

# Mixed Methods, Mixed Methodology Health Services Research in Practice

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*Mixed methods, mixed methodology research is a little documented but increasingly accepted approach employed to investigate organizational phenomena. The author presents a synthesis of literature that informed the decision to adopt a mixed methods, mixed methodology, dominantly naturalistic study approach to health services research in which she explored the process and organizational consequences of new artifact adoption in surgery. She describes the way whereby a collective case study involving five Australian hospitals yielded quantitative and qualitative data that were analyzed using inductive and/or deductive reasoning. She goes beyond the theoretical rationale for employing a mixed methods, mixed methodology approach to present a summative conceptual model of the research process and describe the structural aspects of the dissertation in which the research was reported that should benefit researchers contemplating the value of such an approach.*

**Keywords:** *mixed methods; mixed methodology; health service organization; technological change*

**W**hen I embarked on my doctoral research, I, like all researchers, was confronted with the question, What is the best way to investigate my research problem? The trigger issue for my research manifested itself to me a few years previously, when I was a manager of operating theater services (OTSs). I had a hunch that many innovations in surgical “artifact” technologies that emerged for use in general surgery during the late 1980s and subsequently expanded into many other specialty areas had increased the volume of human labor required to produce procedures within the OTS. My concerns prompted me to initiate a discussion with the executive director of my hospital about the need to recruit additional staff. He was not supportive of my request. However, the memory of a rhetorical statement that he made during that conversation resurfaced during 1996, at which time I was at the data analysis stage of an exploratory study of operating theater nurses’ perceptions of the effects of new medical technologies on their work (Johnstone, 1997, 1998, 1999, 2000). He had said, “What are you complaining about—what, with all the money we’re investing in new technologies?” This became the trigger for me to ask several questions that guided the present research: What are top managers’ assumptions about, and expectations of, their hospitals’ investments in new surgical

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**AUTHOR’S NOTE:** This research was assisted by postgraduate research funding from Macquarie University, Sydney, NSW, Australia, and a special studies program grant from Charles Sturt University, Bathurst, NSW, Australia.

QUALITATIVE HEALTH RESEARCH, Vol. 14 No. 2, February 2004 259-271

DOI: 10.1177/1049732303260610

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artifacts? What is the role of new surgical artifacts in surgical production? How, and why, are decisions made to adopt them? and What is the impact on the receivers of those technologies?

One of Lincoln and Guba's (1985) defining characteristics of a research problem is that it is "a state of affairs that begs for additional understanding." They proposed that "the purpose of research inquiry is to 'resolve' the problem in the sense of accumulating sufficient knowledge to lead to understanding or explanation" (pp. 226-227). After much reading in the research methods and methodology literature, I settled on a collective case study as the research design. I hoped that the various quantitative and qualitative data that I would collect and proposed to analyze, using a range of qualitative and quantitative methods involving inductive and/or deductive reasoning, would provide "multiple sources of converging evidence" (Yin, 1994, p. 93) that would resolve the research problem.

Ultimately, the theoretical contributions of the research were derived using the methods and assumptions that are consistent with the naturalistic paradigm, which was the dominant paradigm of the research. However, I drew some conclusions using the methods and assumptions of logical positivism, which was the secondary paradigm of the research.

Such a mixed methods, mixed methodology approach is recognized by researchers as a relatively uncharted one (Cresswell, 1994, p. 176), albeit one that is growing in acceptance. I have written this article with the desire to contribute to that charting process. That a collective case study design was used is largely incidental to the present article, which has as its focus the challenges of mixing methods and methodologies in a single study.

I will start with a synthesis of literature on research methodologies and then discuss the main related issues that I needed to resolve before any of my investigative activities could commence. I present and explain a conceptual model of the resultant research process, then describe the structural aspects of the 104,000-word dissertation in which the research was reported. The conceptual model, like the research process itself, evolved over the 4½ years it took me to bring the research activities, and the dissertation, to closure.

## RESEARCH PARADIGM ISSUES

The "paradigm debate" is a long-standing one. (See, for example, Popper's [1959/1968] *The Logic of Scientific Discovery*, which was originally published in German in 1934.) A wide range of eminently well-reasoned views are currently held on what constitutes "truth" and how it is discovered. Somewhere in the middle of the prevailing wide-ranging views is a pragmatic school of thought, which holds that "a false dichotomy exists between qualitative and quantitative approaches and that researchers should make the most efficient use of both [approaches] in understanding social phenomena" (Cresswell, 1994, p. 176; cf. Patton, 1988). Wolcott (2002) went so far as to say that "placing the approaches in opposition does a great disservice by detracting from the contribution to be made by each, including what each can contribute to the other" (p. 99).

Case study organizational research of the type employed in this study is located in the research paradigm variously known as qualitative research, naturalistic inquiry, the constructivist approach, postpositivist or postmodern perspective, or

the interpretative approach (Cresswell, 1994). I prefer for several reasons to use the term *naturalistic inquiry* (DePoy & Gitlin, 1994; Erlandson, Harris, Skipper, & Allen, 1993; Miller & Fredericks, 2002; Stake, 1995) to describe my research. First and foremost, this was categorically sociotechnical research, conducted in a natural setting as opposed to a laboratory or controlled setting (Erlandson et al., 1993). Second, the study's data were neither solely qualitative nor quantitative in their nature or their methods of analysis, nor methodologically limited to inductive or deductive reasoning.

The decision to undertake a mixed methodology study was not taken lightly because of the long and checkered history of the issues that have divided the naturalistic paradigm from the traditional scientific research one, known variously as experimental, rationalistic, or positivist research, or, collectively as logical positivism (DePoy & Gitlin, 1994, p. 17). The following arguments were among those that influenced the decisions I made about my overall research strategy in this regard.

Cresswell (1994, pp. 4-7), for example, synthesized the work of Firestone (1987), Guba and Lincoln (1988), and McCracken (1988) when he compared the assumptions of the two paradigms from the ontological, epistemological, axiological, rhetorical, and methodological perspectives.

The ontological assumption of logical positivism is that reality is objective and predictable (DePoy & Gitlin, 1994, p. 17). Conversely, the ontological assumption of naturalistic research is that reality is subjective (Cresswell, 1994; Stake, 1995).

The methodological perspective relates to the underlying logic, or ways of thinking about the data: whether data are interpreted from a prior frame of understanding (i.e., deductively) or not (i.e., inductively) (DePoy & Gitlin, 1994, pp. 6-8; cf. Popper, 1959/1968, pp. 27-34, 44-48). It must be distinguished from "method," which refers to types of data (i.e., qualitative or quantitative), the tools employed in collecting the data (such as interviews or quantitative measurements), and the techniques for analyzing the data (such as content analysis or statistical methods) (cf. Erlandson et al., 1993).

The epistemological perspective is concerned with the relationship of the researcher to what he or she is researching. Here, the logical positivist researcher is deemed to be independent of what is being researched, whereas the naturalistic researcher interacts with the study phenomenon, usually over a prolonged period. In this connection, Patton (1991, cited by Cresswell, 1994) recommended that the researcher "keep his or her assumptions explicit at all times" (p. 179; cf. Lawler, 1991), an important reason why I have declared the endogenous, or "insider," characteristics of this research arising from my professional background in OTSs.

Traditionally, commitment to a particular ontological position demanded a commitment to a particular paradigm's epistemological or methodological assumptions. However, there is growing support for a less rigid interpretation and application of the principles involved (Miller & Fredericks, 2002, p. 982), and the present research testifies to this development.

The axiological assumption of logical positivist research is that it is value free and unbiased, as opposed to naturalistic research, in which the researcher acknowledges his or her values and biases, as well as the value nature of the information gathered from the field. These distinctions, combined with the relationship of the researcher to that which is researched, influence the rhetorical assumption, which concerns the choice of language used in the reporting of the research. Convention has it that "each paradigm has its own appropriate rules and criteria"

(Erlandson et al., 1993, p. xiii), and so the terms that are used to describe naturalistic research are customarily quite different from those used to describe positivist research. Schmuttermaier (1999), for example, suggested the use of the terms *proposition* instead of *hypothesis* (consistent with Yin, 1994), and *extrapolation* instead of *generalization*. It was because of these rhetorical distinctions that I chose to refer to the human contributors to my research as *informants* rather than *participants*. Furthermore, Erlandson et al. (1993) have drawn attention to the fact that naturalistic researchers refer to a "guiding framework" for their research, as opposed to what positivists refer to as "designing" their research. However, in the case study method, Yin (1994) does not have a problem with the term *research design* or the notion of generalizing to theory (cf. Morse, 1999), a position that I adopted.

Furthermore, the language of choice in my dissertation, as it is here, was the personal and relatively informal voice of a naturalistic researcher rather than the formal, impersonal voice that characterizes logical, positivist research reports. The personal voice is an acknowledgment that the researcher is a participant in the phenomena being studied, that he or she made choices in the course of the research that would have influenced what data were collected and reported, or not collected, and that the explanation that was finally offered was one that was unavoidably influenced to some extent by his or her own worldviews (Erlandson et al., 1993).

As previously mentioned, there is a long-standing view that methodology is linked to the ontological and epistemological assumptions of the selected research paradigm and that methodologies cannot be mixed (Guba & Lincoln, 1988). However, one of the "voices" to the contrary has been Patton, who, in 1988, argued for a "paradigm of choices": that paradigms should not be assumed to be rigid and fixed, that they are not prescriptive but only descriptive, and that researchers should not have to choose between paradigms. He posited that "different methods are appropriate for different situations" (p. 119) and that "wherever possible, multiple methods should be used" (p. 136). Implicit in this statement is support for mixing in a single study ways of thinking about data, indeed, that both inductive and deductive reasoning can be complementary, rather than mutually exclusive, data analysis tools. The important thing, so far as Patton was concerned, is that "the notion of competing paradigms incorrectly implies only two research options; [and] that there are no logical reasons why qualitative and quantitative approaches cannot be used together" (p. 117). Hassard (1993) drew similar conclusions in his four-paradigm organizational research "experiment," although he did not approach the issue using the positivist-constructivist dichotomy. Rather, he used Burrell and Morgan's (1979) "four paradigms for organizational analysis" (cited in Hassard, 1993, p. 89) and concluded that "paradigm heterodoxy holds many benefits for organizational analysis" (p. 110), not the least being a realization of epistemological variety in organizational studies.

One generally held research design implication of the two paradigms is that the logical positivist researcher can design the entire research process a priori by choosing the concepts, variables, and hypotheses before the study begins, thereby limiting the role of personal interpretation for that period between the time the research design is set and the time the data are collected and analyzed statistically. Standard (naturalistic) designs, on the other hand, are dynamic and flexible ones that take shape during the research process (Guba & Lincoln, 1988). They call for the persons most responsible for interpretations to be in the field, making observations, exer-

cising subjective judgment, analyzing and synthesizing, all the while realizing their own consciousness. According to Patton (1988), however, actual studies seldom “exemplify all of the ideal characteristics of either paradigm” (p. 131; cf. Erlandson et al., 1993, p. x; Cresswell, 1994), and, based on his “paradigm of choices” view, they should not be expected to.

### **Mixed Methods Strategy in a Mixed Methodology Study Design**

I discovered in the course of my research that operationalizing an approach such as that supported by the likes of Patton (1988) and Hassard (1993) presents challenges at both the practical and the philosophical levels. I found that Cresswell’s (1994) questions on the topic of mixing methods in single studies were my questions, questions that needed resolution at various stages of the research process. For example, Cresswell asked,

if a researcher used an inductive, emerging qualitative stance in a study, does this mean that he or she must use qualitative data collection approaches such as observations and interviews? Alternatively, should a deductive, theory-driven study in the quantitative paradigm always be linked with quantitative data collection procedures such as surveys and experiments? [Furthermore] can aspects of the design process other than methods—such as the introduction to a study, the literature and theory, the purpose statement, and research questions—also be drawn from different paradigms in a single study? (pp. 175-176)

In the course of his response to these questions, he noted that mixed methods research designs were “largely uncharted territory” (Cresswell, 1994, p. 176, citing Greene et al., 1989) and that it was not possible, at the time he was writing, to formulate a comprehensive set of guidelines concerning these issues. That said, Cresswell, along with DePoy and Gitlin (1994), provided a useful framework for working within a mixed methods, mixed methodologies approach when they distinguished, and described, three levels of integrated designs. At the lowest level is the approach that Cresswell called the “two-phase design,” in which the study phenomenon is investigated at different and separate stages using techniques conventionally associated with each paradigm.

Cresswell (1994) called the next level of integrated design the “dominant-less dominant design,” whereas DePoy and Gitlin (1994) referred to their second level as a “mixed method strategy.” The distinguishing characteristic of this approach is that “the researcher presents the study within a single, dominant paradigm” (Cresswell, 1994, p. 177), but “within that framework, action processes are borrowed from either the naturalistic or experimental-type continua to answer a single research question or query” (DePoy & Gitlin, 1994, p. 22). DePoy and Gitlin called their third level a “fully integrated” design; Cresswell called it a “mixed-methodology design.” DePoy and Gitlin proposed that at this third level, the researcher “will use the frameworks of distinct philosophical traditions to answer different questions within one study” (p. 23), whereas Cresswell described it in terms of mixing aspects of both paradigms at all or many methodological steps in the design, “working back and forth between inductive and deductive models of thinking” (pp. 177-178).

Based on the distinctions offered by Cresswell (1994) and DePoy and Gitlin (1994), my research was categorically a fully integrated, or mixed methodology, design. The research design was a collective case study, and its dominant assumptions were consistent with those accorded the naturalistic paradigm. I also employed the methods of logical positivism—this being the secondary paradigm of the study—to resolve one of the research questions.

Although I noted Cresswell's (1994, p. 178) warning that the mixed methodology design "requires a sophisticated knowledge of both paradigms . . . that may be unfamiliar to many researchers" (pp. 177-178), I accepted the challenge of a relatively uncharted research method to produce the quality of outcome I desired for my dissertation. However, deciding how to structure my dissertation—in terms not only of where to locate particular content but also of how to present the content and in what detail—proved to be most challenging. It was very satisfying, then, that one of the examiners of my dissertation should remark that

the twin sets of different findings are neatly complementary in sustaining the dissertation [and,] given the proficiency with which each data set is handled, one is not left with a clear sense of skill differential or preference on the part of the researcher.

### **Why Mix Methods and/or Methodologies?**

One important question has thus far been addressed only in passing: Why should a researcher want to mix methods and/or methodologies? Greene et al. (1989, cited by Cresswell, 1994, p. 175) advanced five reasons. Among them are triangulation, complementarity, and expansion. Triangulation involves reviewing and analyzing evidence from multiple sources such that a study's findings are based on the convergence of that information (Erlandson et al., 1993; Yin, 1994). Complementarity means that "overlapping and different facets of a phenomenon may emerge, [whereas expansion means that] the mixed methods add scope and breadth to a study" (Cresswell, 1994, p. 175). All have the capacity to add rigor and credibility to a study and are powerful reasons for mixing methods and/or methodologies. Jick (1979, cited by Cresswell, 1994, p. 174) argued that the strength of the triangulation process lies in its capacity to neutralize any bias inherent in a particular data source, investigator, or method when used in conjunction with other data sources, investigators, and methods.

Data triangulation is an inductive process (Yin, 1994) and can involve various quantitative and/or qualitative data. A researcher might use a number of data collection strategies consistent with a single paradigm, such as a survey and an experiment (generally referred to as within-method triangulation) or, alternatively, data collection and analysis procedures from each paradigm, such as a survey and in-depth interviews (i.e., between-method triangulation) (Erlandson et al., 1993). Overall, the strength of data triangulation is that it results in a "thick description" of the phenomenon of interest that would not be possible if fewer data collection strategies had been employed (Erlandson et al., 1993, citing Guba, 1981; cf. Hassard, 1993, p. 109), essentially a case of all the data being necessary but insufficient on their own to explain a phenomenon in a rigorous and credible manner.

## CONCEPTUALIZATION OF THE RESEARCH PROCESS

Consistent with the epistemological assumptions of naturalistic research, in Figure 1, I outline how my engagement with the research problem started in 1967, when I was introduced to OTSs as a student nurse (see cell 1). My subsequent years of working in OTSs, combined with my academic studies in health services management, commerce, and health economics constitute a large part of the tacit knowledge that I brought into this research (cell 2). Some issues that I confronted when I was a manager of OTSs, particularly between 1990 and 1992 (after which I have not worked in OTSs), prompted me to undertake an exploratory study in 1996 (cell 3) whereby I began to broaden my understanding of the literature relevant to my dissertation (cell 4). The results of that preliminary study raised other questions that gradually synthesized into a specific research problem (Lincoln & Guba, 1985) that, in turn, translated into a number of research questions and propositions (cell 5). These influenced the development of my tentative study design (cell 6), which guided the subsequent “interactive, circular process of data collection, data analysis, and design review” (represented in cells 7 to 20) that, Lincoln and Guba (1985, cited by Erlandson et al., 1993) proposed, continues “until a point of redundancy is reached”—that is, until a point “where no significant new information emerges or no major new constructions are being developed” (pp. 70-71; cf. Commonwealth of Australia, 1995). This interactive, iterative process, which, throughout the data collection phase of the research included review of the literature on the same or emergent themes connected with related research and related theories (Marshall & Rossman, 1999) (see cell 18), is represented by the flows in Figure 1.

Planning my tentative study design (cell 6) was quite a difficult process, partly because designing quality research is not an easy task at the best of times but more so because of the practical implications of the research paradigm issues discussed earlier, in particular the philosophical considerations surrounding the inductive-deductive dichotomy (Cresswell, 1994; DePoy & Gitlin, 1994; Popper, 1959/1968).

My tentative study design underwent some changes (cell 19), mainly early in the data collection period. For example, I had originally envisaged more sites than the final five hospitals, and three rather than the final four categories of formal informants. The addition of a fourth informant category arose from my need for answers to questions about certain issues that consistently emerged during data collection (see cell 16) at the first two study hospitals.

Erlandson et al. (1993) explained how “the ‘human instrument’ allows data to be collected and analyzed in an interactive process, [how] as soon as data are obtained, tentative meaning is applied to them, [and] when new data are obtained, meaning is revised” (p. 39). The interviews with the 67 formal informants and the conversations and observations in the field of possibly several hundred individuals were first analyzed in this way (see cell 7) and tentative meaning applied.

Themes emerging from this initial inductive analysis (cell 7) and from the literature (cell 18) informed the selection of themes that were subsequently used in the deductive analysis of the audiotape-recorded interview transcripts and transcribed field notes (cell 9). The broken line linking cell 18 to cell 7 serves to acknowledge that all of the previously collected data, the interim conclusions drawn, and the literature had the potential to influence my reasoning, both consciously and

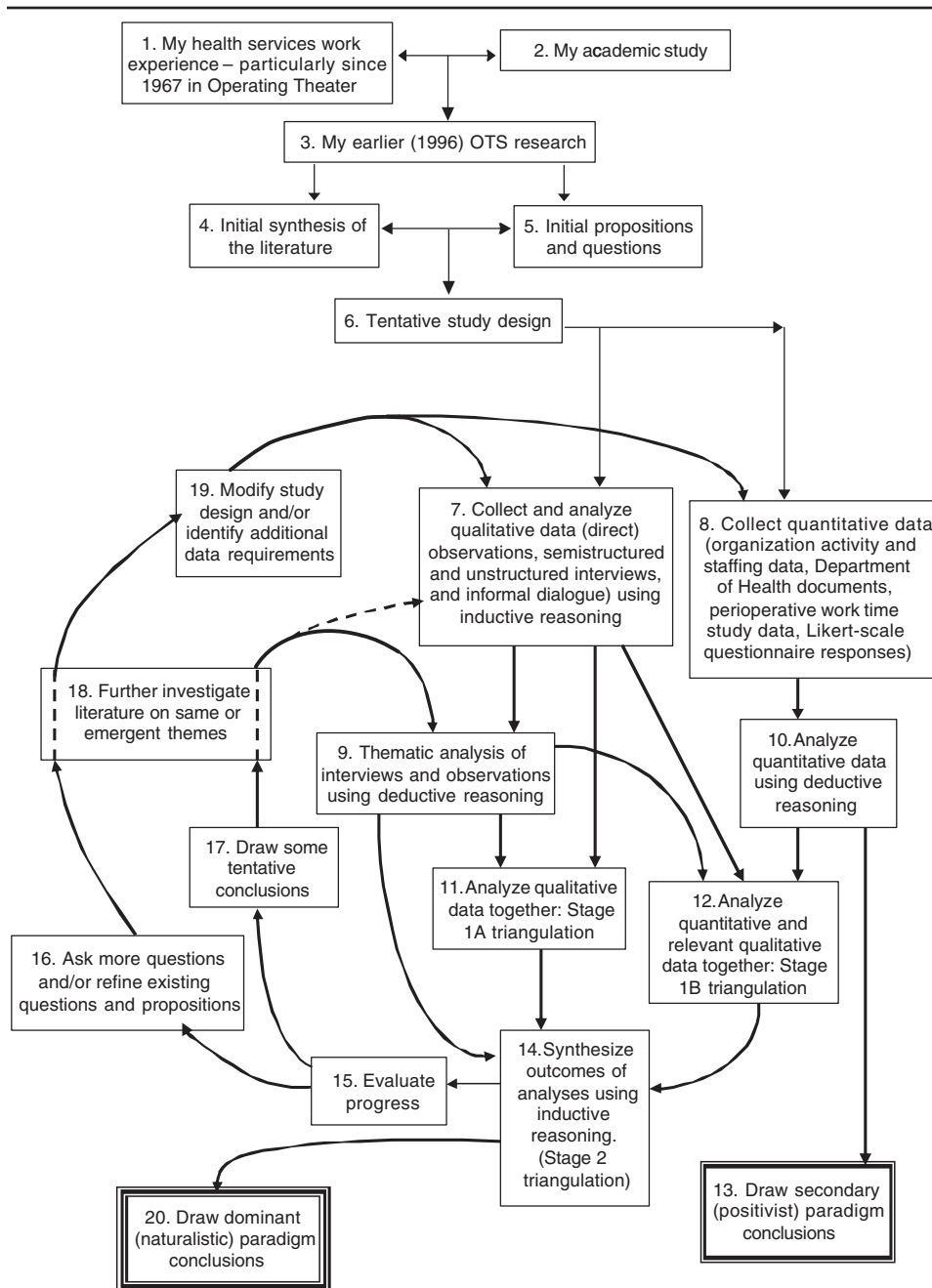


FIGURE 1: Conceptual Model of the Research Process

unconsciously, during the conduct of any interviews, conversations, and observational activities that followed.

Diverse quantitative data were also collected (cell 8), in some cases, for three sample periods in the 10 years commencing in mid-1988. Included among these data were procedural times for six procedures representing the four disciplines of



the procedural specialists who constituted one informant category. I selected the procedures of diagnostic curettage of the uterus, hysteroscopy, open and laparoscopic cholecystectomy, total knee replacement, and colonoscopy, because they were high volume and had either been introduced or had undergone technological change during the 10 years.

I calculated the total human labor input to each of these procedures from the procedural times extracted from OTS records combined with data I collected from a work time study of all the pre- and postprocedural (i.e., perioperative) labor input to each of the six procedures. Cell 8 also includes data pertaining to OTS staffing levels at each of the five hospitals, and statewide and hospital-specific separation rates for the six procedures. The deductive analyses represented in cell 10 produced grand mean values for a range of such measures that, in the first instance, led to the secondary paradigm conclusion (cell 13) and, in the second instance, were analyzed with the qualitative data (cell 12) as one stage of data triangulation.

Cell 14 represents the step of triangulating the available evidence both during the data collection phase and in the final phase. During the course of the research, one or more of various steps followed the evaluation of progress (cell 15) as depicted by the sequence of cells 16, 18, and 19 and, later in the research process, by cell 17 and possibly cell 18. At the final stage, the iterative cycle had "closed in" such that cells 9, 11, and 12 fed into cell 14 for the final time before drawing the dominant paradigm conclusion of the research (cell 20). The inductive reasoning that occurred at this final stage involved a back-and-forth reasoning process in which I checked the tentative conclusions drawn in the final stage of triangulation for consistency against the conclusions drawn in relation to each source of evidence (represented in cells 9, 11, and 12). Consistent with the observation of Erlandson et al. (1993), this "iterative refining process [did not cease] until the final report [had] been written" (p. 114).

In Figure 1, then, I map out my attempt to model the complex process just described. In it, I show how I analyzed interview data and other qualitative data both inductively and deductively at different phases, both during and after data collection (cf. Erlandson et al., 1993, pp. 113-114); how I analyzed the quantitative data deductively; and how the overall iterative process of data interpretation involving between-methods data triangulation was inductive.

There are strong similarities between this approach and the methods and assumptions of grounded theory, a naturalistic approach that DePoy and Gitlin (1994), drawing on the work of Glaser and Strauss (1967), have described as the "systematic discovery of theory from the data of social research [which is] a more structured and investigator directed strategy than [most other] designs along the continuum of naturalistic inquiry" (p. 142). Grounded theory systematizes the inductive incremental analytic process and the continuous interplay between previously collected and analyzed data, and new information (DePoy & Gitlin, 1994, p. 271) and even involves the investigator's working "somewhat deductively" (p. 267, citing Glaser & Strauss, 1967) as he or she brings the research process to closure. I concluded that although I employed a case study method consistent with that proposed by Yin (1993, 1994), the research process and the ways of thinking about much of the study's data during the data collection phase closely parallels the grounded theory approach described by Glaser and Strauss (1967). Between-methods data triangulation represents the more structured approach to analysis that I employed after all of the fieldwork had been completed.

The body of the conceptual model presented as Figure 1 portrays how these activities occurred in my mixed methods, mixed methodology research. In view of the fact that mixed methodology research is "largely uncharted territory" (Cresswell, 1994, p. 176), I propose that the conceptual model represents one of the theoretical contributions of my research. That said, I acknowledge the influence of existing models of the methodology of naturalistic inquiry (e.g., Guba & Lincoln, 1988) on the development of my model.

## STRUCTURING THE RESEARCH REPORT

It now remains to explore how I structured the research report/dissertation. Cresswell (1994) has offered some help here. He suggested that in a mixed methodology design, the introduction might be presented in an approach consistent with either paradigm. So far as the purpose statement and research questions/hypotheses are concerned, he suggested that if a single, dominant paradigm is employed, the purpose statement and questions or hypotheses should be "posed in the language of that dominant paradigm," whereas "a secondary purpose would be described in the language of the less-dominant design" (pp. 181-182). This is the approach I employed.

### *Introduction and Presentation of Models*

I commenced my dissertation with an introduction of several pages in which I summarized its content and informed readers: "The research design is a collective case study. It employs a mixed methods, mixed methodology approach that combines both inductive and deductive reasoning to draw its conclusions." I commenced the first of seven chapters with an introduction, followed by four sections: (a) introducing the research problem and the purpose of the study; (b) presenting the research questions that directed the research effort; (c) stating the research propositions, one for each paradigm; and (d) stating the theoretical and practical significance of the study. In the next section, I presented the theoretical material that comprises much of the present article. This was a precursor to presenting the first of two conceptual models, the first being Figure 1, in which I summarized my research strategy. In the next section, I presented the theoretical background to the collective case study research design, after which I presented and explained the second conceptual model (not included here), providing a snapshot of all of the data types in my study, based on Yin's (1994, p. 93) model of convergence of multiple sources of evidence. Chapter 1 closed with a section on the limitations of the study and a final section, in which I provided an overview of the dissertation chapters. Consistent with the dominant naturalistic paradigm of the study, I wrote chapter 1 in the first person whenever the alternative third person might have been used.

### **Theory and Literature**

The second challenge concerned the question of how to structure the presentation of the theory and the literature in a research report. This is not problematic in a single-paradigm study, because it is agreed that these should always be consistent with

each paradigm's conventions. However, Cresswell (1994) observed that "in a mixed methodology design, it is difficult, if not impossible, to mix the two paradigms in the use of theory and the literature" (p. 180). This does not mean that it cannot be done, for he went on to say that in practice, theory and literature can be used "without a strict interpretation of the inductive and deductive associations with their paradigms" (p. 180).

I decided to use the structural conventions of the positivist paradigm in my dissertation when, in chapter 3, I overviewed the theory and literature relevant to most of the study's outcomes. However, consistent with the conventions of its dominant paradigm—the naturalistic paradigm—theory and literature were not limited to chapter 3. Rather, they were included in chapters 1 (theories on research methodologies and research design) and 2 (literature pertaining to the study context, the research topic, and the occupational-professional background of the four informant groups), and subsequently woven into the presentation and discussion of the study's findings in chapters 5 and 6 (explained following). In writing the dissertation, I chose to use the positivist's impersonal voice in my synthesis of the literature in both chapters 2 and 3, and in chapter 4 (the research methods chapter). I also used the impersonal voice in parts of chapter 5 where the quantitative data were being objectively analyzed and reported. Otherwise, I used the personal voice of the naturalistic researcher, which I also employed throughout the last two chapters of the dissertation.

### Reporting Findings

The final challenge concerned reporting my findings. Cresswell (1994) cited an example of one approach from a study by Gogolin and Swartz (1992), who presented and discussed their qualitative and quantitative results separately and ended with separate discussions of the qualitative and quantitative implications. However, I used a different approach in my dissertation, because in the naturalistic-paradigm conclusions, I drew on almost all of the study data, both quantitative and qualitative. I presented the quantitative data in chapter 5 and brought the positivist paradigm proposition to closure in that chapter. Sometimes, however, I enriched the text with some contextualizing or explanatory qualitative data, but the positivist paradigm conclusion was not dependent on these qualitative data. Enriching selected parts of the discussion in this way in chapter 5 was the technique I employed to avoid repetition in the following chapter.

Chapter 6 was dedicated to reporting and analyzing the qualitative data, analyzing them in conjunction with relevant quantitative data and conclusions drawn in chapter 5 using between-methods data triangulation, discussing the findings, and drawing the dominant naturalistic paradigm conclusion of the dissertation. It was a substantially larger chapter than any other in the dissertation.

### Summary and Recommendations

The final chapter, chapter 7, constituted less than 4% of the dissertation. I opened it by stating,

The preceding chapters have dealt comprehensively with the conceptual, theoretical and methodological aspects of the present research, reviewed and synthesized a wide range of literature, presented, analyzed and interpreted the data, and thoroughly argued cases in support of both the secondary (positivist) and dominant (naturalistic) paradigm propositions of this thesis. It is not the intention in this final chapter to continue those arguments, for they were brought to closure in chapters 5 and 6 respectively. Rather, this chapter provides a summation of the outcomes of the present research and its principal theoretical and practical contributions. It concludes by making six recommendations for future research. (Johnstone, 2001, p. 276)

Overall, this type of structured reporting technique is both logical and practical. However, it belies the complex and continuous interplay that occurred throughout the research process between the literature, the qualitative and quantitative data, and the inductive and deductive reasoning that were applied variously to these data in the course of this research.

## CONCLUSION

In this article, I presented a synthesis of the literature that informed the decision to adopt a mixed methods, mixed methodology, dominantly naturalistic, collective case study design in doctoral-level health services research. I described the way whereby I employed both inductive and deductive reasoning in this little-documented, but increasingly accepted, approach and presented a summative conceptual model of the research process. I also described the structural aspects of the dissertation in which this research was reported and explained how, in writing the dissertation, I selectively applied the conventions of both the positivist and naturalistic paradigms, with deference to the latter, which was the dominant paradigm.

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