail. Explanations may help to understand unusual or surprising quantitative responses or to understand the quantitative statistical results in more detail.
- In an **exploratory sequential design**, the researcher plans to develop quantitative measures or assessments that capture the culture and understandings of the participants being studied. The procedure involves building this understanding by first collecting qualitative data, designing or adjusting the measures or assessments to fit the culture or population under study based on the initial qualitative data, and then administering the culturally sensitive quantitative measure or assessment. This procedure can be used, for example, to develop a culturally sensitive survey instrument or experimental or intervention activities.

After using these core designs for several years, I (and my colleague, Plano Clark, and others) found that these core designs were being used in processes or procedures that went beyond the designs of simply combining the qualitative and quantitative data. We found that the core designs were being used by

researchers in more complicated procedures or processes. For example, evaluation projects have multiple phases in which both quantitative and qualitative data can be collected at different phases. In experiments (or interventions, which are hereafter called experiments), the combination of both qualitative data and the quantitative trial involved adding core designs at different stages of the study. Consequently, we began to consider additional designs than the three core designs and have called them “advanced” designs (Plano Clark & Ivankova, 2016), “scaffold” designs (Fetters, 2020), or “complex” designs (Creswell & Plano Clark, 2018). In this book, I will use the term **complex mixed methods research designs** because I feel that it best captures the idea that core designs are embedded within a complex framework or process. Here are four examples of complex designs that include one or more core designs:

- **Mixed methods experimental (or intervention) designs** are those in which the researchers add one or more core designs into an experiment. This is accomplished by combining qualitative data with the quantitative experiment or trial. The qualitative data can be added in before the trial, during the trial, after the trial, or some combination of these times during a trial. Adding data in this case consists of *embedding* the qualitative data within a quantitative experimental trial.
- **Mixed methods participatory action research designs** are those in which the researcher adds one or more core designs into an overall social justice or participatory action research process. The quantitative and qualitative data (and their combination) flow into the framework at different points, but the participatory framework becomes a constant focus of the study aimed at improving the lives of individuals or communities in our society today (e.g., a feminist social justice design). Databases added in this type of design involve *threading* the core designs into the social justice or participatory framework throughout the study.
- **Mixed methods multiple case study designs** are designs that include one or more of the core designs in a study with the intent to develop a case or multiple cases, document or provide evidence for a case or cases, and then, in multiple case studies, conduct a cross-case analysis of the cases. Thus, cases can be deductively tested or inductively derived. The core designs contribute to *identifying or testing* cases.
- **Mixed methods evaluation designs** are designs that include one or more core designs within the stages or phases of an evaluation process. Evaluations have known stages or phases that researchers use, such as a needs assessment, the development of measures for assessing a program, the design of a program, and follow-up analyses to determine

if the program works. At one or more of these stages or phases, the researcher collects and combines quantitative and qualitative data. Thus, the core designs are *embedded* into the evaluation process.

Integrate Qualitative and Quantitative Data

Over the years, the topic of how to integrate the quantitative and qualitative data in core and complex designs has baffled researchers. Undoubtedly at the heart of this controversy lies an awkwardness of combining or bringing together numeric data (i.e., close-ended) with text data (i.e., open-ended). Prior to the advent of mixed methods, the databases were mostly kept separate in studies. However, mixed methods researchers have seen the additional insight that results from the integration of the two databases.

Integration is the process in which the researcher brings the quantitative and qualitative databases together. It represents the centerpiece of good mixed methods research and enables a researcher to draw further insight from data beyond the qualitative findings and the quantitative results. This integration process differs depending on the type of mixed methods design used in a study, and thus it varies in procedures. I think about integration in terms of its intent and the process for assessing it. First look at the **integration intent** (or justification) for collecting and analyzing both forms of data within a design. For a convergent design, for example, the reason lies in comparing the two databases so that a comparison of them can be made. In Chapter 8, I will discuss the *integrative* intent for the major core and complex designs. Second, consider the **integration procedures**. The procedures can take several forms: merging, explaining, building, and embedding, depending on the type of design. Also, these procedures are best conducted using a visual display, a table to co-present the quantitative and qualitative data, called a *joint display*, which will be further detailed in Chapter 8. In this sense, integration represents *mixed methods data analysis* and the way to analyze the combination, the “mixing” or the integration of the databases.

Draw Metainferences From Integration

In mixed methods research, the investigator collects and analyzes both qualitative and quantitative data, identifies a design, and then integrates the databases within the design. One more step is required: The researcher needs to closely inspect the results of the integration and draw inferences (or conclusions, interpretations, or insight) from the integration. This is known as drawing metainferences (Fetters, 2020). It is called “meta” inferences because in a mixed methods study, the researcher draws inferences not only from the quantitative results and the qualitative findings, but also from the integration analysis. Metainferences thus provide a broader integration beyond the qualitative and quantitative databases. These metainferences can be identified in a separate column in a joint display table or discussed in the results section

in a mixed methods article. Basically, they consist of concluding information about the relationship between the two types of data and suggesting how these relationships relate to existing literature or to known theories or conceptual frameworks. Chapter 8 will go into more details about drawing metainferences in mixed methods research.

Include a Worldview and a Theory

The final characteristic I would add would be to consider incorporating a worldview and a theory in a mixed methods study (see additional thoughts in Chapter 3). Both of these elements hover at the abstract level above the procedures. The first, the worldview, is the perspective that the researcher brings to a study, while a theory (or conceptual framework) represents a larger explanation from the literature typically based on the thinking of other researchers.

Worldviews go by different names in the literature: Sometimes they are called “paradigms” or “philosophical assumptions.” They are the beliefs and values (Guba, 1990) that a researcher brings to a study that informs the types of problems studied, the methods used to study the problem, and the important significant results. Examples of these beliefs would be whether a researcher sees an important objectivity that explains what participants say (called **ontology**), describes how we know something exists (called **epistemology**), places importance on the researchers’ values and bias (called **axiology**), the types of procedures used in a study (called **methodology**), or how the study needs to be written (called **retorical assumptions**) (Creswell & Creswell, 2018). Being specific about a worldview is important because we all bring assumptions to our research, and it lets readers know the stance of the investigator. In mixed methods research, a popular worldview is **pragmatism**. This is an American philosophy focusing on the importance of the research question, collecting multiple forms of data to address the question, and applying the findings in a “real-world” practical way.

Theories (or conceptual frameworks) are also important to use in mixed methods research. They are sometimes called “theoretical rationales” in studies. They help a researcher predict or explain findings in a study. A theory in quantitative research is an explanation as to what the researcher expects to find. This theory can be used to explain, predict, generalize, and inform the research questions and hypotheses in a study. A theory in qualitative research can also be an explanation or a lens that informs the phases of the research process. In social, behavioral, and health science research, the theory may be one drawn from the social sciences, such as a theory of diffusion, leadership, or behavioral change. One finds these theories in the literature, and the researcher locates them by closely reading journal articles and research studies that include theories. They typically inform the quantitative side of research and help in determining what questions to ask. In qualitative research, they may be advanced at the beginning of a study (e.g., an ethnographic theory of acculturation), or

they may emerge through data collection (e.g., in grounded theory research). It is helpful in mixed methods studies to make these theories explicit, to describe them in some detail, to identify the author(s) of the theory, and to suggest how the theory informs a particular phase in the mixed methods study (e.g., the quantitative component of data collection). Often this is presented in a study as a diagram or figure.

RECOMMENDATIONS FROM THIS CHAPTER

I would recommend that researchers planning or conducting a mixed methods study be able to

- define mixed methods research in a study,
- recognize when their proposed study does not meet the definition of mixed methods research, and
- evaluate their idea for a mixed methods project by asking themselves the following questions about key characteristics:
 - Am I collecting and analyzing quantitative and qualitative data in response to research questions?
 - Am I using rigorous qualitative and quantitative methods?
 - Have I identified a mixed methods design for my procedures?
 - Am I integrating the quantitative and qualitative data within the design?
 - Am I drawing metainferences from my integration analysis?
 - Have I incorporated a theory or conceptual framework? Have I reflected on my philosophical assumptions that I bring to the research study?

ADDITIONAL READINGS

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Los Angeles, CA: SAGE.

Fetters, M. D. (2020). *The mixed methods research workbook: Activities for designing, implementing, and publishing projects*. Los Angeles, CA: SAGE.

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112–133.

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks, CA: SAGE.

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