

Summary

Contents

Subject index

< [BACK TO TABLE OF CONTENTS](#)

Research Questions in Mixed Methods Research

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In: [SAGE Handbook of Mixed Methods in Social & Behavioral Research](#)

Chapter DOI: <https://dx.doi.org/10.4135/9781506335193.n12>

Subject: [Anthropology](#), [Business and Management](#), [Criminology and Criminal Justice](#), [Counseling and Psychotherapy](#), [Education](#), [Geography](#), [Health](#), [History](#), [Marketing](#), [Nursing](#), [Political Science and International Relations](#), [Psychology](#), [Social Policy and Public Policy](#), [Social Work](#), [Sociology](#).

Keywords: [communities of practice](#); [emotion](#); [teaching](#)

 [Show page numbers](#)

Research Questions in Mixed Methods Research

Vicki L. Plano Clark and Manijeh Badiee

Objectives



After completing this chapter, you should be able to

Tools

On this page

articulate your definition of research questions within mixed methods research;
distinguish between two prominent perspectives about how a mixed methods study is designed in response to its research questions;
identify the major influences to which researchers attribute the origins of their mixed methods research questions;
describe four dimensions useful for writing mixed research questions and give examples of the different options for each;
apply criteria for evaluating research questions in mixed methods studies; and
write good research questions for your mixed methods study.

Research questions play a central role in the process of conducting research, particularly the decision to use a mixed methods approach. The mixed methods literature is uniform in its position that mixed methods research is appropriate when a study's purpose and research questions warrant a combination of quantitative and qualitative approaches. Although much has been written about the link between purposes and mixed methods, comparatively little work has explicitly addressed research questions in mixed methods research. Because of their importance, however, scholars need to critically consider the decisions that shape and are shaped by research questions within mixed methods research. In addition, researchers need practical guidance about how to conceptualize and write research questions when conducting mixed methods studies.

The intent of this chapter, therefore, is to advance a framework for research questions in mixed methods research that builds on methodological discussions as well as researchers' practice for conceptualizing and stating their research questions. We begin by briefly defining what we mean by research questions and reviewing their importance. Next, we discuss two prominent perspectives about the role of research questions in designing mixed methods studies. From there, we advance a model that explains the origins of research questions within the dynamic mixed methods research process as it is experienced in practice. From this model, we describe how mixed methods researchers write their research questions. We delineate the dimensions of these questions and provide examples from practice to illustrate the range of approaches that researchers use across each dimension. We conclude with recommendations for researchers formulating research questions that for and fit within a mixed methods approach.



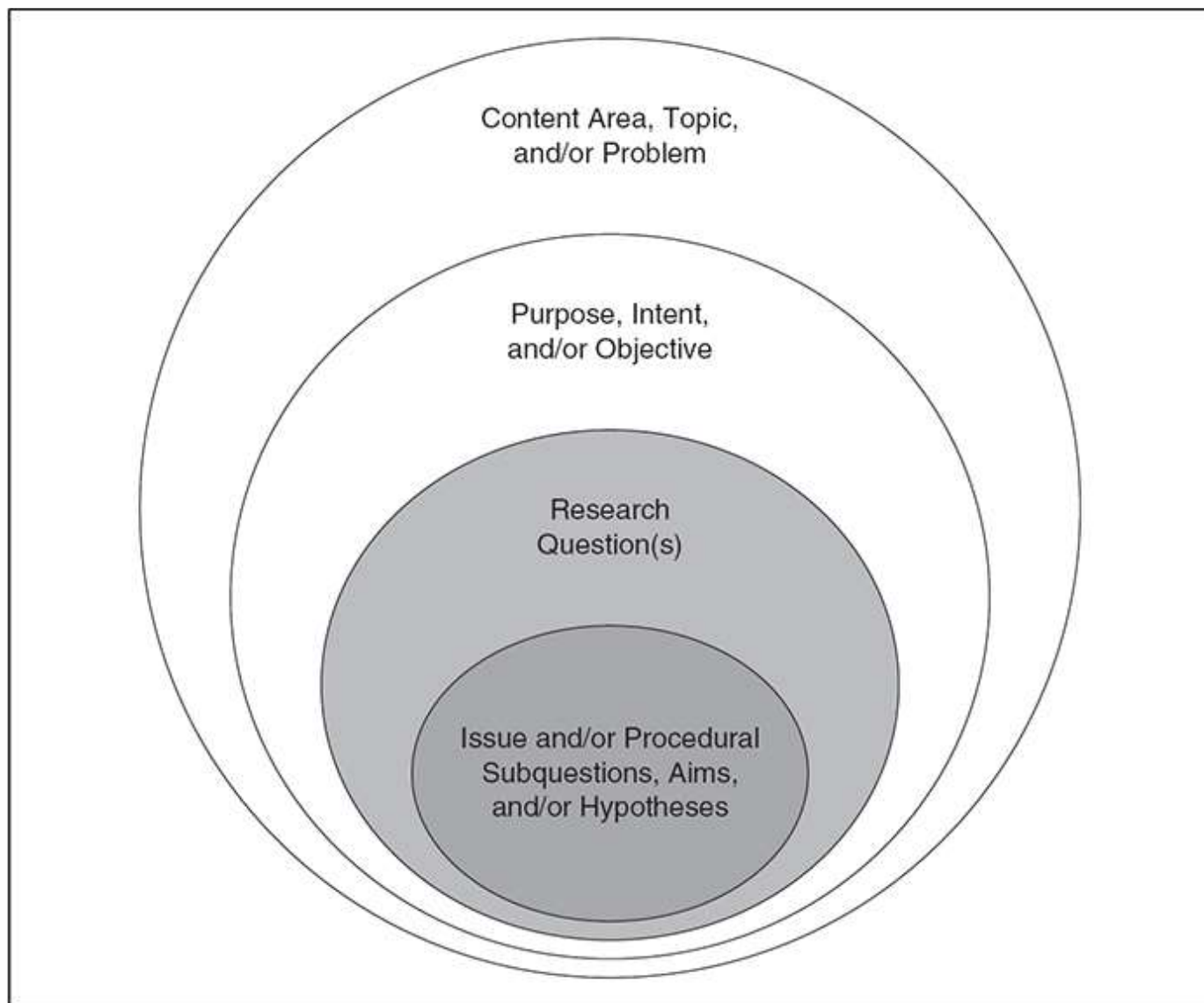
Defining Research Questions

At its most basic level, researchers conduct research to answer questions, and therefore, research questions are of central importance for all approaches to research. Despite their importance, research questions are not easily defined, and scholars do not always agree as to what constitutes a research question. We begin with a brief discussion of how research questions differ from other aspects of research studies and why they are important. These two concepts convey our definition of research questions and serve to clarify the scope of this chapter.

Three key elements define the focus for any study: the content area, the purpose, and the research questions. As depicted in [Figure 12.1](#), these elements are viewed in a hierarchy that spans from the general and broad (the content area) to the specific and narrow (the research questions) (Creswell, 2008; Punch, 2005; Ridenour & Newman, 2008). The content area, also referred to as the topic or research problem, represents the broad substantive subject matter of a study. For example, a study's content area might be online interactions, diabetes prevention, management styles, or any other topics that pique the interest of researchers. Due to the broad nature of content areas, one can imagine a wide range of possible purposes and use of methods within any particular area.

Figure 12.1 Focusing a Study From the Topic to Research Questions



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A study's purpose falls within the content area. The purpose describes the researcher's primary intent, objectives, and goals for the study. The purpose provides a guide to the researcher's thinking about the study (Punch, 2005) and sets the overall direction for the research (Creswell, 2008). Many research purposes are possible, as illustrated by Newman, Ridenour, Newman, and DeMarco (2003), who advanced a typology of more than 40 distinct purposes and demonstrated their application within one content area. They noted that certain methods are best suited for or traditionally linked to studies with certain purposes. The general purpose for a mixed methods study indicates the need for and use of both quantitative and qualitative methods (Teddlie & Tashakkori, 2009). For example, a researcher's complementary purpose may be to develop a complete understanding of



others online and quantitatively assessing the trends of different interaction types. As such, the researcher moves from the purpose to research questions.

Research questions are derived from and extend a study's purpose (Ridenour & Newman, 2008). Compared with the purpose, research questions are more specific and represent the actual questions that the researcher is working to answer (Creswell, 2008). Research questions set boundaries to a research project, clarify its specific directions, and keep a study from becoming too large (Punch, 2005; Teddlie & Tashakkori, 2009). Research questions also are important in the reporting of research. As literary devices, they provide a framework for organizing a report and help the author link the study's purpose to the study's methods and results (Creswell, 2008).

Researchers typically state multiple research questions and often subquestions that further narrow larger questions. These questions and subquestions are often content or issue focused. For example, a researcher may ask: How do user characteristics relate to different types of online interactions? Researchers may also pose procedural subquestions that emphasize the procedures to be used to address a more general question (Creswell, 2008; Randolph, 2008; Stake, 1995). That is, the same researcher may pose procedural questions such as these: What statements describe users' online interactions? What themes emerge from the statements? What is the prevalence of the themes? How does the prevalence of themes relate to users' characteristics? Procedural questions are more common in research studies using emergent designs where the content results are not predictable at the start of the study.

In addition to using different question types, researchers also use different forms for writing their research questions. Researchers may state their research questions explicitly as questions, that is, as interrogative statements complete with question mark: for example, What online interactions occur in distance courses? Researchers also state research questions in the form of study aims. Aims are declarative sentences that express what a researcher means to accomplish: for example, This study aims to describe the online interactions that occur in distance courses. Finally, researchers may state research questions in the form of hypotheses. Hypotheses are statements that predict the outcome of research

able to make a prediction (Johnson & Christensen, 2008). For example, a researcher might offer this hypothesis: Successful distance courses include a richer set of interactions among students and the instructor than those rated as unsuccessful.

In this chapter, we define research questions as the specific questions that the researcher is attempting to answer when conducting a mixed methods study. As indicated by the shaded regions of [Figure 12.1](#), our definition includes both issue and procedural questions and subquestions. Although we primarily use the term *research question*, our use of this term includes statements made as questions, aims, and hypotheses.

The Role of Research Questions for Designing Mixed Methods Research Studies

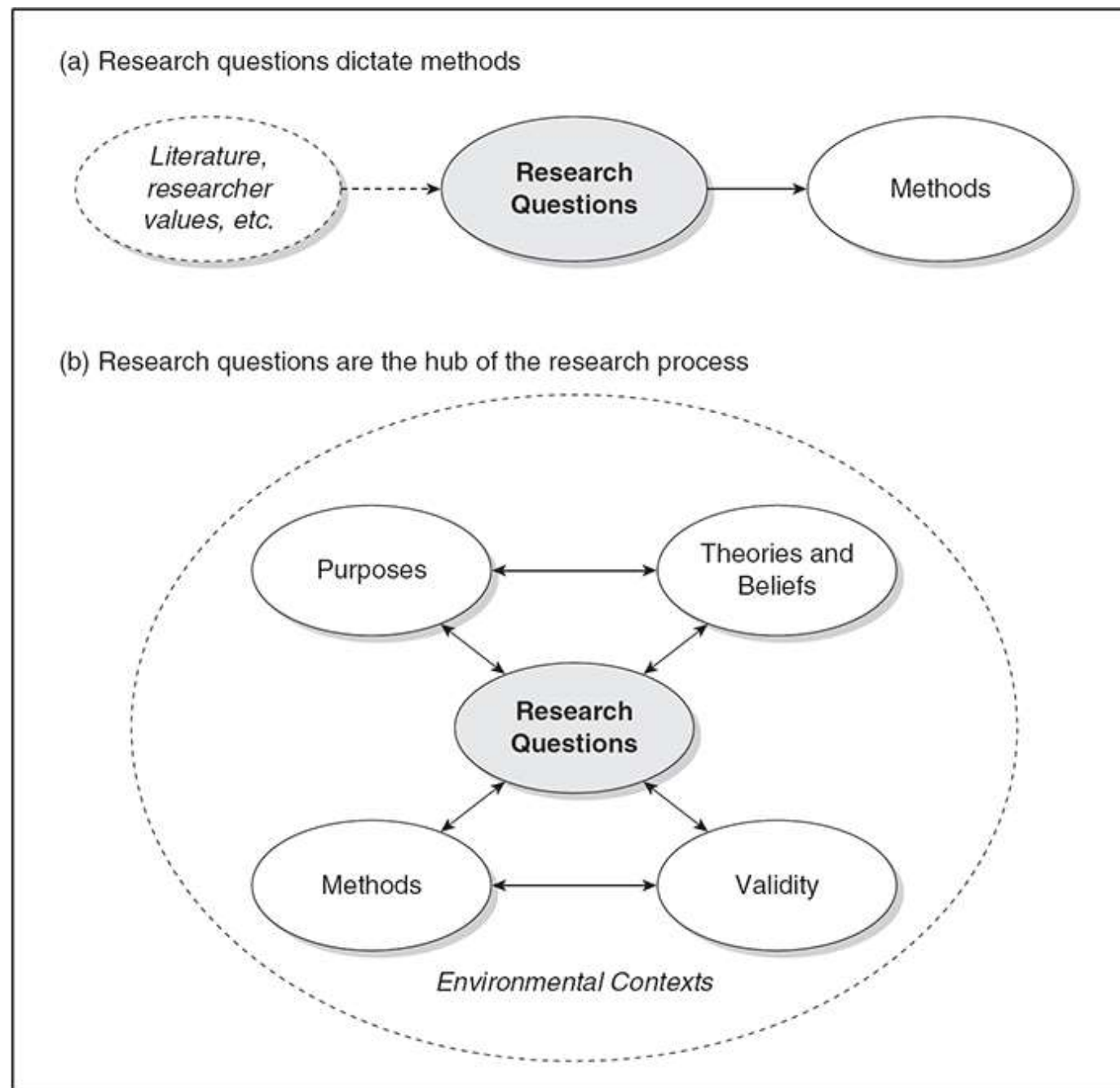
Because research questions provide the narrow focus for a study, they provide a direct link from the study's purpose to its design and methods. The role of research questions within the process of designing mixed methods research has received extensive attention within the literature. In these writings, scholars have advanced two models: Research questions dictate methods and research questions are the hub of the research process. While commonalities exist between these models, there are also differences in their emphases and the relationships contained within them, as represented in [Figure 12.2](#).

Research Questions Dictate Methods

Several scholars have discussed research questions as the driving force for mixed methods research (e.g., Greene, 2007; Johnson & Onwuegbuzie, 2004; Onwuegbuzie & Leech, 2006; Ridenour & Newman, 2008; Teddlie & Tashakkori, 2009). They argue that researchers should start with research questions, and all methods decisions should follow directly from these questions. Writers advocating this perspective invoke strong language to convey the dominating role of the research question. Greene (2007) noted that “methodology is ever servant of purpose [and questions], never the master” (p. 97). Similarly, Tashakkori and

Teddlie (1998) described this perspective as the “dictatorship of the research question” (p. 20). We depict a simplified view of this model in [Figure 12.2a](#).

Figure 12.2 Two Models of How Mixed Methods Research Studies Are Designed in Response to Research Questions



SOURCE: Adapted from Maxwell & Loomis (2003, p. 246) with permission of Sage Publications.

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From this dictatorship model, a researcher's choice of methods becomes analogous to

toolbox to answer the stated questions. For example, Onwuegbuzie and Leech (2006) discuss how research questions drive the choice of a specific mixed methods design, sampling procedures, and data analysis techniques. In addition, the use of mixed methods becomes appropriate if, and only if, it is called for by the research questions, such as when a researcher has both exploratory and confirmatory questions (Bryman, 2006b; Teddlie & Tashakkori, 2009). This pragmatic perspective relegates considerations such as the worldviews commonly associated with certain methods and a researcher's preference for certain methods to positions of secondary importance (Tashakkori & Teddlie, 1998), as portrayed by the dotted lines in [Figure 12.2a](#).

There are many advantages to using a model in which the research questions dictate the methods for mixed methods research. This model fits a pragmatic perspective well where designs and methods are selected based on “what works” for answering the stated research questions (see Biesta, 2010; Greene & Hall, 2010 [both in this volume] for a more in-depth discussion of pragmatism). By de-emphasizing the link between methods and paradigms and placing the emphasis on research questions, this model also helps to defuse debates about whether paradigms can be mixed. In addition, this model fits well with a traditional and largely linear process of research that encourages researchers to minimize contextual influences on designing a research study, such as personal preferences for using certain methods. Writers discussing this model do acknowledge that the research process is more complex than a simple dictatorship. They note that questions are guided by personal value systems; may emerge or change during a study; and interact with purpose, theory, and methods (Greene, 2007; Onwuegbuzie & Leech, 2006; Tashakkori & Teddlie, 1998). The emphasis on a pragmatic, linear model of the process of research, however, provides little guidance for researchers who are using different worldviews (e.g., see discussions of the transformative paradigm, Mertens, Bledsoe, Sullivan, & Wilson, 2010; critical realism, Maxwell & Mittapalli, 2010 [both in this volume]) or who are navigating the dynamic process by which research questions develop, are refined, or emerge within the conduct of some mixed methods studies.



Research Questions Are the Hub of the Research Process

Maxwell and Loomis's (2003) interactive model is an alternative model of the role of research questions within mixed methods design. This systemic model, pictured in [Figure 12.2b](#), directly relates a study's research questions to four study components—its purposes, guiding theories and beliefs, methods, and validity considerations—and emphasizes the interrelationships among these components. In this model, research questions also play a central role, but this model views them as interacting and integrated with other components of the research process instead of in a linear process. Research questions are considered central to this model because they inform and are informed by the other components, not because they are a starting point. That is, they are the hub of the interactive model. When Maxwell and Loomis (2003) apply this model to mixed methods studies, the research questions include both questions of variance (e.g., how true, present, much, or correlated?) that are associated with quantitative data and questions of process (e.g., how and why?) that are associated with qualitative data. The combination of variance and process questions informs and is responsive to the purposes, conceptual frameworks, methods, and validity considerations within the design of the study.

Maxwell and Loomis (2003) offer several advantages of this dynamic model for mixed methods research. They argue that individuals can develop a more nuanced understanding of the integrated nature of a mixed methods study by examining each of the five components because the integration of the quantitative and qualitative aspects may occur across components. In addition, they argue that this model provides a more responsive tool for considering how to design a mixed methods study because it better considers the context and process by which a particular mixed methods study unfolds in practice, instead of overemphasizing preset design typologies. Although the focus of their discussion is on the five components, Maxwell and Loomis also present a model of the contextual factors that influence these components in mixed methods design, which is symbolized here by the dotted line in [Figure 12.2b](#). They note that funding goals and research paradigm are contexts that directly influence one's research questions, and they provide numerous other contexts that indirectly influence the research questions through the beliefs and theories, purposes, methods, and validity components salient to the study.



Both models provide useful frameworks for designing a mixed methods study in response to

qualitative approaches. In both cases, the writings focus on the implications of the research questions on other decisions, such as methods, as opposed to focusing on the development of the research questions themselves. Therefore, these models prove most useful for demonstrating how research questions link to the rest of the mixed methods research process, but they do not provide a specific framework for considering how researchers arrive at their mixed research questions in practice, and they do not suggest guidelines for how these questions are composed.

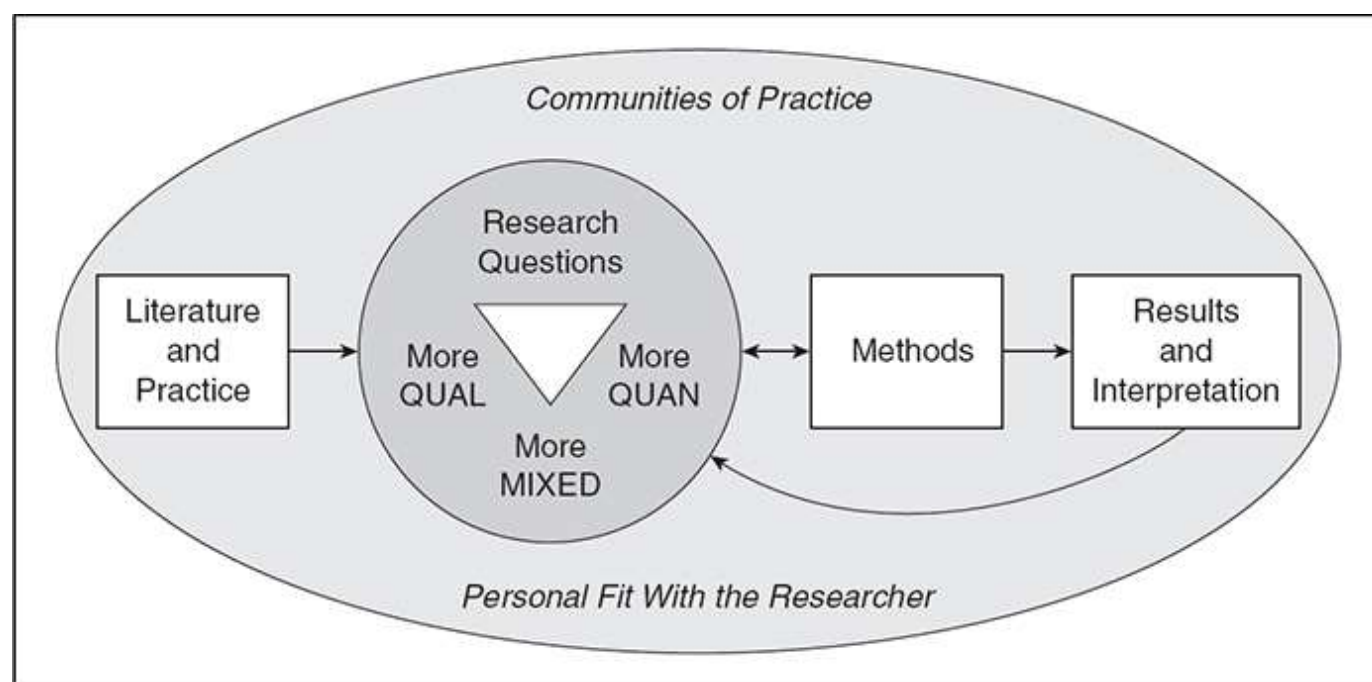
A Framework for Describing the Origins of Research Questions in Mixed Methods Research

To examine the origins of research questions within mixed methods research, we read relevant literature and examined practice-based sources for insight into how researchers compose research questions in practice as they plan, conduct, and report mixed methods studies. We studied the research questions reported within (a) the abstracts from 226 U.S. federally funded health-related proposals that self-identified as using mixed methods research within the CRISP Database (crisp.cit.nih.gov/)¹ (Plano Clark, in press), (b) 25 dissertations that self-identified as using mixed methods within the Dissertation Abstracts database, and (c) numerous manuscripts that reported the results from mixed methods studies. In addition, our sources included studies that reported the results of interviews with mixed methods researchers (Bryman, 2006b, 2007; O'Cathain, Murphy, & Nicholl, 2007; Plano Clark, 2005).

We offer the model in [Figure 12.3](#), which emphasizes the development, refinement, and emergence of research questions within mixed methods studies and delineates the dimensions of these questions. The rectangular boxes represent the general research process. That is, this model considers how research questions are generated at three stages of research: (1) at the start of the study from the literature and practice, (2) in conjunction with the decisions about and implementation of the methods, and (3) in response to specific results and interpretations that emerge from the study. It also acknowledges the role of the

personal fit with the researcher. We do not offer this model as a replacement for the other models. Instead, we argue that this model emphasizes different aspects of the research process and therefore seeks to further our thinking about research questions within mixed methods studies. The role of each of these categories in the generation of mixed research questions is considered in this section. The next section focuses on the dimensions for writing questions generated within mixed methods studies (the central circle in [Figure 12.3](#)).

Figure 12.3 A Model of the Origin of Research Questions Within the Process of Mixed Methods Research



NOTE: QUAN = quantitative; QUAL = qualitative.

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Research Questions Are Suggested by Problems Found in the Disciplinary Literature and Practice

The most traditional approach to generating research questions is for the researcher to develop them in response to problems as identified within the literature and practice. This development process includes identifying a topic, reviewing literature, defining terms, and stating a general purpose or objective for the research (Ridenour & Newman, 2008).



such as a gap in the literature or voices of individuals who have not been heard or who have been silenced, or practice that needs to be improved (Creswell, 2008). As such, research questions in mixed methods are about what is *not* known about a phenomenon (Teddle & Tashakkori, 2009). Deficiencies in the literature that point to a need for both quantitative and qualitative approaches call for a researcher to develop a mixed methods purpose and research questions (Creswell & Plano Clark, 2007). Examples of researchers' considerations about relevant literature and practices when formulating research questions include the following:

- What is known about the topic from prior qualitative, quantitative, and mixed methods research?
- What is not known? What knowledge is needed?
- Is one type of question and method inadequate for addressing the needed knowledge?
- What theories or conceptual frameworks inform thinking about the topic? Do aspects of the theory need to be generated and tested?

Research questions in mixed methods research also require two types of information (e.g., narrative and numerical) to be answered (Teddle & Tashakkori, 2009). For example, after an extensive discussion of the literature, Feldon and Kafai (2008) noted inconsistencies in prior quantitative and qualitative research conducted on the personal meanings and social functions of avatars (graphic self-representations within online environments) and argued that there is a need to develop "contextualized understanding of broader trends" (p. 580). From this literature-derived need, they stated a combination of questions about quantitative trends in online user activity related to the avatars and about qualitative descriptions of the meaning of the user activities. As another example, Bernardi, Keim, and von der Lippe (2007) concluded from the literature that there are two specific problems related to the study of social influences on fertility. They linked these problems to the study's aims by noting, "We regard a combination of qualitative and quantitative approaches as best suited to tackle the two problems" (p. 24). The identification of gaps in understanding as a source of research questions is also common practice within mixed methods proposals. Bradley (2007) noted in her proposal that "the lack of evidence about what accounts for hospital-level variation in risk-adjusted mortality rates is a critical gap in our current knowledge about how to improve outcomes" (Paragraph 1). To address this gap, she proposed two aims, one to generate



hypotheses about hospital-level practices and a second to test these hypotheses in terms of specific mortality rate outcomes.

Research Questions Are Influenced by Communities of Practice

With the exception of Maxwell and Loomis (2003), little of the mixed methods literature has examined the influence of social factors on the research process in general, and the generation of research questions in particular. Recent discussions by Morgan (2007) and Denscombe (2008), however, highlight the importance of disciplines and research groups as influential contexts for the mixed methods research process. Both discussions draw heavily on Kuhn's (1970) work and emphasize a definition of paradigm that is based on research practice and research communities. Morgan (2007) defines a paradigm as a community of researchers who "share a consensus about which questions are most meaningful" (p. 53). Denscombe (2008) links this idea to "communities of practice" and argues that evidence from practice supports the conclusion that social factors significantly affect researchers' methodological decisions when conducting mixed methods research. Maxwell and Loomis (2003) also described social factors as part of the environment in which all aspects of research design take place. Therefore, while this discussion focuses on the influence of communities of practice on the origin of research questions, we acknowledge that it plays a contextual role for the entire research process in [Figure 12.3](#).

There are many ways that communities of practice influence the generation of research questions within mixed methods studies. Denscombe (2008) describes the power of these influences by stating, "Researchers who have regards to careers and research funding will find it hard, probably impossible, to ignore such an influence to conform to group norms" (p. 279). That is, when researchers develop research questions for a study, they often consider (consciously or subconsciously) issues such as these:

- Are mixed research questions of interest to or preferred by the larger discipline?
- Will my doctoral committee approve or require mixed questions?
- Do mixed questions need to be asked to satisfy different audiences?
- What questions will be publishable in disciplinary journals?
- How can my questions match the priorities of funders?



Due to the ubiquitous nature of social influences and the general practice to forgo discussion of these influences within published research reports, their role within individual studies is often hidden and unexamined. Interviews with mixed methods researchers, however, highlight the importance of communities-of-practice influences. Bryman (2007) uncovered significant influences that he attributed to the “predispositions and preferences of... disciplines and funding agencies” (p. 20). Plano Clark (2005) also noted examples of researchers describing the nature of these influences, such as the perception that individuals are influenced to choose their questions and use of mixed methods based on perceived fads within disciplines. Although we found no published report in which a researcher claimed to use mixed questions in response to a current fad, recent trends in the growing use of mixed methods give credence to this claim. For example, when searching the Dissertation Abstracts database, we found that the number of dissertations that self-report as mixed methods has increased exponentially from 23 to 718 between the years of 1997 and 2007. Clearly, there is growing interest in asking questions associated with this approach.

Researchers interviewed by Plano Clark (2005) identified additional types of influences from research communities. Counseling psychology researchers described being more apt to pose mixed research questions because “counseling psychologists were now more interested in process questions in addition to outcome-based questions” (p. 116). Researchers from the discipline of physics education research reported the need to pose two types of questions (quantitative and qualitative) to satisfy the different expectations of their researcher and practitioner audiences. Evidence for the influence of community norms on research questions can also be found within published studies. This influence ranges from the presentation style used to the types of questions deemed acceptable. Our examination of different venues for reporting mixed methods research found that dissertation authors usually stated their research questions as questions, whereas investigators usually stated specific aims instead of questions in their proposal abstracts. Journal article authors varied in the rhetorical style in their mixed methods reports, including the use of questions, hypotheses, and aims.



The influence of funding agencies is particularly important in mixed methods research

research questions within proposals. Researchers may specifically adapt their questions to meet funding guidelines calling for certain types of questions or methods. For example, in one successful funding proposal, the investigator noted the tie between the agency's goals and her proposed study: "Further, in using a mixed methods approach to accomplish this task, this research will address a second goal by the [funding agency]: to use a variety of qualitative and quantitative methods as a vehicle for collecting data" (Owen-Smith, 2007, Paragraph 1). As another example of the magnitude of funders' influence, Miall and March (2005) changed their research questions and subsequent methods to satisfy their funders' view that qualitative questions should be studied before quantitative questions. They noted, "We had intended to draw an interview sample from the larger telephone survey. In reviewing our research proposal, the funding agency mandated a qualitative study followed by a survey" (p. 407).

Research Questions Fit with a Researcher's Beliefs and Prior Experiences

The choice to develop mixed research questions also reflects personal aspects of the researcher. Anyone who has worked with graduate students has probably heard students claim that they consider only certain types of research questions because they are "quantitative researchers" or "qualitative researchers." As much as methodologists would like to discourage this methods-first thinking, the reality is that most of us have also heard similar statements from very experienced and successful researchers, who say they are interested only in cause-and-effect questions that call for quantitative experimental methods or in process questions that call for the use of grounded theory methods. Researchers generate questions that are consistent with their personal worldview and mental models for conducting research. Researchers' choices and statements of mixed research questions are also shaped by their personal goals, value systems, preferred styles of research, and expertise (Creswell & Plano Clark, 2007; Maxwell & Loomis, 2003; Tashakkori & Teddlie, 1998). That is, researchers may want to actively examine how their personal beliefs are influencing a mixed methods study's research questions, by asking questions such as the following:



• Are questions associated with mixed methods research consistent with my worldview?

Tools

On this page

- Is my prior training helping me to be open to mixed research questions?
- Do my personal goals call for mixed research questions?
- Are my prior experiences encouraging me to consider mixed research questions?

Certain worldviews and standpoints are considered conducive for researchers to pose mixed research questions. These include pragmatic (Johnson & Onwuegbuzie, 2004), dialectical (Greene & Hall, 2010), transformative (Mertens et al., 2010), and feminist (Hesse-Biber, 2010 [this volume]) perspectives. Researchers may identify the perspective that shapes their questions in their reports. Edwards and Lopez (2006) stated that their study of the development of a critical consciousness “was conceptualized from a pragmatic theoretical paradigm” (p. 281). Hodgkin (2008) discussed how she conceptualized her study of women's social capital from the transformative research paradigm and feminist perspectives, which led her to pose mixed methods research questions “to highlight issues of need (quantitative data) and to give voice to these issues (qualitative data)” (p. 299).

As with the community-of-practice context, researchers seldom discuss how personal considerations influenced their research questions in their reports beyond possibly identifying the worldview framing the study. In interviews, however, mixed methods researchers readily discussed the importance of their personal history and prior methods training in influencing the development of mixed research questions (Plano Clark, 2005). Likewise, in her mixed methods book, Greene (2007) describes how her personal “mixed methods story” (p. 60) developed through formal schooling, tenure expectations, personal dissatisfaction with mono-method approaches, professional development, and a belief in the value of diverse perspectives. She encourages other researchers to reflect on how their personal history influences the research that they conduct, including the questions they ask.

Some researchers also explicitly tie their questions and methods to personal goals. For example, the U.S. National Institutes of Health offer “K” awards where investigators propose training activities to develop expertise with particular methods, such as mixed methods, including a research study that will provide them the opportunity to apply and practice the new skill. An example of the personal aspect from one of many such successful proposals is, “The applicant is proposing funding... to conduct a program of training and research that develop skills in mixed-methods research strategies.... The proposed research projects will

methods strategies” (Stirman, 2007, Paragraph 1). Researchers also pose mixed questions based on their personal interests and experiences. For example, Green (2003) describes how her experiences as the mother of a daughter with disabilities led her to pose questions that mattered to her, and she reported her mixed methods study to answer them.

Research Questions Shape and Are Shaped by Methods

As the models in [Figure 12.2](#) illustrate, researchers select methods that are best suited for addressing their research questions. In addition to questions informing researchers' methods choices, issues particular to the methods element of the research process can also influence a mixed methods study's research questions. The double-headed arrow between research questions and methods in [Figure 12.3](#) indicates this back-and-forth relationship. Research questions may be refined or new questions stated as the researcher considers whether initially stated questions are researchable with known methods and available resources (Punch, 2005). In addition, Onwuegbuzie and Leech (2006) discuss how research questions are shaped depending on whether the researcher is using a concurrent or sequential mixed methods approach. Creswell and Plano Clark (2007) also suggest that questions be refined within the context of the selected mixed methods design variant. They recommend that researchers develop a specific mixed methods question (using an issue or procedural format) that will be answered by the process of integrating the quantitative and qualitative strands within the design being used. Therefore, research questions may emerge or be modified as a researcher considers method issues such as the following:

- What questions are consistent with the planned mixed methods design?
- What question will be answered by integrating the quantitative and qualitative strands?
- Are the stated research questions researchable?
- Can the research questions be addressed with the available participants?
- Are there ethical implications that call for mixed research questions?
- Does the need for tools or materials suggest additional research questions?

In practice, researchers pose questions that call for and are adapted to fit within specific mixed methods approaches, such as mixed methods research questions that researchers to the integration procedures of their selected design. For example, after stating quantitative and qualitative research questions in her concurrent study about long-term effects of

traumatic brain injury, Curry (2006) asked a question to guide the comparison of the two sets of results: "How do the qualitative findings corroborate or give meaning to the quantitative results, and vice versa?" (p. 23). Penn (2008) chose a sequential design where he first addressed quantitative research questions and then qualitatively followed up on these initial results for further explanation. Within the context of this design, he stated two mixed methods questions: "1. In what ways does the qualitative multicase study help to explain the quantitative results? 2. How do the quantitative and qualitative data together reveal faculty approaches to improving teaching at a large Midwestern research institution?" (p. 13).

Issues with the research setting or related to the intended participants may lead a researcher to modify mixed research questions or add new questions that turn a previously quantitative or qualitative study into a mixed methods study. For example, a much-needed randomized control trial investigation to answer questions about the relative effectiveness of different treatments for prostate cancer faced great difficulty in adequately recruiting participants to the randomization process. The research team added exploratory questions about the recruitment process, and Donovan et al. (2002) reported what was learned qualitatively and how these qualitative results were used to improve the conduct of the experimental trial. Brady and O'Regan (2009) also describe how their research questions had to change to accommodate methods issues that emerged in relation to participant sampling constraints and ethical considerations within their mixed methods study of the impact of a youth mentoring program. In addition, they reported how methods concerns about how to effectively integrate their data sources led to a new research question focused on the integration procedures. They asked, "What results emerge regarding the potential of this youth mentoring program from comparing the outcome data from the impact study with the case study data from the mentoring pairs?" (p. 276).

We also found that researchers state research questions in response to the need for specific data collection tools, such as a valid instrument. In her National Institutes of Health (NIH) proposal, McWayne (2007) aims to assess the association between Latino family involvement and school readiness outcomes for preschool children. To quantitatively address this question, she needs to first develop a culturally sensitive instrument to measure Latino family involvement. Therefore, she states a preliminary aim to understand family



address this aim qualitatively and then use the information to develop the needed quantitative instrument. In this way, she expects to be able to study the topic in a culturally sensitive way and draw culturally relevant conclusions from the overall study.

Research Questions May Emerge from a Study's Results and Interpretations

Within some mixed methods studies, questions emerge or are refined based on results and the researcher's interpretations of the results. The curved arrow in [Figure 12.3](#) indicates the emergence of questions in response to initial results. Simply because of their complexity, mixed methods studies have the potential for initial results to suggest new research questions, particularly related to the integration of the methods that go beyond the researcher's initial intentions (Bryman, 2006a). In fact, an advantage of using mixed methods is that the researcher can be responsive to unanticipated results and not be confined to predetermined questions or methods (Christ, 2007). This flexibility is useful in exploratory and longitudinal studies where the researcher is unsure of the direction of the study at the start of the research process (Christ, 2007), in sequential designs where questions in subsequent phases are informed by the results of an earlier phase (Teddle & Tashakkori, 2009), and in concurrent studies where questions calling for new integration procedures are suggested by preliminary results (Plano Clark, Garrett, & Leslie-Pelecky, 2009). Several kinds of interpretations may propel the researcher to modify or develop research questions, including results that are unexpected, are contrary to the study's theoretical framework, point to the existence of extreme or outlier cases, bring into question issues of validity, or are divergent and cannot be readily explained (Creswell & Plano Clark, 2007). Therefore, another set of issues that mixed methods researchers consider in regard to generating research questions includes the following:

- Are initial results required before subsequent research questions can be developed?
- Is there sufficient information to interpret the results?
- Do unexpected or surprising results suggest a new kind of question?
- Are the results and interpretations valid, and if not, what questions does this raise?

There are many examples of mixed methods studies where research questions emerged were modified based on initial results and interpretations. For example, Aldridge, Fraser, and



compared with Australian students, had more favorable attitudes toward science despite having less favorable perceptions about their science learning environments. This finding led the researchers to pose new questions about the science learning environments in the two countries for a second qualitative phase to explain the anomalous result. Ras (2009) found that she was having trouble interpreting the findings in her qualitative case study of a school undergoing a self-imposed curricular change process, and thus the preliminary findings raised new questions of interpretation that required quantitative methods. As she addressed these new questions, her qualitative study became a mixed method study. As a final example, Barroso and Sandelowski (2001) describe how a question emerged in regard to the validity of the quantitative scores they obtained from a depression measure in a study of fatigue with participants who were HIV positive. They then used qualitative comments from participants to better understand how they were interpreting the instrument's items.

Writing Research Questions in Mixed Methods Research

We now turn our attention to how researchers write the research questions found within mixed methods research. The triangle in the center of [Figure 12.3](#) illustrates a three-ended continuum of the questions that researchers pose and interpret as more quantitative, more qualitative, or more mixed. Rather than viewing research questions as dichotomized neatly into distinct categories, we recognize that researchers make interpretations within the context of their research endeavor as to whether the questions they have generated are best addressed with quantitative, qualitative, or a combination of information. That said, writers generally agree on common attributes of the questions that researchers interpret as being associated with quantitative, qualitative, or mixed methods, and, like many other writers, we use terms such as *quantitative questions* or *mixed questions* as a shorthand for questions that have these characteristics and are answered with the corresponding forms of data. We begin with a brief review of quantitative and qualitative questions before discussing mixed research questions.



Research Questions Associated with Quantitative Methods

Quantitative researchers tend to use prespecified research questions derived from the literature. This allows quantitative studies to unfold in a linear fashion, from literature to questions to methods. Quantitative questions involve variables, which are characteristics or attributes of individuals and organizations that vary in the sample and that the researcher will measure using numeric scores. They are associated with a wide range of purposes for research, including describing trends and patterns, assessing variances, identifying differences, measuring outcomes, and testing theories. Quantitative questions may be descriptive and focus on participants' responses to individual variables. They often involve more than one variable and fall within two broad categories: questions about relationships among variables or questions about comparisons among groups. In any case, the researcher decides that the descriptions, relationships, or comparisons are assessed best using quantitative data and statistical procedures.

Methodologists offer considerable advice for writing good quantitative questions (e.g., Creswell, 2008; Johnson & Christensen, 2008; Onwuegbuzie & Leech, 2006). Researchers should formulate quantitative research questions in highly specific terms to specify the data and analyses needed to answer them. When stated as questions, they should begin with *how*, *what*, or *why* and use signal terms such as *differ*, *compare*, and *relate* to indicate links between variables. Researchers using deductive logic are more likely to state their quantitative research questions as hypotheses because they may be able to make predictions based on prior research or existing theories. Consider the following example of a quantitative research question: What is the relationship between engineers' ability to work on teams and work satisfaction? This question can be answered by quantitatively measuring the two variables (ability to work on teams and work satisfaction) for many participants and determining the association between them. Research questions that share these attributes fall within the "more QUAN" dimension of [Figure 12.3](#).

Research Questions Associated with Qualitative Methods

Researchers who ask qualitative questions are usually working from an inductive perspective. Therefore, although qualitative research questions can be prespecified, they



the phenomenon under study (Corbin & Strauss, 2008; Punch, 2005). Qualitative researchers use their research questions to determine where to focus their attention, but not to prescribe the direction of their research (Ridenour & Newman, 2008). The inductive purpose of qualitative inquiry differs from quantitative research. Qualitative questions are often associated with purposes for research that call for developing understanding, uncovering meaning, explaining processes, and generating theories. A qualitative research question asks a general, open-ended question about a single phenomenon, process, or issue and provides the researcher with sufficient flexibility and freedom to explore a topic in depth (Corbin & Strauss, 2008).

Good qualitative research questions are broad, but narrow enough to focus on the issues most relevant to the individuals under investigation. A qualitative question identifies the topic area and gives the reader information on what is of interest to the investigator. Creswell (2008) recommends stating qualitative questions in neutral, nondirectional language; identifying only one phenomenon; beginning with the words *what* or *how*; and considering the use of issue or procedural subquestions. The following is an example of a qualitative research question: What is the experience of being part of a team for engineers in a midwestern electric company? The question provides a focus for methods decisions to understand and describe participants' experiences in their own words. Questions that researchers interpret as having these attributes fall toward the "more QUAL" dimension of [Figure 12.3](#).

Research Questions Associated with Mixed Methods

Studies that include questions that the researcher associates with *both* quantitative and qualitative approaches fall along the "more MIXED" dimension of [Figure 12.3](#). Although Newman et al. (2003) explained that one cannot develop an effective typology of research questions for mixed methods, there are typologies of research purposes for which a researcher may state a combination of questions and choose to use a mixed methods approach (e.g., Greene, Caracelli, & Graham, 1989; Newman et al., 2003). Recently, Bryman (2006a) assembled a list of 16 reasons for combining quantitative and qualitative research to

practice. This list includes triangulation, offset weaknesses, completeness, structure and process, different research questions, explanation, unexpected results, instrument development, sampling, credibility, context, illustration, utility of results, confirm and discover, diversity of views, and enhancement.

Across these many reasons for mixed methods research, our examination of the literature and researchers' practice identified four dimensions that describe how researchers write research questions within the context of their mixed methods studies. These dimensions are summarized in [Table 12.1](#) along with hypothetical examples from studies about online interactions. The first two dimensions relate to the rhetorical style used to write the questions and the last two identify how the questions relate to other questions in the study and to the overall research process.

Table 12.1 Dimensions for Writing Research Questions in Mixed Methods Studies

<i>Dimension</i>	<i>Options</i>	<i>Description</i>	<i>Hypothetical Examples From Studies About Online Interactions</i>
Rhetorical style: Format	Question	The researcher writes an interrogative sentence complete with question mark.	1. What online interactions occur in successful and unsuccessful distance courses?
	Aim	The researcher writes a declarative sentence that expresses what is to be accomplished.	1. This study aims to describe the online interactions that occur in successful and unsuccessful distance courses.
	Hypothesis	The researcher writes a statement that predicts an outcome for a research question.	1. Successful distance courses include a richer set of interactions among students and the instructor than those rated as unsuccessful.
Rhetorical style: Level of integration ^a	Separate questions only	The researcher writes separate questions for the qualitative and quantitative strands of the study.	1a. How does online game play relate to study strategies? [QUAN] 1b. What is the process of studying for online game players? [QUAL]

			2b. What factors play a role for people who have meaningful online friendships? [QUAN]
	General, overarching mixed methods question	The researcher writes a broad question that is addressed with both quantitative and qualitative approaches.	1. How can the impact of online dating sites be understood? 2. What is community within an online network?
	Hybrid mixed methods issue question	The researcher writes one question with two distinct parts and uses a quantitative approach to address one part and a qualitative approach to address the other part.	1. How is an effective online course developed and tested? 2. Does hours spent online affect intimacy between romantic couples? If yes, how?

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<i>Dimension</i>	<i>Options</i>	<i>Description</i>	<i>Hypothetical Examples From Studies About Online Interactions</i>
	Mixed methods procedural/mixing question	The researcher writes a narrow question that directs the integration of the qualitative and quantitative strands of the study.	1. What is the relationship between the case studies of online professors and the survey data about their attitudes? 2. How do the follow-up narrative results extend, refute, or illuminate the survey findings about students' experiences of online classes?
	Combination	The researcher combines at least one mixed methods question with separate quantitative and qualitative questions.	1a. How do adolescents use social networking sites? [MM] 1b. What theory explains adolescents' process of using social networking sites? [QUAL] 1c. How are the identified factors related? [QUAN]



			generalize the quantitative grounded theory model? [MM]
The relationship of questions to other questions	Independent	The researcher writes two or more research questions that are related, and one question does not depend on the results of the other question.	1a. How do pre-teenagers perceive online bullying? 1b. How frequently do pre-teenagers experience acts of online bullying? 2a. What are managers' perceptions of teleconferencing? 2b. What factors play a role in employee satisfaction with teleconferencing?
	Dependent	The researcher writes a question that depends on the results of another research question.	1a. Which strategies do blog writers employ to widen their audience? 1b. What influences the use of these strategies? 2a. What themes emerge to describe the experience of online dating? 2b. How frequently do each of these themes occur for online daters?



<i>Dimension</i>	<i>Options</i>	<i>Description</i>	<i>Hypothetical Examples From Studies About Online Interactions</i>
The relationship of questions to the research process	Predetermined	The researcher writes a question based on literature, practice, personal tendencies, and/or disciplinary considerations at the outset of the study.	1. How do college students perceive the impact of Web sites like YouTube? 2. What ways has online chatting affected work productivity?
	Emergent	The researcher formulates a new or modified question during the design, data collection, data analysis, or interpretation.	1. To what extent do people who are not part of online global communities experience the themes that emerged from the qualitative data? 2. What are the most effective online educational tools for first graders?

NOTE: QUAN = quantitative; QUAL = qualitative; MM = mixed methods.

a. *Level of integration* refers to the rhetorical style of the written research questions. As mixed methods studies, the expectation is that *all* of the hypothetical studies would integrate the qualitative and quantitative strands.

Dimension 1—Rhetorical style: Question format. As discussed at the beginning of this chapter, we were open to considering research questions that investigators stated in different formats. In our review of mixed methods practice, we found that mixed methods researchers use each of the described formats. That is, mixed methods researchers state their research questions in the form of

- questions,
- aims, and/or
- hypotheses.

The question format was common in dissertations and used in many mixed methods journal articles. This use may reflect audience expectations across disciplines and publication venues as well as an overall emphasis on the research question in mixed methods research. In addition, we found that study aims were used extensively in the proposal abstracts that we reviewed and that this use occurs in response to requirements set by funding agencies.

Although less common, we also found examples of questions stated as hypotheses in a few

articles and dissertations, and they were usually paired with qualitative questions. For example, Myers and Oetzel (2003) wrote one qualitative research question (RQ) and four quantitative hypotheses (H1–H4), which included the following:

RQ: What are the dimensions of organizational assimilation? (p. 440)

H1: The dimensions of organizational assimilation correlate positively with job satisfaction. (p. 441)

Dimension 2—Rhetorical style: Level of integration. Any research approach can use research questions written in different formats, but there is an additional dimension specific to the rhetorical style of questions found within mixed methods studies. This dimension describes the level of integration conveyed in the writing of the questions. Keep in mind that we expect *all* mixed methods studies to meaningfully integrate the quantitative and qualitative strands of the study. Therefore, rather than indicate the extent to which results are integrated, the level-of-integration dimension assesses the extent to which the research questions are written in an integrated style. Broadly speaking, mixed methods researchers state either separate quantitative and qualitative questions or mixed methods research questions or both. A mixed methods research question is defined as a single question that “embeds both a quantitative research question and a qualitative research question within the same question” (Onwuegbuzie & Leech, 2006, p. 483). The concept of mixed methods research questions is relatively new and thus far has received only minimal attention in the literature (Creswell & Plano Clark, 2007; Onwuegbuzie & Leech, 2006; Tashakkori & Creswell, 2007). Drawing from the literature and available reports, we found several style options in use by researchers: (a) separate quantitative and qualitative questions only; (b) general, overarching mixed methods questions; (c) hybrid mixed methods issue questions; and (d) mixed methods procedural/mixing questions.

- *Researchers may state separate quantitative and qualitative questions only.* As Teddlie and Tashakkori (2009) discuss, all mixed methods studies include at least two questions—one qualitative, one quantitative. Therefore, it is natural for researchers to write separate questions. Separate questions are two or more questions that the research associates with at least two different methods. For example, *What is this?* and *What that?* reflect separate questions if *this* is explored qualitatively and *that* is examined quantitatively. Researchers distinguish their qualitative and quantitative questions

the use of labels (i.e., *qualitative* or *quantitative*) in headings or parenthetical comments. The phrasing of the questions, such as using language traditionally associated with one approach, can also indicate their nature. For example, Webster (2009) wrote two quantitative and two qualitative questions, and one of each is mentioned here:

Is there a statistically significant difference in nursing student empathy, as measured by the Interpersonal Reactivity Index (IRI), after a psychiatric nursing clinical experience? What are student perceptions of working with mentally ill clients during a psychiatric nursing clinical experience? (pp. 6–7)

The language of the first question makes it clear that it is quantitative because the researcher uses the term *statistically significant*. The second question was explored qualitatively through interviews. Some researchers state separate questions but do not provide clear indications that they are associating different questions with different methods. In these cases, the qualitative or quantitative nature of the question can be inferred only in the context of the entire study.

- *Researchers may state an overarching mixed methods question.* An overarching mixed methods question is one broad issue-focused question such as *What is this?* which the researcher interprets as requiring *both* quantitative and qualitative information to answer. As such, these questions emphasize the overall integrated nature of the study as opposed to breaking questions into separate components (Yin, 2006). From our review, we share three examples of researchers stating overarching mixed methods questions. Plano Clark et al. (2009) asked:

How do the alumni of the [nontraditional science] graduate education program perceive the impact of their participation? (pp. 5–6)

They considered the word *perceive* as a neutral word and explained that their question is best suited to a mixed methods design because they required qualitative and quantitative information to adequately describe the perceptions of impact. A study by Igo, Kiewra, and Bruning (2008) is more explicit:

How do different copy-and-paste notetaking interventions affect college students' learning of Web-based text ideas? The first two words in this question indicate that a mixed methods approach is warranted, with *do* indicating the need for an experiment and *how* indicating the need for a qualitative follow-up. (p. 150, italics in original)



The first phase of the study was an experimental design in which quantitative data were collected in the form of scores on learning tasks. In the second phase, the authors analyzed student notes and interviews to extend the findings from the experiment. Thus, the authors justify the use of mixed methods and state how their language indicates the different types of data. As another interesting example, Fitzpatrick (2008) stated four overarching questions labeled as quantitative and qualitative. Each question was associated with data collected with both methods. One such question was the following:

What specialized skills do urban teachers rely upon to be successful within the urban setting? (p. 23)

- *Researchers may state a hybrid mixed methods issue question.* Hybrid questions are single questions about the content of the study that include two distinct parts, with each part associated with either a qualitative or quantitative approach. *What is this and that?* and *How and why does that occur?* are examples of hybrid questions. For example, Nakagami (2006) stated a hybrid aim in a proposal for funding:
The proposed study will examine the relationship and explore the causal ordering between consumer working alliance, hope, and psychosocial functioning outcomes. (Paragraph 1)

In the initial phase of this study, the investigator plans to gather quantitative structured interviews from participants to assess the interactions of working alliance, hope, and psychosocial outcomes for schizophrenic patients. The subsequent phase consists of qualitative open-ended interviews to further explore the quantitative results. Another hybrid question was found in a dissertation by Emert (2008). The question was this:

Does participation in the Fulbright Teacher Exchange Program impact the intercultural competence of participants? If yes, how? (p. 6)

The first part is more quantitative in nature because the researchers assessed intercultural development through a pretest and posttest survey. The second part indicates a more qualitative orientation because they explored the impact through interviews.

- *Researchers may state a mixed methods procedural/mixing question.* The final rhetorical style occurs when authors state a question about the study's integration using a procedural focus. These questions are written so that they explicitly direct the procedures for mixing the strands of a mixed methods study, and they are tied to the

following: *What is the congruence between this and that? What is a culturally sensitive instrument based on that? How does this explain that?* Keep in mind that researchers using procedural questions do not conduct their studies for the purpose of employing certain procedures. Instead, procedural questions are one rhetorical option for writing research questions in mixed methods research. Procedural questions may be particularly useful for providing initial direction to a study where topics are expected to emerge, highlighting the use of an integrated design, foreshadowing integration procedures for audiences unfamiliar with mixed methods, and conveying the complexity inherent in mixed methods designs.

We found numerous examples of mixed methods procedural questions. LaPrairie, Slate, Schulte, and Onwuegbuzie (2009) conducted a concurrent study where they gathered qualitative information about student perceptions of best and poor college professors as well as quantitative information about student characteristics. They asked the following question, which indicates how they will link their two data sets in a sequential analysis:

What is the difference in endorsed themes of best college professors as a function of gender, ethnicity, student status, and generation status? (p. 9)

In addition to the four general questions noted earlier, Fitzpatrick's (2008) dissertation about urban music teaching included one procedural question:

In what ways do the survey and case study align with one another? (p. 23)

She gathered survey data from music teachers in one strand of her study and conducted case studies consisting of interviews and observations with four music teachers in the other strand. The two sets of results were compared and integrated to answer the procedural question. McWayne (2007) stated three aims in her proposal to conduct a sequential study that begins with a qualitative phase and builds to a second quantitative phase. Between her qualitative and quantitative aims, she stated a procedural mixing aim that highlights how she plans to connect the two phases:

(b) [to] create a culturally relevant, multidimensional quantitative instrument with items that capture the specific behaviors Latino parents engage in to support their preschool children's early educational success [as identified in the qualitative phase] (Paragraph 1)



In a sequential study starting with a quantitative phase, Starker's (2008) mixing question was this:

How do the qualitative responses enhance the interpretation of preservice teachers' [quantitative Web-based instruments] scores? (p. 28)

The quantitative component of this study assessed effectiveness of delivering content using a Web-based tool. Qualitative data were collected in a second phase to enhance the interpretation of the quantitative results as foreshadowed in the mixing question.

- *Researchers may combine rhetorical styles.* Although we have focused on separate rhetorical options, researchers may find they are confronted with a tension between wanting to state questions that emphasize the integrated nature of study and those that emphasize the connection between questions and methods. Therefore, many researchers combine multiple styles. Combinations work well because the different styles emphasize different aspects of a mixed methods study including the content issue, the specific questions that call for different methods, and the integration procedures. For example, Scott and Sutton (2009) combined an overarching question, separate quantitative questions, and a procedural mixed methods question when they wrote:

The overarching question was what trends appear in teachers' emotions during professional development and how do these emotions relate to acceptance of the writing process based on a mixed methods design. Subquestions included

Phase 1

1. What are the trends in teachers' emotions during the year in which they are asked to use the writing process?
2. What changes do teachers report in their teaching practices?
3. How are trends in emotions related to changes in practices?

Phase 2

4. How do teachers' reflections on emotions and changes in teacher practices illuminate understanding of the relationships between emotions and change in teacher practices as found in Phase 1? (p. 153)

Dimension 3—The relationship of questions to other questions. Because mixed methods researchers state at least two research questions, another important dimension is how the questions relate to each other. The relationship among the questions is important because it

quantitative and qualitative components of the study. Two alternatives are available: The questions may be related, but independent of each other, or one question may depend on the results of another question.

- *The research questions may be independent of each other.* Research questions are considered as independent when Question B does not depend on the results of Question A and vice versa. That is, asking *What is this?* and *What is that?* is the same as asking *What is that?* and *What is this?* Although the questions relate to the same larger content topic, there is no implied order to the questions, and as such, the quantitative and qualitative components of the study may be implemented in parallel and independently from each other. Two of Brady and O'Regan's (2009) research questions provide a good example of independent questions:

What is the impact of the BBBS [Big Brothers Big Sisters] program on the participating youth? How is the program experienced by stakeholders? (p. 273)

Both questions relate to understanding the BBBS mentoring program. The first research question was addressed through surveys of youth that related to the impact of the program, and the second question was answered through interviews with stakeholders.

- *One research question may be dependent on the results of another question.* Dependent questions occur when one question depends on the results of another question within the study. Asking *What is this?* and then *What is that?* is not the same as asking *What is that?* and then *What is this?*; one needs to know the *this* before one can study the *that*. Dependent questions generally call for the use of sequential designs (Creswell & Plano Clark, 2007) or sequential analytic techniques, such as data transformation, where one type of data is dependent on the other type, such as when qualitative themes are transformed into quantitative counts (Onwuegbuzie & Teddlie, 2003). Biddix's (2009) two-phase study represents an example of using dependent questions:

(1) What career paths for women lead to the community college SSAO [Senior Student Affairs Officer]? (2) What influences path decisions to change jobs or institutions? (p. 3)

In the first phase of the study, SSAO résumés were the primary source of data, informing an initial network analysis. The second phase consisted of interviews with SSAOs, which sought to explain the paths identified from the network analysis. Eli and Mohr-Schroeder (2009) also stated dependent questions in their study of math teachers:



What types of mathematical connections do prospective middle grades teachers

connections? What is the relationship between prospective middle grades teachers' mathematics knowledge for teaching geometry and the types of mathematical connections made while completing investigative mathematical tasks? (p. 16)

The authors qualitatively described the types of mathematical connections and then used data transformation to quantitatively score the results about connections and relate them to other quantitative variables. Thus, the second research question depended on the results of the first question.

Dimension 4—The relationship of questions to the research process. As summarized in [Figure 12.3](#), research questions are often generated at the start of a study's research process, but they also may emerge as the study's method decisions and results come into play. Teddlie and Tashakkori (2009) suggest that questions in concurrent/parallel studies are generated at the project's onset. That is, they are predetermined or preset at the start. Emergent questions are also possible and even probable in many mixed method studies. Tashakkori and Creswell (2007) discuss the practice of writing research questions for each phase of a sequential study as it evolves. Plano Clark et al. (2009) discussed how they addressed their overarching question with a concurrent design, but new mixing questions emerged as they examined initial results in their study. Therefore, broadly speaking, research questions within mixed methods studies are either predetermined or emergent within the process of research.

- *Research questions may be predetermined.* When research questions are predetermined, Question X is stated at the beginning of the study based on the researcher's understanding of the literature and practice, personal tendencies, or disciplinary considerations. Wade (2008) asked a predetermined question:
What affect did learning styles of children with autism have on improving their behavior? (p. 7)

The author collected pretest and posttest qualitative and quantitative data to address this question in a concurrent design. From the outset, this researcher determined that qualitative data were intended to provide more in-depth understanding, and thus the research questions were predetermined.

- *Research questions may be emergent.* Emergent questions are formed during the

methods, an unexpected finding, or a new understanding. For example, Way, Stauber, Nakkula, and London (1994) described the questions that emerged from their unexpected quantitative result, namely that students from two schools had different patterns in the relationship between substance use and depression. They formulated two new questions, one qualitative and one mixing:

- (a) How might students with similarly high depression levels across the two schools differ in their perspectives on substance use? (b) How might these possible differences in perspectives begin to explain why depression and substance use are differentially related across the schools? (p. 343)

Christ (2007) also illustrated how new questions emerge within an exploratory, longitudinal mixed methods study. Taking advantage of unforeseen circumstances of a budget reduction at one of his study sites, he added new questions to a third phase of his study when he asked:

- (1) How have disability support services at an institutional level changed as a result of declining funds? and (2) Are there differences in the way students and staff view the effectiveness of disability support services? (p. 232)

That is, he posed a new set of mixed questions within the context of an ongoing mixed methods study.

As the set of dimensions and corresponding options illustrate, mixed methods researchers have alternatives for writing research questions in the context of their studies. Together, they provide a framework of the evolving conventions for writing mixed research questions. In addition, researchers frequently combine two or more options for each dimension in their published reports. For example, an author may write questions and hypotheses or have both predetermined and emergent questions. Based on these dimensions, we offer a list of recommendations for writing research questions for mixed methods research in [Box 12.1](#).

Box 12.1: Recommendations for Writing Mixed Research Questions for Mixed Methods Studies

1. When conducting a mixed methods study, keep your research questions central to your design process. Use methods that are best suited to answering your questions but also ensure that your questions are responsive to important design and interpretation issues.
2. Reflect critically on the origins of your research questions when conducting a mixed

report your study to share the challenges that are inherent in conducting mixed methods research.

3. When writing your mixed research questions, select the format that matches the norms of your audience. If there is a choice of format, use the question format to highlight their importance within the conduct of mixed methods research.
4. Use consistent terms to refer to variables or phenomena examined across multiple questions.
5. Use a combination of rhetorical styles to convey the larger question guiding the study, the specific subquestions associated with quantitative and qualitative methods, and an issue or procedural mixed methods question that directs and foreshadows how and why the strands will be integrated.
6. Relate the question style and content to the specific mixed methods design being used. For example, dependent questions should be associated with either a sequential design or sequential procedures (such as data transformation).
7. If the questions are independent, list them in their order of importance. If the questions are dependent, list them in order of what has to be answered first.
8. Determine whether the study is best addressed with predetermined or emergent questions or both. Even if starting with predetermined questions, be open to the possibility of emergent questions. When questions emerge, explicitly discuss the process by which they emerged and the considerations that led to posing new questions.

Evaluating Mixed Research Questions

Issues of quality in mixed methods research are receiving increased attention (see O'Cathain, 2010 [this volume]). Due to the varied nature and intent of quantitative, qualitative, and mixed research questions, it is a challenge to specify specific criteria useful for evaluating each of these forms. Methodologists have discussed general criteria that indicate good research questions (e.g., Creswell, 2008; Punch, 2005; Teddlie & Tashakkori, 2009), and these can apply equally well to the context of questions within mixed methods research. Building from these ideas, we suggest the following considerations as pertinent to mixed research questions.

- *Mixed questions should be researchable.* The questions should be answerable using a combination of available methods and integration techniques. The questions should also be manageable given the resources and expertise of the researcher or research team.
- *Mixed questions should be important.* Recognizing that mixed research questions are

contribute to knowledge about phenomena that are salient within our communities of practice. Their importance should be at least partly documented through multiple references to the literature.

- *Mixed questions should have conceptual clarity.* Questions should be stated in ways that make them easy to understand and clarify what the researcher wants to answer in the study. This may warrant a great deal of reflection on the part of researchers to truly understand what they are attempting to address. With mixed research questions, this also means that researchers should make it clear how they are interpreting the questions in terms of the quantitative/qualitative/mixed continua. This clarity can be aided by using signal terms that are readily identified with each approach (e.g., *statistically significant, narrative, or integration*) or by including an explanation of how the questions are being interpreted within the study's context.
- *There should be congruence among the mixed questions, overall mixed methods design, and results.* Research questions need to have a good fit with the methods and results of the study. That is, the underlying logic of what questions are being asked and how the researcher goes about answering them with mixed methods should be apparent, understandable, and defensible. This congruence can be enhanced in a report by organizing the structure of the methods, results, and interpretation sections to match the statement of the questions.
- *Mixed questions should convey the need for integration or foreshadow an integrated approach or both.* The issue of integration has become central to thinking about all aspects of mixed methods research (Teddlie & Tashakkori, 2006). Mixed methods research requires that the quantitative and qualitative aspects of a study be meaningfully related to each other, and the research questions should facilitate this process. The level of integration conveyed by the questions can be enhanced through the use of mixed methods research questions (overarching, hybrid, procedural, or a combination of these forms). Mixed methods researchers should avoid the use of only separate quantitative and qualitative questions, which may work to keep the methods separate in the implementation of the study (Yin, 2006).

Conclusions

In conclusion, this chapter has attempted to take another step in the work to conceptualize how research questions are generated and stated within the context of mixed methods research. We described existing models of how mixed methods studies are designed in response to research questions and then specified a model that focused on how such questions are generated in the research process and in response to personal and disciplinary contexts. We also delineated a set of dimensions that describe how researchers



write the questions for their mixed methods studies as well as criteria for evaluating the quality of these questions.

Like the process of conducting mixed methods research itself, mixed research questions are necessarily complex and dynamic. The field of mixed methods is only beginning to think about the nature of these questions. Researchers will continue to expand the types of questions they ask and the ways that they choose to combine questions and methods. As with quantitative and qualitative methods, conventions for developing and writing mixed questions are starting to form within communities of practice and will continue to become established as methodologists and researchers alike further examine the practice of mixed methods research. We encourage all scholars working in the area of mixed methods to report their reflections about their mixed research questions so that the entire community of mixed methods practice can better understand and consider this essential element of our research endeavors.

Research Questions and Exercises

1. Define research questions and discuss their importance for conducting mixed methods research.
2. Discuss the two models of mixed methods research design in [Figure 12.2](#). Which model best fits with your own process for designing a mixed methods study? Explain your ideas.
3. Examine the research questions in a recent mixed methods study. How did the author link the research questions to the methods in the study?
4. Consider a mixed methods study that you are planning to conduct or have conducted. How did you generate the research questions? List the salient contexts that influenced these questions. In what ways do you find these influences to be supportive or unsupportive of your research efforts?
5. Find a published mixed methods study that used a concurrent design. Locate the authors' research questions and identify which options they used for each of the dimensions for writing mixed questions.
6. Find a published mixed methods study that used a sequential design. Locate the authors' research questions and identify which options they used for each of the dimensions for writing mixed questions.
7. Using the evaluation criteria outlined in this chapter, critique the research question posed in a mixed methods study. What changes would you suggest?
8. Write good mixed questions for a study that you would like to conduct that calls for a

in [Table 12.1?](#)

Note

1. As of September 1, 2009, the CRISP database has been replaced by the Research Portfolio Online Reporting Tools Expenditures & Results (RePORTER) database found at <http://projectreporter.nih.gov/reporter.cfm>

References

- Aldridge, J. M., Fraser, B. J., & Huang, T. I. (1999). Investigating classroom environments in Taiwan and Australia with multiple research methods. *Journal of Educational Research*, 93(1), 48–62.
- Barroso, J., & Sandelowski, M. (2001). In the field with the Beck Depression Inventory. *Qualitative Health Research*, 11, 491–504.
- Bernardi, L., Keim, S., & von der Lippe, H. (2007). Social influences on fertility: A comparative mixed methods study in Eastern and Western Germany. *Journal of Mixed Methods Research*, 1(1), 23–47.
- Biddix, J. P. (2009, April). *Women's career pathways to the community college senior student affairs officer*. Paper presented at the meeting of the American Educational Research Association, San Diego, CA.
- Biesta, G. (2010). Pragmatism and the philosophical foundations of mixed methods Research. In A. Tashakkori & C. Teddlie (Eds.), *SAGE handbook of mixed methods in social & behavioral research* (2nd ed.). Thousand Oaks, CA: Sage.
- Bradley, E. H. (2007). *Hospital strategies to improve outcome performance* (Grant No. 1R01HS016929-01). Abstract retrieved from CRISP database: <http://crisp.cit.nih.gov/>
- Brady, B., & O'Regan, C. (2009). Meeting the challenge of doing an RCT evaluation of youth mentoring in Ireland: A journey in mixed methods. *Journal of Mixed Methods Research*, 3, 265–280.
- Bryman, A. (2006a). Integrating quantitative and qualitative research: How is it done? *Qualitative Research*, 6, 97–113.
- Bryman, A. (2006b). Paradigm peace and the implications for quality. *International Journal of*



Bryman, A. (2007). Barriers to integrating quantitative and qualitative research. *Journal of Mixed Methods Research*, 1, 8–22.

Christ, T. W. (2007). A recursive approach to mixed methods research in a longitudinal study of postsecondary education disability support services. *Journal of Mixed Methods Research*, 1(3), 226–241.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle River, NJ: Pearson.

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.

Curry, E. M. (2006). *Long-term effects of traumatic brain injury as perceived by parental and spousal caregivers: A mixed methods study*. Retrieved from ProQuest Dissertations & Theses. (AAT 3222555)

Denscombe, M. (2008). Communities of practice: A research paradigm for the mixed methods approach. *Journal of Mixed Methods Research*, 2(3), 270–283.

Donovan, J., Mills, N., Smith, M., Brindle, L., Jacoby, A., Peters, T., et al. (2002). Improving design and conduct of randomised trials by embedding them in qualitative research: ProtecT (prostate testing for cancer and treatment) study. *British Medical Journal*, 325, 766–769.

Edwards, L. M., & Lopez, S. J. (2006). Perceived family support, acculturation, and life satisfaction in Mexican American youth: A mixed-methods exploration. *Journal of Counseling Psychology*, 53, 279–287.

Eli, J. A., & Mohr-Schroeder, M. J. (2009, April). *An exploratory study of prospective middle grades teachers' mathematical connections while completing tasks in geometry*. Paper presented at the meeting of the American Educational Research Association, San Diego, CA.

Emert, H. A. (2008). *Developing intercultural competence through teaching abroad with Fulbright: Personal experience and professional impact*. Retrieved from ProQuest Dissertations & Theses. (AAT 3308069)

Feldon, D. F., & Kafai, Y. B. (2008). Mixed methods for mixed reality: Understanding users' avatar activities in virtual worlds. *Educational Technology Research and Development*, 56(5–6), 575–593.

Fitzpatrick, K. R. (2008). *A mixed methods portrait of urban instrumental music teaching*. Retrieved from ProQuest Dissertations & Theses. (AAT 3303647)



Green, S. F. (2003). "What do you mean 'what's wrong with her?'" Stigma and the lives of

Greene, J. C. (2007). *Mixed methods in social inquiry*. San Francisco: Jossey-Bass.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*, 11(3), 255–274.

Greene, J., & Hall, J. (2010). Dialectics and pragmatism: Being of consequence. In A.Tashakkori & C.Teddlie (Eds.), *SAGE handbook of mixed methods in social & behavioral research* (2nd ed.). Thousand Oaks, CA: Sage.

Hesse-Biber, S. (2010). Feminist approaches to mixed methods research: Linking theory and praxis. In A.Tashakkori & C.Teddlie (Eds.), *SAGE handbook of mixed methods in social & behavioral research* (2nd ed.). Thousand Oaks, CA: Sage.

Hodgkin, S. (2008). Telling it all: A story of women's social capital using a mixed methods approach. *Journal of Mixed Methods Research*, 2(3), 296–316.

Igo, L. B., Kiewra, K. A., & Bruning, R. (2008). Individual differences and intervention flaws: A sequential explanatory study of college students' copy-and-paste note taking. *Journal of Mixed Methods Research*, 2(2), 149–168.

Johnson, B., & Christensen, L. (2008). *Educational research: Quantitative, qualitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33, 14–26.

Kuhn, T. S. (1970). *The structure of scientific revolutions* (2nd ed.). Chicago: University of Chicago Press.

LaPrairie, K., Slate, J. R., Schulte, D. P., & Onwuegbuzie, A. J. (2009, April). *A mixed analysis of college students' best and worst college professors*. Paper presented at the meeting of the American Educational Research Association, San Diego, CA.

Maxwell, J. A., & Loomis, D. M. (2003). Mixed methods design: An alternative approach. In A.Tashakkori & C.Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (pp. 241–271). Thousand Oaks CA: Sage.

Maxwell, J. A., & Mittapalli, K. (2010). Realism as a stance for mixed method research. In A.Tashakkori & C.Teddlie (Eds.), *SAGE handbook of mixed methods in social & behavioral research* (2nd ed.). Thousand Oaks, CA: Sage.

McWayne, C. (2007). *Latino family involvement and children's school readiness: A mixed methods study* (Grant No. 1R03HD050363-01A2). Abstract retrieved from CRISP database: <http://crisp.cit.nih.gov/>

Mertens, D. M., Bledsoe, K. I., Sullivan, M., & Wilson, A. (2010). Utilization of mixed methods

methods in social & behavioral research (2nd ed.). Thousand Oaks, CA: Sage.

Miall, C. E., & March, K. (2005). Open adoption as a family form. *Journal of Family Issues*, 26(3), 380–410.

Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1), 48–76.

Myers, K. K., & Oetzel, J. G. (2003). Exploring the dimensions of organizational assimilation: Creating and validating a measure. *Communication Quarterly*, 51(4), 438–457.

Nakagami, E. (2006). *Treatment processes in psychosocial rehab services* (Grant No. 1F31MH078366-01). Abstract retrieved from CRISP database: <http://crisp.cit.nih.gov/>

Newman, I., Ridenour, C. S., Newman, C., & DeMarco, G. M. P., Jr. (2003). A typology of research purposes and its relationship to mixed methods. In A.Tashakkori & C.Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 167–188). Thousand Oaks, CA: Sage.

O'Cathain, A. (2010). Assessing the quality of mixed methods research: Toward a comprehensive framework. In A.Tashakkori & C.Teddlie (Eds.), *SAGE handbook of mixed methods in social & behavioral research* (2nd ed.). Thousand Oaks, CA: Sage.

O'Cathain, A., Murphy, E., & Nicholl, J. (2007). Why, and how, mixed methods research is undertaken in health services research in England: A mixed methods study. *BMC Health Services Research*, 7(85): doi:10.1186/1472-6963-7-85.

Onwuegbuzie, A. J., & Leech, N. L. (2006). Linking research questions to mixed methods data analysis procedures. *The Qualitative Report*, 11(3), 474–498. Retrieved July 14, 2009, from <http://www.nova.edu/ssss/QR/QR11-3/onwuegbuzie.pdf>

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.

Owen-Smith, A. (2007). *Complementary and alternative medicine use among African-Americans with AIDS* (Grant No. 1F31AT004553-01). Abstract retrieved from CRISP database: <http://crisp.cit.nih.gov/>.

Penn, J. D. (2008). *Faculty approaches to improving teaching: A mixed methods case study*. Retrieved from ProQuest Dissertations & Theses. (AAT 3331438)

Plano Clark, V. L. (2005). Cross-disciplinary analysis of the use of mixed methods in physical education research, counseling psychology, and primary care (Doctoral dissertation, University of Nebraska-Lincoln, 2005). *Dissertation Abstracts International*, 66, 02A.



Plano Clark, V. L. (in press). *The adoption and practice of mixed methods: U.S. trends in federally funded health-related research*. Qualitative Inquiry.

Plano Clark, V. L., Garrett, A. L., & Leslie-Pelecky, D. L. (2009). Applying three strategies for integrating quantitative and qualitative databases in a mixed methods study of a nontraditional graduate education program. *Field Methods*. doi: 10.1177/1525822X09357174

Punch, K. F. (2005). *Introduction to social research: Quantitative and qualitative approaches* (2nd ed.). London: Sage.

Randolph, J. J. (2008). *Multidisciplinary methods in educational technology research and development*. Hämeenlinna, Finland: HAMK University of Applied Sciences. Retrieved September 15, 2009, from http://justusrandolph.net/articles/multidisciplinary_methods.pdf

Ras, N. L. (2009, April). *Multidimensional theory and data interrogation in educational change research: A mixed methods case study*. Paper presented at the meeting of the American Educational Research Association, San Diego, CA.

Ridenour, C. S., & Newman, I. (2008). *Mixed methods research: Exploring the interactive continuum* (2nd ed.). Carbondale: Southern Illinois University Press.

Scott, C., & Sutton, R. E. (2009). Emotions and change during professional development for teachers: A mixed methods study. *Journal of Mixed Methods Research*, 3(2), 151–171.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Starker, T. V. (2008). *Examining preservice teachers' cognitive engagement, knowledge, and self-efficacy of culturally responsive teaching using a web-based case study module: A mixed methods approach*. Retrieved from ProQuest Dissertations & Theses. (AAT 3309208)

Stirman, S. (2007). Influences on the sustainability of evidence-based psychotherapies (Grant No. 1K99MH080100-01A1). Abstract retrieved from CRISP database: <http://crisp.cit.nih.gov/>

Tashakkori, A., & Creswell, J. W. (2007). Exploring the nature of research questions in mixed methods research [Editorial]. *Journal of Mixed Methods Research*, 1(3), 207–211.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.

Teddlie, C., & Tashakkori, A. (2006). A general typology of research designs featuring mixed methods. *Research in the Schools*, 13, 12–28.

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research*. Thousand Oaks, CA: Sage.

Wade, V. J. (2008). *Active intervention: Kinesthetic learning style leavens the lump of student achievement of autistic students*. Retrieved from ProQuest Dissertations & Theses. (AAT



Way, N., Stauber, H. Y., Nakkula, M. J., & London, P. (1994). Depression and substance use in two divergent high school cultures: A quantitative and qualitative analysis. *Journal of Youth and Adolescence*, 23(3), 331–357.

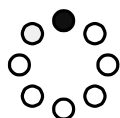
Webster, D. (2009). *Creative reflective experience: Promoting empathy in psychiatric nursing*. Retrieved from ProQuest Dissertations & Theses. (AAT 3312911)

Yin, R. K. (2006). Mixed methods research: Are the methods genuinely integrated or merely parallel? *Research in the Schools*, 13(1), 41–47.

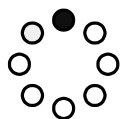
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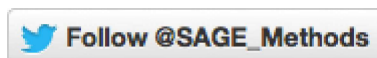
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