

## Chapter 9

# From Mixed-Methods Research to a Journal Article

**Abstract** Mixed methods research has been referred to as the “third paradigm” because, at its best, it is a skillful blend of the first two research paradigms: quantitative and qualitative. This chapter begins with the validity issues that need to be addressed when seamlessly merging research methods with distinctively different philosophies and methods. It then supports the reader in writing each component of a mixed methods research article. The chapter includes: activities that build insight into the third paradigm, specific examples drawn from the published literature, and guidelines for composing each component of the written report. The chapter concludes with identifying suitable outlets for mixed methods research and supplying criteria for evaluation of the mixed methods journal article.

A researcher wants to study how the professionals in her field develop an ethical code and professional dispositions. There is a quantitative dimension to her basic questions, namely, do they know the main components of the code and can they pass an objective item test on it? There is also a qualitative aspect to her question: Do they, when faced with an ethical decision during their practicum, turn to the code as support for their actions? When conducting research, there are many situations such as this one where quantitative approaches alone and qualitative approaches alone will not suffice. Mixed methods research combines qualitative and quantitative methodologies, which is a research paradigm that is gaining acceptance and use across disciplines (Creswell & Plano Clark, 2011). Such recognition is observed in the publications found in journal articles, conference proceedings, and books as well as the founding of several mixed methods research journals (e.g. *International Journal of Multiple Research Approaches*, *Journal of Mixed Methods Research*) and the establishment of special interest groups in professional organizations (Creswell & Plano Clark, 2011). In addition, the publication of the *Handbook of Mixed Methods in Social and Behavioral Research* (Tashakkori & Teddlie, 2010), which is the most comprehensive textbook in this area, has provided researchers with some theoretical and practical tools for conducting mixed methods research. Mixed methods research (also referred to as mixed research) is sometimes referred to as the third research paradigm since qualitative and quantitative are the initial two paradigms (Johnson, Onwuegbuzie, & Turner 2007). Mayring (2007) calls mixed methods research “a new star in the social science sky” (p. 1); “it is an intuitive way

of doing research that is constantly being displayed through our everyday lives” (Creswell & Plano Clark, 2011, p. 1).

**Online Tool** Watch the YouTube video of John Creswell, a leading textbook author and editor/founder of the *Mixed Methods Research Journal*, answer the question: What Is Mixed Methods Research? Posted at: [www.youtube.com/watch?v=1OaNiTlpyX8](http://www.youtube.com/watch?v=1OaNiTlpyX8).

To illustrate the complementarity of quantitative and qualitative approaches, consider the metaphor of commentators at a national sporting event. Most of the time, they work in teams of two people. One person is primarily responsible for describing a linear, play-by-play unfolding of the game (a more quantitative approach). The second team member—often referred to as the “color commentator” highlights individual stories and details about the individuals on the playing field (a more qualitative point of view). The contributions of each member of the broadcasting team are equally valuable (Creswell & Plano Clark, 2011). Together, they offer a version of “mixed methods thinking” that results in two different, yet complementary perspectives of the same phenomenon. At its best, mixed methods research “actively invites us to participate in dialogue about multiple ways of seeing and hearing, multiple ways of making sense of the social world, and multiple standpoints on what is important and to be valued and cherished” (Greene, 2007, p. 20). The third paradigm fulfils its potential when it affords researchers the opportunity to better address their research questions (or problems), when they are able to appreciate its usefulness while using it and when they are well aware of its challenges (Creswell & Plano Clark, 2011).

The purpose of this methodological chapter is to (a) describe mixed methods research as the third research paradigm in educational research, (b) review several approaches in writing the research report, (c) describe a theoretical framework with examples for writing a publishable mixed methods research article, (d) identify possible outlets to publish research reports, and (e) provide a way to evaluate the quality of a mixed methods research report.

**Online Tool** Southern Alabama University has posted a document that analyzes the strengths and weaknesses of quantitative, qualitative, and mixed methods research at: <http://www.southalabama.edu/coe/bset/johnson/lectures/lec14.htm>.

## Mixed Methods Research: The Third Paradigm

For more than a century, the advocates of quantitative and qualitative research paradigms have engaged in an ardent dispute. The last several decades have witnessed intense and sustained debates about quantitative and qualitative research paradigms. Unfortunately, this can create a divide between quantitative and qualitative researchers, even causing them to see themselves as being in competition with each other (Johnson & Onwuegbuzie, 2004). These researchers’ debates concentrate on the *differences* between quantitative and qualitative methodologies instead of the *similarities* (Onwuegbuzie & Leech, 2005). Tashakkori and Creswell (2007) define mixed methods as “...research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry” (p. 4). In order to achieve this, researchers need to fulfill at least six roles, as highlighted in Table 9.1.

As with all decisions about selection of a research method, writers of mixed methods research reports need to provide a rationale for their decision to combine qualitative and quantitative approaches within the same study. To determine whether mixed methods are justified, try answering the five questions that follow.

Will the use of mixed methods...

1. Attain greater comprehensiveness in the research?
2. Aid in more fully understanding and assessing different dimensions of the phenomenon under study?
3. Strengthen the credibility of the findings by combining quantitative and qualitative data?
4. Advocate for disempowered groups in society?
5. Rely on one methodology to guide the other in the study’s sampling, data collection or analysis?

Although both quantitative and qualitative methodologies are used together in mixed methods research, each method retains its distinctive role in the inquiry. O’Cathain, Murphy, and Nicholl (2007a) explain these roles in a pragmatic way (see Table 9.2).

**Table 9.1** Role of the mixed methods researcher

Collects and analyzes persuasively and rigorously both qualitative and quantitative data (based on research questions);
Mixes (or integrates or links) the two forms of data concurrently by combining them (or merging them), sequentially by having one build on the other, or embedding one within the other;
Gives priority to one or to both forms of data (in terms of what the research emphasizes);
Uses these procedures in a single study or in multiple phases of a program of study;
Frames these procedures within philosophical worldviews and theoretical lenses; and
Combines the procedures into specific research designs that direct the plan for conducting the study (Creswell & Plano Clark, 2011, p. 2)

**Table 9.2** Roles of different methods within a mixed method study

Stage	Components	Roles
1. Defining the research question		A qualitative method can generate a hypothesis for a quantitative method to test, establish the theoretical framework for the quantitative method, or help conceptualize the whole study
2. Address the range of research questions	Understanding how interventions work in the real world	A complex intervention may operate differently in practice from the original intention and qualitative research can address how an intervention is used in practice while quantitative research is used to measure outcomes. The strength of qualitative research to assess processes has been noted in social research
	Getting a range of perspectives	Qualitative research can help researchers to gain access to the views of participants while quantitative research allows researchers to explore their own agenda
3. Designing the study	Determining the sample	A quantitative method can facilitate the sampling strategy for a qualitative method; for example, a survey can distinguish representative from non-representative cases
	Improving the conduct of a method	When designing a trial, qualitative research may help to design appropriate recruitment strategies and information. This could be used for other quantitative methods such as surveys
	Designing study instruments	A qualitative method can help to design good survey instruments, and aid scale construction from them. In the context of evaluation, it can identify outcomes important to different stakeholders and include them within instruments
	Developing or optimizing interventions	When evaluating an intervention like a service, qualitative methods can help to develop the intervention develop an understanding of how the intervention works and who it might be most effective for, and indicate why the intervention has not worked
4. Analysis		The results from one method can affect the analysis of the other method, or qualitative and quantitative <i>data</i> can be combined for further understanding. For example, qualitative data can be 'quantitized', that is, numerically coded for analysis with the quantitative data

(continued)

**Table 9.2** (continued)

Stage	Components	Roles
5. Making use of the findings	Interpreting the findings	Each method can provide different aspects of a phenomenon. A qualitative method can explain factors underlying relationships in a quantitative study, confirm or contradict survey findings, interpret statistical relationships, explore puzzling responses or results, or offer case study illustrations. It may change the interpretation of findings, for example, urging that a treatment is not rejected as ineffective simply because it was not used, but finding a way of it being used so that it might be effective. In the context of evaluation, qualitative methods can describe the context in which the study operates, in particular what is going on with controls, thus aiding interpretation
	Determining generalizability	A quantitative method can help to generalize a qualitative study, for example a survey can situate the context of case studies
	Implementation	Qualitative methods can be used to consider the results of a study and their application within a real world context, drawing on pluralistic views of different stakeholders

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Recently, researchers have been conducting and writing articles that combine both quantitative and qualitative research methodologies within the same study. Such a merger of methodologies meets the criteria for the mixed methods research paradigm (Creswell & Tashakkori, 2007; Johnson & Onwuegbuzie, 2004). Creswell and Plano Clark (2011) recommend that readers examine numerous mixed methods research articles to determine how researchers use different methodologies (e.g., quantitative, qualitative) in their studies. An examination of published mixed methods research studies in journal articles can provide a better understanding of this methodology. The four examples below all have at least one quantitative methodology (intended to collect numbers) and one qualitative methodology (intended to collect words), where neither methodology is essentially connected to any specific inquiry paradigm (Greene, Caracelli, & Graham 1989).

- Example 1: Knaggs, Sondergeold, and Schardt (2015) examined how a college preparatory program contributed to college enrollment and perseverance, and students’ attitudes in the program. The researchers mixed quantitative and qualitative data. For the quantitative data, they used college data from the National Student Clearinghouse (NSC) database. For the qualitative data, they used focus group interview questions that were open-ended and semistructured.

- Example 2: McCrudden, Magliano, and Schraw (2010) examined how the relevance of instructions influenced readers' personal reading intentions, reading goals, text processing, and memory for text. They randomly assigned undergraduates to one of three pre-reading instructional conditions and then asked them to read for understanding. They used corresponding data sets. The quantitative data provided differences in reading time and recall while the qualitative data explained why the differences occurred.
- Example 3: Kallemeyn, Schiazza, Ryan, Peters, and Johnson (2013) examined how to engage history teachers in effective professional development. They described teachers' classroom practices in relation to (1) historical content and skills, (2) teachers' involvement in professional development, and (3) their schooling contexts. For the qualitative data, they integrated case studies and final interviews. For the quantitative data, they administered a survey. The data from the initial case study interviews provided information to develop survey items.
- Example 4: Hayden and Chiu (2015) examined the development of elementary preservice teachers' reflective practices as they solved problems that they encountered while teaching in a reading clinic. Using exploratory qualitative analysis they collected and analyzed the preservice teachers' written reflections to identify relationships among problem exploration, teaching adaptations, and problem resolution. Then they used confirmatory quantitative analysis to determine any significant relationships.

Note how these projects combined quantitative and qualitative methodologies to:

- Evaluate a strategy or program in practice (Onwuegbuzie & Leech, 2005)
- Examine social and behavioral processes that are difficult to study when using one type of methodology (either quantitative or qualitative) in isolation
- Integrate multiple perspectives and
- Address complex research questions

Effective combinations of qualitative and quantitative methodologies capitalizes on the strengths of each and offers better ways to address the research questions (Johnson, Onwuegbuzie, & Turner 2007).

**Online Tool** For an introduction to research designs that use both quantitative and qualitative approaches, check out the Research Rundowns blog, Mixed Methods Research Designs, posted at: <https://researchrundowns.wordpress.com/mixed/mixed-methods-research-designs/>.

## Approaches to Writing a Mixed Methods Research Study

If you elect to use mixed methods research, you will need to have a high tolerance for making complex decisions because a single, universally acceptable format for writing mixed methods research studies does not exist. The report can be written in multiple ways. Researchers write their study in a way that appropriately and effectively communicates their study to the intended audience. Essentially, “authors from a number of disciplines . . . consider how to present their work through a variety of forms and by choosing carefully the rhetorical devices that best elicit their intended meaning” (Ely, Vinz, Downing, & Anzul 1997, p. 55) such as narratives (e.g., vignettes, anecdotes), layered stories, pastiche (concurrently indicating several points of view), APA format, and others. The onus of responsibility is on the writer to persuade readers of the merits of the study (Sandelowski, 2003). A mixed methods research paper needs to include complete information about the study help researchers understand the procedures and results (Gliner, Morgan, & Leech 2009). However, researchers first need to understand the mixed methods research paradigm.

### Activity 9.1: Mixed Methods Research by Chronology

Think about a study you are considering or have conducted. Different mixed methods studies employ quantitative and qualitative approaches at different junctures in the research. For example, a researcher might begin by conducting exploratory interviews and, from those data, design a survey (qual first, then quan). Conversely, a researcher might analyze a large data set and then conduct focus group interviews to delve deeper into underlying reasons for responses (quan first, then qual). Or, a researcher may collect data concurrently, for instance, scoring a professional’s treatment plans for clients, observing them in a clinical setting, and interviewing both the clinicians and clients (quan and qual together). Which approach best suits the research questions that you have in mind?

The uniqueness of mixed methods research studies consists of the purpose of combining methods, establishing a priority for each methodology within a study, and the sequence in which each methodology is used including complementarity, confirmation, and development (O’Cathain, Murphy, & Nicholl 2008).

Before designing a study, researchers should carefully consider the “best” way to write their report to include all the necessary information within the context of the study. They need to use an approach that is creative and informative to maintain the readers’ interest and help them understand the study. The following sections describe one approach, but hopefully researchers will create their own approach and presentation style that best fit their mixed methods research studies and intended audiences (Leech, 2012).

**Table 9.3** Key components of a mixed methods research manuscript

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Although researchers need to consider the best way of presenting a mixed methods study they will, at least, need to:

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1. State the research question(s), both quantitative and qualitative
  2. Assess the appropriateness of using mixed methods research, given the purposes of the study
  3. Choose a specific mixed methods research design and supply the rationale for that choice
  4. Gather both quantitative and qualitative data
  5. Analyze the quantitative data with the appropriate statistical test and analyze the qualitative data using the most suitable qualitative analysis
  6. Interpret the data from a quantitative, qualitative, and blended perspective
  7. Legitimize the data by demonstrating how it simultaneously meets quantitative and qualitative criteria for quality
  8. Make conclusions that emanate from the insights afforded by the mixed method approach
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Based on Johnson & Onwuegbuzie (2004)

### Activity 9.2: Key Elements in a Mixed Methods Study

Using the basic components of mixed methods research in Table 9.3 as a guide, draft sections of a mixed methods research report. Use them as “building blocks” for a research article later on. If you have already begun a mixed methods paper, use these criteria to evaluate what you have written. Was there anything that you overlooked?

## Writing a Mixed Methods Research Report

Written reports of empirical studies need to be both warranted and transparent. Warranted means that enough evidence is reported to validate the findings and inferences that were presented. Transparent means that detailed information about the process of the study is described (American Educational Research Association (AERA), 2006). When writing about a mixed methods research study, researchers can use directions from numerous professional associations and books, including the American Psychological Association’s (APA, 2010) manual, the American Educational Research Association’s (AERA) two guides on conducting and reporting research (i.e., *Standards for Reporting on Empirical Social Science Research in AERA Publications* (AERA, 2006) and *Standards for Reporting on Humanities-Oriented Research in AERA Publications* (AERA, 2009), and the reporting standards from APA (APA Publications and Communications Board Working Group, 2008).

Writing the mixed methods research report presents many challenges. Although there are several approaches, one of the approaches is the standard APA (2010) format (Leech, 2012).

**Table 9.4** Standard APA (2010) format

Component	Content
Title	Tells the story that is found in the article in fewer than 10 words. The phrase mixed methods research may be integrated in the title
Abstract	Summarizes the study in approximately 250 words including the rationale (for study and use of mixed methods research), purpose, goals of the study, research questions, related scholarly work (e.g. theories and research studies), participants, data collection techniques, and interpretation
Introduction	Provides a foundation, a persuasive reason for the importance of the study, a review of the literature, and briefly describes the purpose, research questions (or problems), objective(s), research methodology, and the study’s contributions to the field
Methodology	Discusses the rationale for specific procedures such as selecting participants, research setting, and data sources (e.g., structured/unstructured interviews, standardized measures, questionnaires, observations, document analyses), and specific procedures for collecting both qualitative and quantitative data, validating hypothesized relationships, and selecting mixed methods research components, procedures, and processes
Data Analyses	Describes the methods of analyzing both qualitative and quantitative data in relation to the mixed methods research questions and the techniques that were used to analyze the data including statistical analyses, member checks, triangulation, and others
Results	Presents the results of the mixed methods research analyses using a framework that is based on both qualitative and quantitative data and justifies the supporting evidence
Discussion	Discusses the scientific information that was obtained from both qualitative and quantitative data and its impact on the area of study, mixed methods research questions, contributions to knowledge based on previous studies, and recommendations for research and practice
References	Assists in determining the significance of the theoretical framework that supports the process in the study. The selected journal will identify its required format style, which is usually the one recommended by the <i>Publication Manual of the American Psychological Association</i> (APA, 2010)

It organizes the report into the sections of: introduction, literature review, method, results, and discussion. The style in which empirical articles are written should be straightforward (Milardo, 2015). See Table 9.4 for a brief description of each component in this format.

**Online Tool** The National Institutes of Health (NIH) offer detailed guidelines for writing mixed methods research at [https://obssr.od.nih.gov/scientific\\_areas/methodology/mixed\\_methods\\_research/section2.aspx](https://obssr.od.nih.gov/scientific_areas/methodology/mixed_methods_research/section2.aspx).

According to Leech (2012), the standard APA (2010) format has a number of benefits.

- The obvious subdivisions help both researchers and readers to expect the information that is in each subdivision
- Both researchers and readers are used to this format.
- Most journals require this format.
- The standard APA (2010) format is to the point and is the most frequently used.

Drawing upon the mixed methods research writing framework (Leech, Onwuegbuzie, & Combs 2011) and standard APA (2010) format, the following sections provide some guidelines with examples on how to write a publishable mixed methods research report.

The title is the first text that is seen by and attracts the readers. For the writer, a precise title helps to bring closure to the manuscript. The words in the title must be carefully chosen to describe the content of the study; effective titles are clear, concise, informative, and relevant to the target audience (Annesley 2010a, b, c, d, e, f, g, h, i, j). Some mixed methods researchers include this phrase to indicate to readers that they used this research paradigm in their study. Here are two brief descriptions of mixed methods studies and their titles:

**Example 1:** Bernardi, Keim, and von der Lippe (2007) examined the social influence on family formation in eastern and western German young adults at an early stage of their family formation. They used a combination of qualitative and quantitative data collection and analyses.

**Title:** Social influences on fertility: A comparative mixed-methods study in Eastern and Western Germany

**Example 2:** Hayden and Chiu (2015) examined the development of elementary preservice teachers' reflective practices as they solved problems when they taught in a reading clinic. They collected and analyzed the teachers' written reflections to identify relationships among problem exploration, teaching adaptations, and problem resolution.

**Title:** Reflective teaching via a problem exploration–teaching adaptations–resolution cycle: A mixed methods study of preservice teachers' reflective notes

### **Activity 9.3: Writing the Title of a Mixed Methods Study**

Locate several examples of mixed-method study article titles. To find many examples quickly, look at the tables of contents for two journals that publish mixed methods research only: *Journal of Mixed Methods Research* and the *International Journal of Multiple Research Approaches*.

Most journals set a word limit of approximately 250 words for the abstract. The selected journal specifies its word count requirement in the authors' guidelines section. The Society for Research in Rehabilitation (no date) recommends the structure in Table 9.5.

**Table 9.5** Writing abstracts for mixed methods research

<b>Research question/objective and design:</b> state the research question/objective and its importance. Describe methodological or theoretical perspectives
<b>Sampling:</b> describe the participants and how they were selected
<b>Data collection:</b> describe data collection strategies (interviews, field notes, standardized tests) including what data were collected, from where, from whom, and by whom
<b>Data analyses:</b> describe the procedures used to analyze the qualitative and quantitative data including definitions of concepts, categories, and themes as well as how these were developed and relate to the data
<b>Quality of data and analysis:</b> describe the strategies that were used to improve the quality of the data analysis (e.g. triangulation, participants' validation) and validity (e.g. consider cases, alternative explanations, team analysis, peer review panels)
<b>Findings:</b> summarize important findings based on interpretation and theory
<b>Application of critical thinking to analysis:</b> consider the researchers' impact on data collected and analysis such as their critical method and position of data collected
<b>Theoretical and empirical context:</b> describe the evidence from the design and analysis that contribute to prior knowledge
<b>Conclusions:</b> support the conclusions based on data collected, interpretations, transferability to groups, participants, and settings beyond those studied

### Activity 9.4: Writing an Abstract for a Mixed Methods Study

Use Table 9.5 as an outline to generate a draft of an abstract for a mixed-methods study you have planned or would like to conduct. How did this structure help to direct your writing efforts? Now remove the headings and fashion it into a paragraph.

If you first follow an outline (Activity 9.4) and then fashion it into a paragraph, you can reread the revised abstract and continue to edit until the abstract is precise, flows, and stays within the word limit (Bondi & Sanz, 2014).

Keywords listed under the abstract are subject terms that help readers find articles that are related to their work. In identifying key words, researchers need to list those words that best describe their study. After they have a list of important keywords, they can examine their title and abstract to mesh these keywords with those in the title and abstract (Mack, 2012).

## Writing the Introduction

The introduction in a mixed methods research report begins with the importance of the study and the use of mixed methods. It can begin with some of the participants, the scene (i.e., where the research took place), and the plot (i.e., the main research question). Next it provides review of the literature and the problem statement, goals of the study, research objectives, rationale for use of the mixed methods, the research purpose(s), and the research questions (Leech, 2012).

Flecha's (2014) study of the Roma people (commonly referred to as Gypsies) illustrates beginning the study with a case drawn from the qualitative part of her study. The Roma are one of the most persecuted social groups in the world, and the historical background (quantitative) provides the context:

The Roma are the most important nonmigrant ethnic minority in Europe. They have historically been object of multiple discriminations that have damned them at the margins of society: slavery, expulsions, persecutions, Nazi genocide, and criminalization, among others. The European Union has already alerted that the Roma are one of the groups with highest risk of suffering poverty in Europe. (pp. 245–246)

Because Flecha (2014) has used qualitative approaches as well, she also describes the individual in considerable detail and narrows the gap between researcher and researched as is customary in qualitative research (Habermas 1984):

On December 6, 2011, Rafael, a Roma father of three, did not go to the school to coach the boys on his basketball team. Instead he was a speaker at the INCLUD-ED<sup>1</sup> Final Conference at the European Parliament. Rafael's life has changed profoundly in the last 5 years: he has left prison, overcome his drug addiction, and worked as a volunteer at the La Paz school. He is now a worker member of the recently created cooperative in the La Milagrosa neighborhood in Albacete, Spain. Speaking to an audience of policy makers, professionals, NGO representatives, researchers, and members of the Parliament, Rafael described how his involvement in the research project was the catalyst for all these changes. (p. 245)

## ***Review of the Related Literature***

The review of the literature is critical in conducting mixed methods research studies. In the literature review process, researchers rely on mixed methods research synthesis. This consists of “an interpretation of a selection of published and/or unpublished documents available from various sources on a specific topic that optimally involves summarization, analysis, evaluation, and synthesis of the documents” (Onwuegbuzie, Collins, Leech, Dellinger, & Jiao, 2007, p. 2).

As with literature reviews in qualitative and quantitative research, the purpose of is to inform the researcher about:

- What has been done and what needs to be done
- Which variables other researchers consider to be important to the topic
- What relationships exist between theory/concepts and practice
- Limitations of previous studies and ways to avoid duplicating them
- Which major research techniques and designs have been used thus far
- Contradictions and inconsistencies in the extant research literature
- Strengths and weaknesses of the different research techniques that have been used (Onwuegbuzie, Collins, Leech, Dellinger, & Jiao 2010).

A literature review helps to shape a well-defined theoretical/conceptual framework to guide the research process. In the following example, Arnon and Reichel (2009)

**Table 9.6** General purposes for mixed methods research

Prediction
Contribution to knowledge
Personal, social, institutional, and/or organizational influence
Degree of change
Understanding of complicated events
Experimentation with contemporary ideas
Creation of contemporary ideas
Communication of information to constituencies
Exploration of an earlier period

demonstrate how their review of the literature has shaped their conceptual framework and enabled them attain a high level of synthesis:

The “good teacher” is an idiomatic phrase, a prototypic concept of the desirable, ideal teacher that is expressed by many people. In fact, different people comprehend it differently and assert different characteristics for the good teacher. The image of the good teacher reflects people’s personal experience (Bannink & Van Dam, 2007) and the norms and values of their culture (Schwab, 1973).

In the portrait gallery of the ideal teacher, as designed by a long list of educational philosophers from ancient to postmodern times, we find variety in the images of teachers and their basic qualities and values. We note, for example, the teacher as midwife (Socrates), as an artist in the use of knowledge (Plato), as a role model (Aristotle), as a liberator (Freire), as an educator in accordance with nature (Rousseau), as an existentialist (Frankel), as a mediator (Feuerstein), as child centered (Neill), and as a postmodernist (Foucault) (Arnon & Reichel, 2007; Reichel & Arnon, 2005, p. 173).

As this example illustrates, the review of the literature is extensive, thorough, and current. The writer refers to primary sources that focus on the research problem (Boote & Beile, 2005). Some researchers believe that the purpose of the literature review may be slightly different for quantitative and qualitative methodologies. Technically, quantitative is a test of a theory whereas the very purpose of qualitative can be to allow a theory to “bubble up” from the data—for example, grounded theory. The commonality is that, both in quantitative and qualitative research, the findings from others’ studies are appropriately compared, contrasted, and related to the present study. When reviewing others’ research, writers assess their findings with respect to trustworthiness, credibility, dependability, legitimation, validity, plausibility, applicability, consistency, neutrality, reliability, objectivity, confirmability, and/or transferability (Leech & Onwuegbuzie, 2010; Onwuegbuzie, Leech, & Collins 2012). The review of the literature for a qualitative study requires you to assess findings for each empirical study in all three paradigms: qualitative, quantitative, or mixed methods research (Leech & Onwuegbuzie 2010). In addition, the review of the literature should provide a concise and logical description of the validity of inferences for each reported study to provide authenticity (Dellinger & Leech, 2007).

## Methodological Framework

The use of mixed methods research is justified by explaining why the study was conducted and what gap it will fill in the literature. The most common rationale for using mixed methods research is the need to completely understand the participants' experiences, a goal that would be unattainable with quantitative or qualitative methods alone. The rationale is explained based on the participant(s) or group(s), especially in relation to the historical, cultural, linguistic, social, and/or psychological composition of the sample members (AERA, 2006). Main rationales for mixing quantitative and qualitative methodologies consist of participant enrichment, instrument fidelity, treatment integrity, and significance enhancement (Collins, Onwuegbuzie, & Sutton, 2006). Mertens (2010) makes a case to use mixed methods research to understand communities and move toward redressing inequity in society. The rationale for a mixed method study is a reflection of its purposes, as outlined in Table 9.6.

Returning to Flecha's (2014) study of the Roma people, here is her rationale for using mixed methods research:

A mixed methods strategy has addressed this kind of refusal by the Roma and other groups and creates venues for active participation in the entire research process ... [this] makes it possible to include the voices of all social actors, especially those at the grassroots, who do not hold a university degree, and who have been traditionally excluded from the creation of scientific knowledge. (p. 246)

### Activity 9.5: Why Use the Third Research Paradigm?

Using the list in Table 9.6, decide which of the purposes of mixed methods research apply to a report you are planning to write. Now draft a brief rationale for using mixed methods.

Mixed methods researchers may identify two or more goals for each methodology—quantitative and qualitative (Leech & Onwuegbuzie, 2010; Newman, Ridenour, Newman, & De Marco 2003). Returning to Arnon and Reichel's (2009) study of "the good teacher," they identified the following four goals:

1. To demonstrate the use of a mixed method research design that is both explorative and confirmative by concurrently integrating qualitative and quantitative research strands.
2. To compare in the same research the simultaneous and equal use of open-ended questions, as a qualitative research tool, and closed questions, as a quantitative research tool for gathering data in a shared representative sample of a telephone survey.
3. To display a conversion in the qualitative strand from verbal data analysis to quantitative data and its statistical analysis.
4. To infer research conclusions from the integrated mixed model research design. (p. 172)

Generally, research questions indicate the problem that the researchers are studying. Explicitly, research questions are probing statements that are “an extension of the statement of the purpose of the study in that it specifies exactly the question that the researcher will attempt to answer” (Johnson & Christensen, 2004, p. 77). Research questions are developed based on theories, past research, previous experience, or practice. Questions offer a framework to guide researchers as they: conduct the study, systematize it, show its importance, and strive for continuity throughout the research process. Research questions also set the limits of the study and explain its boundaries (Onwuegbuzie & Leech, 2006).

Research questions provide critical guidelines in mixed methods research. They need to be interactive, emergent, fluid, and evolving. According to Onwuegbuzie and Leech (2006), “mixed methods research questions combine or mix both the quantitative and qualitative research questions. Moreover, a mixed methods research question necessitates that both quantitative data and qualitative data be collected and analyzed” (p. 483). A study of doctoral students’ experience with reading research articles, for example, identified research questions and categorized them according to the research paradigm:

### **Quantitative research questions**

1. What is the level of reading comprehension among doctoral students?
2. What is the level of reading vocabulary among doctoral students?

### **Qualitative research question**

3. What are the perceived barriers to reading empirical articles of doctoral students?

### **Mixed methods research questions**

4. What is the prevalence of each of the perceived barriers to reading empirical articles of doctoral students?
5. How do these perceived barriers to reading empirical articles relate to one another?
6. What is the relationship between reading ability (i.e., reading comprehension, reading vocabulary) and perceived barriers to reading empirical articles of doctoral students?
7. Which perceived barriers predict the levels of perceived difficulty doctoral students experience in reading empirical research articles? (Benge, Onwuegbuzie, Mallette, & Burgess 2010, p. 59)

### **Activity 9.6: Writing Research Questions**

Using the examples above, try to write at least one quantitative research question, one qualitative research question, and two to three mixed methods research questions for a study that you plan to conduct.

## Writing the Methodology Section in Mixed Methods Research

The methodology section provides enough information to understand how the study was conducted. It includes how the participants, data collection techniques, and data analysis were selected and used. Such information helps researchers enhance the credibility, validity, and readability of the study.

The participants and the rationale for their selection need to be described in detail to establish the credibility and validity of the study. For example, it is important to let readers know who the participants were, where they live, how many participated, and any other relevant information. A description should also be provided about the initial and final sample sizes for both the qualitative and quantitative portions of the study (Leech, 2012). Here is an example of how to write the descriptions of participants and settings:

### Participants

Participants were 912 college students who were attending a midsize public university in a midsouthern state. The sample size represented 10.66% of the student body at the university where the study took place. These students were enrolled in 68 degree programs (e.g., education, mathematics, history, sociology, dietetics, journalism, nursing, prepharmacy, premedical) that represented all six colleges. The sample was selected purposively utilizing a criterion sampling scheme... The majority of the sample was female (74.3%). With respect to ethnicity, the respondents comprised Caucasian American (85.4%), African American (11.0%), Asian American (1.0%), Hispanic (0.4%), Native American (0.9%), and other (1.3%). Ages ranged from 18 to 58 years ( $M=23.00$ ,  $SD=6.26$ ). With regard to level of student (i.e., undergraduate vs. graduate), 77.04% represented undergraduate students. A total of 76 students were preservice teachers. (Onwuegbuzie, Witcher, Collins, Filer, Wiedmaier, & Moore 2007, p. 123)

### Setting

The university where the study took place was established in 1907 as a public (state-funded) university. Containing 38 major buildings on its 262-acre campus, this university serves approximately 9,000 students annually (8,555 students were enrolled at the university at the time the study took place), of whom approximately 1,000 are graduate students. The university's departments and programs are organized into six academic colleges and an honors college that offers an array of undergraduate and master's-level programs as well as select doctoral degrees. The university employs more than 350 full-time instructional faculty. It is classified by the Carnegie Foundation as a Masters Colleges and Universities I, and it continues to train a significant percentage of the state's schoolteachers. (Onwuegbuzie, Witcher, Collins, Filer, Wiedmaier, & Moore 2007, pp. 123–124)

### Activity 9.7: Writing the Description of the Participants and the Setting

Make a list of relevant details about the participants and the setting for the study you have in mind. Then, using the preceding examples, draft that section of a mixed methods research report.

During the last decade, a surplus of mixed methods research designs have emerged. Novice and experienced researchers encounter the challenge of finding and selecting the best possible mixed methods research design for their study. When describing the design, be certain to include: (a) the framework, (b) the rationale for choosing it, and (c) any discrepancies between the chosen design and those used by

other researchers. As you write about the design, give attention to the quantitative and qualitative aspects, the specific design used for experimental and quasi-experimental research, and the precise disposition of the research designs (Leech & Onwuegbuzie, 2010). Here is a sample description:

The mixed-methods research design used in this investigation could be classified as a fully mixed sequential dominant status design. This design involves mixing qualitative and quantitative approaches within one or more of, or across, the stages of the research process. In this study, the qualitative and quantitative approaches were mixed within the data analysis and data interpretation stages, with the qualitative and quantitative phases occurring sequentially and the qualitative phase given more weight. (Onwuegbuzie, Witcher, Collins, Filer, Wiedmaier, & Moore 2007, p. 125)

## **Writing the Data Collection Section in Mixed Methods Research**

As with other forms of empirical research, the data collected in a mixed methods study address the research questions or hypotheses. The data collection process should correspond to the mixed methods research design in the study. This means that researchers synchronize their procedures where both quantitative and qualitative data are collected simultaneously or chronologically where one kind of data are collected and analyzed before the second data collection. For both the qualitative and quantitative methodologies, researchers need to select and provide detailed descriptions of all data collection instruments, such as developer of the instruments (with appropriate citations); format of the instruments; when, how, and why they were administered; the context and focus of data collection; the duration of data collection; and information about the quality of the data collected such as score reliability, score validity, and interrater reliability (Leech & Onwuegbuzie, 2010). Here is a description of data collection for the mixed methods study of doctoral students' reading challenges with empirical research articles.

In the first class session, all participants were administered the following two instruments: the Nelson-Denny Reading Test (NDRT) and the Reading Interest Survey (RIS). The NDRT, developed by Brown, Fishco, and Hanna (1993), was used to measure reading ability. This instrument, which is appropriate for Grades 9 to 16, college students, and adults, is a 118-item test containing two subtests: Vocabulary (80 items) and Comprehension (38 items). Each item on the NDRT contains a five-choice response option. This test was selected because of its widespread use among researchers, adequate score reliability, and score validity that have been reported in the literature, as well as the fact that normative data are available on very large samples of high school and college students (Brown et al., 1993). For the present investigation, both the reading vocabulary scores and reading comprehension scores were analyzed. Score reliability (i.e., KR-20) was .85 (95 % confidence interval [CI]= .82, .88) for the reading vocabulary subtest and .69 (95 % CI= .63, .75) for the comprehension subtest. The RIS contains 62 open- and closed-ended items; therefore, the mixed data collection style used in the present study could be referred to as Type 2 data. (Burgess, Bengue, Onwuegbuzie, & Mallette 2012, p. 12)

## ***Mixed Methods Research Data Analyses***

Simultaneously to the data collection, data are analyzed to merge the findings for triangulation; to validate quantitative data through qualitative data for triangulation; to convert the data for comparison; or to construct data that will focus on other kinds of questions than the initial ones (Creswell & Plano Clark, 2011). Mixed methods research depends on the analyses and interpretations of both qualitative and quantitative data. The use of both methodologies enhances the researchers' interpretations of significant findings when researchers make a parallel analysis (Onwuegbuzie & Leech, 2006). Exemplary mixed methods research yields a "synergy of both [qualitative and quantitative approaches] allows for a comprehensive analysis that can balance a persuasive, generalizable analysis with nuance and complexity" (Jacobs, 2003, p. 14).

In mixed methods research, researchers choose those techniques that correspond to the study's purposes and combine the data at one or more stages of data analysis (Parylo, 2012). The quantitative data are analyzed using quantitative methods, while the qualitative data are analyzed using qualitative methods (Creswell & Plano Clark, 2011). As mentioned previously in this chapter, data analysis can occur at different stages in the sequence. For instance, researchers can first analyze their qualitative data and then conduct a quantitative analysis using the themes and codes from the qualitative analysis. The transformation of qualitative data into quantitative data can be accomplished using sophisticated tools, such as factor analysis. Conversely, researchers can first analyze their quantitative data and then conduct a qualitative analysis, for example, developing a narrative profile based on a set of test scores or subscale scores that represent a domain (Onwuegbuzie & Combs 2011). Here is a description of the data analyses for a mixed method study: that were used by the researchers:

*Concurrent analysis* of qualitative and quantitative data, or "parallel mixed analysis" or "triangulation of data sources"—to mention some of the terms found in the literature. The use of two methods of questioning could contribute to cross-validation of qualities attributed to the ideal teacher (triangulation). At this stage, we analyzed the quantitative and qualitative data separately and concurrently

*Sequential analysis* of the qualitative data—first by qualitative content analysis to obtain its categories, and then by quantizing techniques. After converting the qualitative categorical data into numerical binary codes, we analyzed them statistically. (Arnon & Reichel, 2009, p. 182)

## **Writing the Results Section of a Mixed Methods Study**

Based on the research questions, the study's significant findings are clearly discussed in the mixed methods research report (Leech & Onwuegbuzie, 2011). Interpretation in qualitative research should focus on searching for insights into what makes a real difference in the participants' quality of life or those with whom

they interact, including statistically significant effects (Onwuegbuzie & Leech, 2007). For example, here is a synopsis of how Parylo and Zepeda (2014) interpreted their findings:

In a study that examined how district leaders of two school systems depict an effective principal, Parylo and Zepeda (2014) conducted a membership categorization analysis and found that district leaders believed that an effective principal had (1) a track record of being a good manager, (2) instructional skills, (3) interpersonal skills that included being a team player and community leader, and (4) perceptual characteristics. The researchers used these findings to construct a graphical model portraying an 'effective principal' from the point of view of district leaders. They also offered implications for policy, research, practice, and leader preparation.

## Writing the Discussion

The discussion section might include summarizing the findings, arriving to some conclusions, validating/legitimizing the data interpretations, and reformulating the research question(s) to guide researchers with future studies.

After summarizing the findings, researchers arrive at some conclusions. For example, in the study of doctoral students' reading of empirical research described earlier, Benge and colleagues (2010) concluded that

reading ability likely plays an important role in the learning context. Moreover, the negative relationship between levels of reading ability and some of the emergent themes and meta-themes suggests that inadequate reading ability can place a student at risk of not learning the skills necessary to be a consumer of research...by not reading key empirical articles. As such, interventions aimed at improving reading ability among doctoral students likely might help to address their research needs. (p. 71)

## Validity Issues in Mixed Methods Research

All research findings are exposed to threats of descriptive validity (accuracy of explanations), interpretive validity (researchers' interpretations of the participants' behavior), internal validity (instrumentation), and external validity (Campbell, 1957; Onwuegbuzie, 2003).

Both the quantitative and qualitative data need to be assessed for data validation/legitimation. Legitimation is the trustworthiness, credibility, dependability, confirmability, and/or transferability of the researchers' inferences (Onwuegbuzie & Leech, 2007; Leech & Onwuegbuzie, 2011). Lack of legitimation "means that the extent to which the data have been captured has not been adequately assessed, or that any such assessment has not provided support for legitimation" (Onwuegbuzie & Leech, 2004, p. 778).

For qualitative data a detailed description of any threats to trustworthiness, credibility, dependability, authenticity, verification, plausibility, applicability,

confirmability, and/or transferability of data (Creswell 2013a, b; Miles, Huberman, & Saldaña 2013) needs to be provided. All verification procedures used need to be discussed. The overall mixed methods research need to have an in-depth discussion of legitimation concerning the quantitative and qualitative analyses. Returning to the study of doctoral students and challenges they faced in reading research, the authors provided this discussion of threats to validity and legitimization of their approach:

*Validity of findings from quantitative phase.* Threats both to internal validity and external validity prevailed with respect to the quantitative findings (Campbell, 1957; Campbell & Stanley, 1963, 1966). The biggest threat to the internal validity of the quantitative findings was instrumentation because of the relatively low reliability coefficient (i.e., .69) pertaining to the reading comprehension scores, which can affect statistical power (Onwuegbuzie & Daniel, 2004).

With regard to external validity, because the sample represented doctoral students at a single university (i.e., threat to population validity and ecological validity) from whom data were collected at a single point in time (i.e., threat to temporal validity), it is not clear the extent to which the present findings generalize beyond the sample to doctoral students from other institutions in other regions of the United States and beyond.

*Legitimation of findings from qualitative phase.* The biggest threats to the qualitative findings were descriptive validity (i.e., factual accuracy of the reasons provided by the doctoral students) and interpretive validity (i.e., the extent to which a researcher's interpretation of the reasons provided represents an understanding of the students' perspectives and the meanings that they attach to their words and actions)... However, descriptive validity and interpretive validity were enhanced by member checking ... all the themes secured endorsement rates that yielded at least small-to-medium effect sizes suggests that data saturation took place.

*Legitimation from the mixed research phase.* It can be seen that nine threats were addressed to some degree. Nevertheless, despite the extremely rigorous nature of the mixed research design, replications of this inquiry are needed to assess the reliability of the current findings. (Burgess, Bengé, Onwuegbuzie, and Mallette 2012, pp. 23–24)

A part of mixed methods research that is sometimes surprising to authors is reformulating the research questions. Based on the results, the goal, objective, rationale, purpose, and research questions are examined to propose new research questions. The mixed methods research report needs to explain how the research questions can be reformulated. Reformulating all research procedures leads to recommendations for future research that will conclude in a validation, replication, or expansion of the study (Leech, 2012; Leech & Onwuegbuzie, 2011). To illustrate, Burgess, Bengé, Onwuegbuzie, and Mallette's (2012) study found five themes that described doctoral students' reasons for reading research articles. In addition, a series of canonical correlation analyses showed relationships between reasons for reading empirical articles and (a) reading intensity (i.e., frequency of reading empirical research articles, number of empirical research articles read each month) and (b) reading ability (i.e., reading comprehension, reading vocabulary). Based on these findings, Burgess, Bengé, Onwuegbuzie, and Mallette (2012) reformulated

the mixed methods research question for researchers to use in the future: *What is the relationship between doctoral students' reasons for reading empirical literature and their perceived barriers to reading empirical literature?* (p. 28)

## Evaluating the Quality of Mixed Methods Research Reports

Researchers have described the importance of mixed methods research and have increased their publication of mixed methods research studies. Creswell, Fetters, and Ivankova (2004) identified issues that researchers can consider when designing a mixed methods research study while general criteria have been established for planning, designing, reporting and assessing mixed methods research studies (Creswell & Plano Clark, 2011; O’Cathain et al., 2008). Several researchers and organizations have published guidelines on how to review quantitative and qualitative studies, but specific guidelines are needed with mixed methods research (O’Cathain et al., 2008). It is critical that researchers have a refined set of criteria to evaluate the quality of their reporting in mixed methods research studies. O’Cathain and colleagues, (2008) recommend several guidelines to use in reporting a high quality mixed methods study. Table 9.7 provides guidelines to assess designs and inferences made in reports of mixed methods research studies, while Activity 9.8 provides guidelines on evaluating a mixed methods research report.

### Activity 9.8: Critiquing a Mixed Methods Manuscript

Use the following questions to review a mixed methods study that is published or as a tool for self-assessment of a study you are drafting. Did the researcher describe: (1) the justification for using a mixed methods approach to the research question? (2) the design in terms of the purpose, priority and sequence of methods? (3) both the quantitative and the qualitative methods in terms of sampling, data collection and analysis? (4) where integration has occurred, how has it occurred and who has participated in it? (5) any limitation of one method associated with the presence of the other method? and (6) any insights gained from mixing or integrating methods? (O’Cathain et al., 2008, p. 97).

**Table 9.7** Checklist to assess a mixed methods research manuscript

1. Is the use of mixed methods research justified?
2. Is the design for mixing methods described?
3. Is the design clearly communicated?
4. Is the design appropriate for addressing the research questions?
5. Has rigor of the design been considered (proposal) or adhered to (report)?
<b>Assessment of the inferences made in reports of mixed methods studies</b>
1. Is there clarity about which results have emerged from which methods?
2. Are inferences appropriate?
3. Are the results of all the methods considered sufficiently in the interpretation? (O’Cathain et al., 2008, p. 95)

**Table 9.8** Journals that publish mixed methods research

Some examples of journals that publish mixed methods research are:
<i>American Behavioral Scientist</i>
<i>American Journal of Education</i>
<i>Educational Evaluation and Policy Analysis</i>
<i>Educational Researcher</i>
<i>Evaluation and Research in Education</i>
<i>International Journal of Multiple Research Approaches</i>
<i>International Journal of Qualitative Methods</i>
<i>International Journal of Research in Education Methodology</i>
<i>International Journal of Social Research Methodology: Theory and Practice</i>
<i>Journal of Counseling and Development</i>
<i>Journal of Mixed Methods Research</i>
<i>Quality and Quantity: International Journal of Methodology</i>
<i>School Psychology Quarterly</i>
<i>The Journal of Effective Teaching</i>
<i>The Qualitative Report</i>

## Mixed Methods Research Journals

More mixed methods research procedures are being used in research studies, which has prompted research journals to recognize this third paradigm and for the founding of new research journals that focus on mixed methods research to emerge. Presently, an abundant number of journals are accepting and publishing mixed methods research studies. The increased recognition is evident in the websites, conferences, and workshops that focus on this type of methodology. Table 9.8 suggests some outlets for mixed methods research articles.

## Conclusion

In work with living things, hybridization is a major mechanism for reducing flaws and producing hardier stock. Plants, for example, are cross-pollinated in the hopes of capturing the best attributes of each. New plants are produced that have greater resistance to pests or diseases, resilience under different growing conditions, or higher crop yields per acre. However, there are no guarantees. Some of the anticipated goals may not be achieved and the hybrid plant could turn out to have other, more serious limitations. Mixed methods research has similar risks and rewards. Ideally, it propels the field forward but it also can become mired in complexity and fail to deliver on its promise. Without a doubt, blending the two research paradigms requires a research skills, high level conceptualization and strength in scholarly writing.

At its best, mixed methods research is an intellectual and practical combination of qualitative and quantitative methodologies that is designed to address complex research questions more extensively and more completely (Morse, 2010). This third research paradigm aims high and attempts to generate “the most informative, complete, balanced, and useful research results” (Johnson, Onwuegbuzie, & Turner 2007, p. 129). A mixed methods research study can lead to insights that cannot be obtained from a qualitative or quantitative research alone (O’Cathain, Murphy, & Nicholl 2007a, 2007b). Above all, mixed methods researchers need to generate a well-written report that reflects “the highest standards of ethical practice both with respect to human participation and with respect to the execution of professional conduct and judgment in research” (AERA, 2006, p. 39).