

Describing Mixed Methods Research: An Alternative to Typologies

Journal of Mixed Methods Research
7(2) 141–151
© The Author(s) 2012
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1558689812461179
mmr.sagepub.com


Greg Guest¹

Abstract

Scholars have created a variety of typologies to describe and simplify mixed methods research designs. In this article, I review the rationale for using these typologies and discuss some shortcomings of the existing methods of classification. I argue that current systems of classification, although useful for simple and less fluid types of mixed methods research, are not capable of capturing the complexity and iterative nature of larger, more intricate research projects. I suggest an alternative way of viewing and describing mixed methods research for studies that resist simple classification. This alternative perspective shifts the unit of reference to the *point of interface*—where QUAL and QUAN data are integrated—and reduces the number of descriptive dimensions to two—the *timing* and the *purpose* of data integration.

Keywords

typology, mixed methods, mixed methods designs, research design

Since the formal field of mixed methods was established in the late 1980s, researchers have created a variety of typologies to describe and classify mixed methods research designs (Creswell & Plano Clark, 2007, 2011; Greene, 2007; Greene, Caracelli, & Graham, 1989; R. Johnson & Onwuegbuzie, 2004; Morgan, 1998; Morse, 1991; Morse & Niehaus, 2009; Teddlie & Tashakkori, 2009). Typologies are designed to impose order and simplify complex phenomena for didactic, organizational, and communicative purposes. Categories within a typology must be broad enough to simplify the phenomena being classified, but not so broad as to be vague and uninformative. Conversely, the differentiating features of a typology cannot be so narrow as to create a multitude of unique categories, and thus negate the original purpose of simplification. Systems of classification must also create categories that reflect and summarize real-world phenomena.

With these criteria in mind, I review the rationale for using typologies in the field of mixed methods and discuss some shortcomings of the existing methods of classification. I suggest a different perspective—one that shifts the unit of reference to the *point of interface* and reduces the number of descriptive dimensions. This is not a new typology, but rather an alternative way to describe mixed methods designs when existing typologies do not work.

¹FHI 360, Durham, NC, USA

Corresponding Author:

Greg Guest, FHI 360, 2224 E NC Highway 54, Durham, NC 27713, USA.
Email: gguest@fhi360.org

Revisiting the Purpose of Mixed Methods Typologies

Typologies can facilitate the explanation of complex concepts, guide practice (Plano Clark & Creswell, 2008), and legitimize fields of study. But as the philosopher John Stuart Mill (1865/2008) observed, “the merits of a classification depend on the purposes to which it is instrumental” (p. 34). So what are the purposes of mixed methods typologies? Teddlie and Tashakkori (2009) are among the few scholars who explicitly outline the rationale for typologies in the mixed methods field. They suggest five reasons why so much effort has been dedicated to classifying and reclassifying mixed methods designs. Below I summarize those reasons and comment on the degree to which they have been vindicated.

Reason 1: Typologies Are Tools That Help Researchers Design Their Studies

Typologies can help novice researchers understand how different methods can be combined. By providing a conceptual framework, a typology can give newcomers a sense of confidence when they plan their research. (The apparent logic of this rationale is that if the approach has a name it must be credible. I have observed this in practice while teaching.)

Experienced researchers usually have a different view. Researchers in various disciplines were integrating qualitative and quantitative methods long before the field of mixed methods formally emerged and typologies were established. John Snow’s research on the cholera epidemics that plagued London in the late 19th century is a classic example. Snow used multiple qualitative and quantitative methods to identify the infamous Broad Street pump handle as the source of the epidemics (S. Johnson, 2006). Similarly, anthropologists have been integrating qualitative and quantitative methods in ethnographic research for more than a century. And, social scientists were using qualitative methods to inform structured surveys decades before the emergence of mixed methods as a scholarly field. The same can be said for many of the mixed methods rapid assessment toolkits that came out of agricultural development in the 1980s (Chambers, 1994). The majority of data transformation techniques—such as epidemic curves and social network diagrams (which are qualitative renderings of quantitative data) or the quantification of qualitative data such as theme frequencies or cultural domain analyses (Romney & Weller, 1988)—also predate the formal era of mixed methods. Many other examples can be cited.

Some sophisticated techniques for data mixing and integration (e.g., A. Bryman, personal communication, July, 2010; Plano Clark, Garrett, & Leslie-Pelecky, 2010) have advanced the thinking of experienced researchers and have provided enhanced methods for data integration, but the same cannot be said for typologies. The point is that long (possibly centuries) before the term *mixed methods* was introduced, researchers from a host of disciplines were integrating quantitative and qualitative approaches.

Reason 2: Typologies Establish a Common Language for the Field

Mixed methods typologies may have created a common language, but as Teddlie and Tashakkori (2009) acknowledge, there is more disparity than agreement between typologies and their constituent nomenclature. Mixed methods scholars do not even agree on the definition of “mixed methods research.” Morse and Niehaus (2009), for example, counter the prevailing trend by arguing that the integration of two techniques from the same approach (e.g., QUAL/QUAL or QUAN/QUAN) should be considered as mixed methods. In contrast to most mixed methods scholars, the same authors also argue that using qualitative research to inform a survey instrument should not be considered a mixed methods design; they contend that this is part of the standard procedure for survey development.

The use of various terms to denote design types or the components within a design also creates a confusing linguistic situation. A recent count identified at least 15 published mixed methods typologies (see Creswell & Plano Clark, 2011), each with its own definitions and terms. This situation might change as the field matures. If so, a common language would benefit the discipline. At the moment, though, there is more divergence than convergence.

Reason 3: Typologies Provide Structure to the Field

Typologies inherently provide structure. But we need to ask, is that structure useful? Existing typologies often fail to accurately represent the activities of researchers. One problem is that the categories within a typology are not always clearly demarcated. At what point, for example, does an embedded design become an exploratory qual → QUAN design? Similarly, typologies often blur the temporal distinctions between stages of the research process when referring to the timing of data integration. Does the point of integration refer to data collection, data analysis, data interpretation, or some combination thereof?

Consider the following example from one of the author's mixed methods studies (see Figure 1). If one emphasizes the data collection process, the study would be regarded as an "exploratory sequential design" (Creswell & Plano Clark, 2011) because information from qualitative data sets inform the survey design and the sampling procedures. If one emphasizes the data analysis, however, the study would be deemed a "convergent concurrent design" (Creswell & Plano Clark, 2011) because three data sets are analyzed separately and mixed in the interpretation stage.

Certainly many mixed methods studies are uncomplicated. They might be composed of two clearly defined data sets that are integrated in a straightforward manner. In such cases, the majority of existing typologies work well. But the complexity and fluidity of many contemporary research studies can further confuse the indistinct borders of a typology. These studies resist simple classification. This is the most common critique I hear when providing (or attending) mixed methods workshops. Larger mixed methods studies often include more than one analysis and can generate several unique reports.

Furthermore, researchers often mix and match different data sets—or even parts of data sets (e.g., specific questions or subsamples)—within a single study in various ways. In one of my studies, for example, data generated from the same focus-group *instrument* were intentionally used for four distinct purposes: (1) to corroborate and expand on previously collected data, (2) to inform the content of the subsequent survey, (3) to help explain the survey's findings, and (4) as stand-alone exploratory qualitative data to inform another research proposal. This was achieved by dividing the instrument into several domains of inquiry, each reflecting a particular objective.

Part of the data analysis for this study also included data conversion techniques (such as the calculation of theme frequencies) and involved two different levels of analysis. So based on a *single instrument alone* (which was one among many in this study), existing typologies could classify the study in several ways: *explanatory sequential* (Purpose 1, Purpose 3 above), *exploratory sequential* (Purpose 2), *advocacy* (Purpose 4), *monomethod* (Purpose 4), *conversion* (quantitizing themes), and *multilevel* (integrating two levels of analysis).

Reason 4: Typologies Help Legitimize the Field

Tackling a research problem by collecting several types of data from different sources is generally accepted as good practice that enhances a study's validity. However, researchers often have biased opinions about the relative merits of qualitative and quantitative approaches. As the field

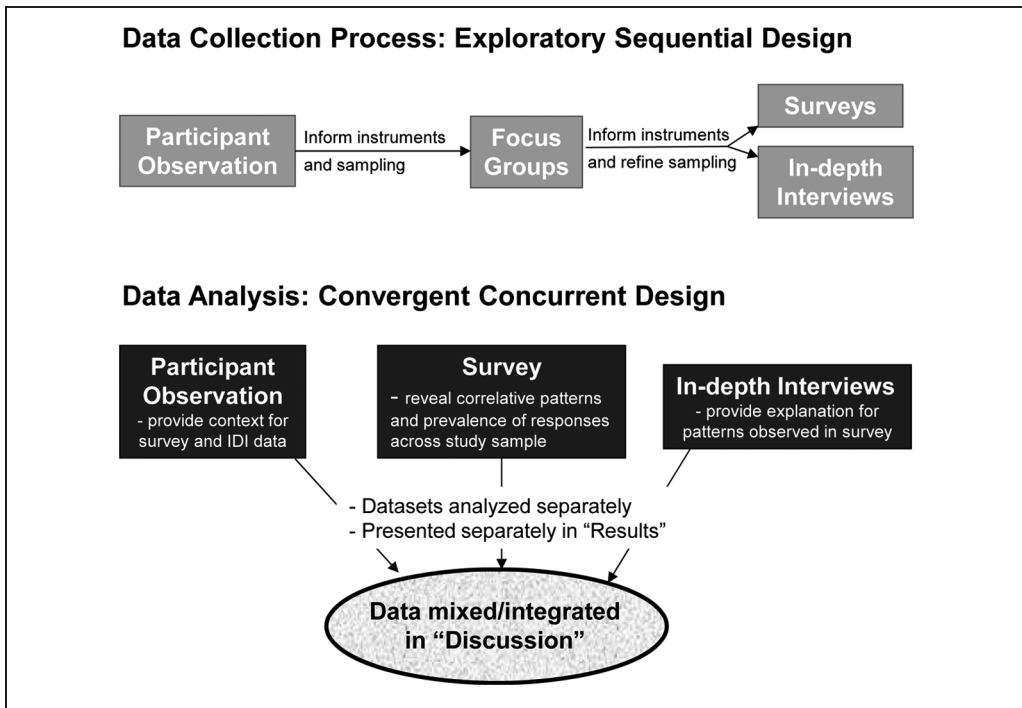


Figure 1. An example of two “designs” in one study.

of mixed methods expands, such biases may be tempered as detractors recognize that each approach has its virtues in certain contexts. Could typologies encourage this process? That remains to be seen. What is certain is that journals in a variety of disciplines regularly publish mixed methods articles that do not explicitly mention “mixed methods” or refer to a typology. In sum, a study gains legitimacy from the strength of the research design, the use of a cogent argument, and the transparency of the research process.

Even so, the explicit use of the term *mixed methods* has grown substantially over the past decade. In 2000, the PubMed database contained zero articles with “mixed methods” in the title. By 2005, this number had grown to 45 (0.0065% of all articles catalogued), and to 103 (0.0112% of all articles) by 2010, representing nearly a twofold increase in a 5-year period. The role of typologies in this trend is uncertain, however.

The formal field of mixed methods is expanding in other ways as well. Some funding organizations are developing specific standards for reviewing mixed methods research (e.g., Creswell, Klassen, Plano Clark, & Clegg Smith, 2011). The standards, however, do not explicitly refer to typologies. Rather, the recommendations focus on good research design, the justification of a mixed methods design, and the appropriate use of sampling strategies, data collection methods, and analytic procedures.

Reason 5: Typologies Are Useful Pedagogical Tools

One of the most common queries I hear as an instructor of mixed methods is to provide recommendations for an introductory text. For the majority of methodological subjects I can readily recommend a good foundational book for a particular method. This is not the case with mixed

methods. Given the wide array of typologies and terminology, I resort to telling students—and I have heard other instructors do the same—that they should review a variety of mixed methods books to understand the many different perspectives. Although this approach familiarizes readers with the breadth of the viewpoints, it is not the most efficient introduction to the field. With dozens of mixed methods textbooks to choose from it becomes a daunting task that may generate more confusion than comprehension.

Recent Typological Modifications

Some of the issues described above are not novel concepts. Maxwell and Loomis (2003) recognized that “the actual diversity in mixed methods is far greater than any typology can adequately encompass” (p. 244). Tashakkori and Teddlie (2003) came to a similar conclusion, noting that it is not possible for any one typology to be exhaustive.

One of the trends in typological development has been the creation of new typologies and the synthesis and expansion of existing ones. Natasi, Hitchcock, and Brown (2010) provide an example of this path. They argue that the “continued wrestling with mixed methods typologies [is] a useful endeavor, even if the issue remains problematic” (p. 306). The authors summarize existing typologies based on nine criteria. They synthesize these criteria to create a new, inclusive framework, which they refer to as “synergistic partnership-based fully integrated mixed methods research” (p. 322). The framework “builds on existing design typologies,” and contains the following key elements: researcher/stakeholder collaboration and synergism, the cyclical and iterative nature of the research process, and relevance to real-world research (Natasi et al., 2010, p. 329).

The framework proposed by Natasi and colleagues is highly inclusive and can capture much of the complexity embodied in mixed methods research. It is limited, however, in its ability to classify. By the authors’ own characterization, the framework is not a typology, but is rather “an attempt to integrate the body of work that has come before us into an inclusive framework that can help researchers identify a typology that suits their needs and proceed accordingly with the study design” (Natasi et al., 2010, p. 307). In other words, it is a tool to help researchers choose a typology that best fits their particular research.

On the other end of the spectrum, some scholars have worked toward summarizing key typological dimensions in an attempt to create simpler, yet inclusive, typologies. Leech and Onwuegbuzie (2009) present a three-dimensional framework in which they distill mixed methods research designs down to three fundamental dimensions: (a) *level of mixing* (partially vs. fully mixed), (b) *time orientation* (concurrent vs. sequential), and (c) *emphasis of approaches* (equal status vs. dominant status). The resulting typology comprises eight basic design types, based on the eight permutations generated from the three dimensions they identify.

The move toward simplification is laudable and the typology developed by Leech and Onwuegbuzie (2009) is an important contribution. Their eight-design typology reduces much of the confusion surrounding the vague boundaries between designs that is typical of other typologies. The terms they use are intuitive and do simplify the classification process. Like its predecessors, however, the model is unable to capture more than one type of design in a single study; nor does it consider the fluid, complex nature of large research projects. One would be hard-pressed to fit the research examples described above into this (or any single) typology.

Shifting the Focus: From Study to Points of Interface

A typology needs to capture the majority of variability expressed across the universe of real-world cases (research scenarios) it represents, yet simultaneously simplify that variability. In the case of mixed methods research this prospect faces the problems discussed above. Is there an alternative to typologies?

One approach is to use an alternative unit of reference to describe mixed methods research. In current discussions of research “designs” the unit of reference is an entire research study or program. Typological references embody this form as well. For example, when mixed methods scholars mention an *exploratory sequential design*, a *conversion design*, or a *partially mixed, concurrent, equal status design*, the term *design* refers to a complete research study. This conceptual and linguistic convention is responsible for some of the problems noted above because it forces researchers to fit an entire study design into an inadequate classification system.

Let me propose a shift in focus from the entire study to the *point of interface* between two data sets. The point of interface refers to any point in a study where two or more data sets are mixed or connected in some way. Such intricate studies could simply be described as “mixed methods research” containing, for example, “three sequential phases,” or “multiple points of interface.” This linguistic shift alone would eliminate the painstaking process of trying to describe an entire study with inappropriate terminology and it would provide an alternative way to describe the inherent complexity and fluidity of many mixed methods studies. Note that the details of the design would not be lost; they would simply be presented in the methods section of the report or proposal, as they would with any study.

A detailed description in the methods section for any complex study should include a visual representation of the research process. Diagramming is critical for the accurate and cogent description of complex study designs. Ivankova, Creswell, and Stick (2006) outlined useful procedures for the graphic depiction of research designs. Illustrating the *where*, *how*, and *why* data sets are connected and mixed—characterizing the points of interface—is a particularly important component of this process.

Shifting the focus from the overall study design to the points of interface within a study would also shed light on the boundaries between the data collection, analysis, and presentation stages of the research process because the unit of reference is more precise. Each point of interface at one moment in time would be described in detail, and so help clarify where, when, and how the data are integrated.

Reducing Descriptive Dimensions

The existing mixed methods typologies are too numerous to describe here. Instead, I present a list of six descriptive dimensions that I distilled from the published literature. For a brief description of the 15-plus typologies, readers should refer to the three-page table in Creswell and Plano Clark (2011) or the summative table presented by Natasi et al. (2010). For more in-depth coverage of any one typology interested readers will need to seek out the original sources. (To date, no single resource describes all the typologies in detail.)

Common Descriptive Dimensions

- Timing of the interface between data sets (e.g., simultaneous or successive)
- Purpose of the interface between data sets (e.g., inform, explain, triangulate)
- Theoretical orientation (e.g., inductive vs. deductive, interpretive, feminist)

- Purpose of the research (e.g., advocacy, applied, theoretical)
- Number of points of interface or degree of integration (e.g., fully or partially integrated/mixed, single, or multistrand)
- Relative importance of qualitative data and quantitative data (weighting)

These dimensions are not exhaustive. They do not, for example, explicitly include some of the typological criteria proposed by Natasi et al. (2010), particularly *inference quality* (how validity is assessed) and *synergy* (relationship between the researcher/research design and the study participants/community). I selected these six dimensions because they are common to many of the systems of mixed methods classification that contain distinct research-design categories with labels (as opposed to those with continua).

Although each dimension may be important in the conceptualization and planning of a study, not all are relevant to the *description* of a study's design. I would argue that two dimensions are enough—the *timing* and *purpose* of integration. In one form or another, these two dimensions pervade all major typologies. Together, these dimensions have enough descriptive power to portray the diversity of mixed methods designs (assuming that the unit of reference is shifted).

The timing of integration is critically important because it not only conveys when data sets are used with respect to one another but also whether the data sets depend on each other (e.g., a sequential or concurrent design).

The purpose of integration denotes the reason for connecting or mixing data sets at each stage of the research process. Describing and diagramming the purpose and timing of the points of interface provide enough information for research consumers to adequately understand a study's design.

The reduction in descriptive dimensions to *timing* and *purpose* does not sacrifice much descriptive capacity. Consider that three of the four dimensions that were excluded—*theoretical orientation*, *purpose of the research*, and *number of strands/degree of integration*—refer to the *overall* study, not to specific data sets or points of interface within a study. By shifting the focus of the description, the need for these dimensions is negated. Furthermore, the *theoretical orientation* and the *purpose of research* apply to all research endeavors and are not unique to mixed methods. Most scholars would define mixed methods research as the integration of quantitative and qualitative data within a single study or program. It follows that we should use those dimensions that are most germane to that definition.

The other excluded dimension is *weighting*, which refers to how qualitative and quantitative data are conceptually prioritized relative to each other within a study. The inclusion of weighting in a study's description is problematic on a number of levels. Most research is fluid, and even the most carefully designed research may not fall into place as planned (Bryman, 2006). Oftentimes the data themselves dictate the weighting, despite the best intentions of a researcher (Teddlie & Tashakkori, 2009). It may turn out that the qual + QUAN analysis that was planned is derailed by the validity of the quantitative instrument, so instead one is forced to emphasize the qualitative data in the final report. The relative priority of data sets is ultimately determined at the data interpretation and presentation stages of research, rather than the research design phase. Researchers often wait until the writing phase to determine which data to include or exclude, which data to emphasize in the results section, and which data to highlight in the summary, discussion, or abstract.

Moreover, the relative weight given to qualitative or quantitative data is partially out of the researcher's control. Each reader brings his or her own evaluative lens to a manuscript or research proposal and may prioritize the data sets in a different way than intended by the author. Policy makers may act solely on what a researcher determined was the "less important" data set. For example, I have observed a group of clients (representing a Fortune 500

company) completely forget the copious amounts of quantitative data presented to them as soon as they watched a 15-second video clip of one of their customers vehemently disparaging their product. The company's decision to act was ultimately based on that one piece of qualitative data. I have observed the same phenomenon with large funding organizations as well. In short, relative weighting is often in the eye of the beholder.

An Alternative Method of Description

How might my suggestions be used to describe a complex mixed methods study that existing typologies cannot accurately capture? The purpose behind, and a reader's expectation for, a research design's description may differ depending on where it appears in a manuscript or proposal. A pragmatic approach therefore is to think about the required level of descriptive detail according to where it occurs: in the title, the abstract, a summary narrative, or in the methods section.

Describing the Study in the Title, Abstract, or Summary Narrative

- Explicitly describe the study as “mixed methods”
- State the number of points of interface or stages within the study
- State what types of data sources are involved (e.g., surveys, focus groups, etc.)

Describing the Study in the Methods Section

- Include a diagram of the study.
- Describe the timing and purpose of each point of interface and the data sources involved. Do so for each stage of the research process: data collection, data analysis, and interpretation. Options (not exhaustive) in this regard include:

Timing of integration

Qualitative and quantitative data sets are analyzed independently, and close in time (“concurrent,” “parallel,” “convergent,” or “simultaneous”)

One type of data set is transformed into a data set of the other type (“conversion”)

One data set is collected/analyzed prior to another (“sequential”)

Purpose of integration

One data set provides information for subsequent data collection and analysis procedures

One data set explains or enhances the results from another data set (including the converted version of the same data set)

Two or more data sets are compared and their relationship to each other observed (e.g., converge, diverge, contradict)

Referring back to the example in Figure 1, one could initially describe the study in the abstract or overview as a “mixed methods study that combines participant observation, focus groups, in-depth interviews and surveys.” A more detailed description of study procedures, including a diagram, would be provided in the methods section.

How do the suggestions I propose relate to the rationale for typologies described by Teddlie and Tashakkori (2009)? A case can be made that changing our focus to the points of interface will better support the five reasons described by the authors.

Typologies provide tools that help researchers design their studies

- Focusing our attention on the points of interface should facilitate good research design. If the points of interface are appropriately justified, well executed, and adequately described, the foundation for a solid mixed methods research study will be laid (regardless of what we call the design). Changing the focus of mixed methods classification to the point-of-interface level forces researchers to think, plan, and write more explicitly about how and why they are going to connect the pieces within a research study.

Typologies establish a common language for the field

- Simplification usually facilitates communication. By reducing the number of dimensions that need to be considered, we simplify the description of a mixed methods study.

Typologies help provide structure to the field

- Structures need to be useful. For many mixed methods studies the existing typologies do a good job of representing research designs and are therefore useful. However, in a good number of cases they are not adequate and can create frustration and confusion rather than guidance. Although what I propose here does not provide more structure, it would mitigate the frustration of trying to find a name for a complex research design from a set of incongruent typological labels.

Typologies help legitimize the field

- Having typologies that do not capture all the complexity and fluidity of contemporary research studies may actually decrease the perceived legitimacy of formal mixed methods terms and typologies. Creating an alternative way of describing studies that do not fit existing molds mitigates this problem by giving researchers more conceptual freedom to accurately describe their studies.

Typologies are useful pedagogical tools

- Disconnecting research design from typologies would provide students and novices in the field with an alternative way to describe complex research design when current typologies are not sufficient. Reducing the number of descriptive dimensions would also facilitate pedagogy, as there are fewer conceptual elements and less nomenclature to explain.

Concluding Discussion

In this article, I described some of the limitations associated with mixed methods typologies and I examined how they measure up to the five expected benefits of typologies proposed by Teddlie and Tashakkori (2009). Based on this examination I argued that existing typologies are not, in many cases, providing the desired benefits and cannot adequately capture the complexity of many contemporary research designs. As a possible solution I suggested shifting the descriptive unit of reference to the points of interface within a study (rather than referring to an entire study) and reducing the number of descriptive dimensions to two—the timing and purpose of data-set integration.

I am not suggesting that we discard typologies. Nor do I wish to denigrate the important work of mixed methods scholars who have spent years developing and revising typologies. Typologies have been, and will continue to be, an important part of mixed methods pedagogy and discourse. For many mixed methods studies that are simple in design and less iterative in nature, the existing systems of classification work well. But I would argue that, *when necessary*, we should shift the level of reference down a level to the point of interface between data sets and focus on only two dimensions—timing and purpose of data integration. This would lessen the challenges of trying to squeeze the complexity and fluidity of many projects into fixed research design boxes and lexicons.

I should acknowledge that although I have made many observations of research practices, my descriptions are anecdotal. My observations do not cover the complete breadth of research disciplines, nor are they systematic. It might be useful to conduct a systematic study of published articles across a large range of disciplines. Each article could be coded based on (a) if, how, and where in the article the authors refer to “mixed methods”; (b) if, how, and where in the article the authors refer to typological nomenclature; and (c) whether the research design fits into an existing system of classification. Such a study might indicate the degree to which the issues described in this article are prevalent within the research community.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

- Bryman, A. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research, 6*, 97-113.
- Chambers, R. (1994). The origins and practice of participatory rural appraisal. *World Development, 22*, 953-969.
- Creswell, J. W., Klassen, A., Plano Clark, V. L., & Clegg Smith, C. (2011). *Best practices for mixed methods research in the health sciences*. Bethesda, MD: Office of Behavioral and Social Sciences Research, National Institutes of Health. Retrieved from http://obssr.od.nih.gov/scientific_areas/methodology/mixed_methods_research/index.aspx
- Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
- Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.
- Greene, J. (2007). *Mixed methods in social inquiry*. San Francisco, CA: Jossey-Bass.
- Greene, J., Caracelli, V., & Graham, W. (1989). Toward a conceptual framework for mixed-method evaluation design. *Educational Evaluation and Policy Analysis, 11*, 255-274.
- Ivankova, N., Creswell, J. W., & Stick, S. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods, 18*, 3-20.
- Johnson, R., & Onwuegbuzie, A. (2004). Mixed method research: A research paradigm whose time has come. *Educational Researcher, 33*, 14-26.
- Johnson, S. (2006). *The ghost map: The story of London's most terrifying epidemic—and how it changed science, cities and the modern world*. New York, NY: Riverhead Books.

- Leech, N., & Onwuegbuzie, A. (2009). A typology of mixed methods research designs. *Quality & Quantity, 43*, 265-275.
- Maxwell, J., & Loomis, D. (2003). Mixed methods design: An alternative approach. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (pp. 241-272). Thousand Oaks, CA: Sage.
- Mill, J. S. (2008). *Auguste Comte and positivism*. Rockville, MD: Serenity. (Original work published 1865)
- Morgan, D. (1998). Practical strategies for combining qualitative and quantitative methods: Applications to health research. *Qualitative Health Research, 8*, 362-376.
- Morse, J. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing Research, 40*, 120-123.
- Morse, J., & Niehaus, L. (2009). *Mixed method design: Principles and procedures*. Walnut Creek, CA: Left Coast Press.
- Natasi, B., Hitchcock, J., & Brown, L. (2010). An inclusive framework for conceptualizing mixed methods design typologies: Moving toward fully integrated synergistic research models. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research*. (pp. 305-338). Thousand Oaks, CA: Sage.
- Plano Clark, V. L., & Creswell, J. W. (2008). *The mixed methods reader*. Thousand Oaks, CA: Sage.
- Plano Clark, V. L., Garrett, A., & Leslie-Pelecky, D. (2010). Applying three strategies for integrating quantitative and qualitative databases in a mixed methods study of a nontraditional graduate education program. *Field Methods, 22*, 154-174.
- Romney, A., & Weller, S. (1988). *Systematic data collection*. Thousand Oaks, CA: Sage.
- Tashakkori, A., & Teddlie, C. (2003). The past and future of mixed methods research: From data triangulation to mixed model designs. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (pp. 671-701). Thousand Oaks, CA: Sage.
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks, CA: Sage.