**Toward the Quality of the Quantity: Role of Sequential Exploratory Research Design for New Field Scholars****Suad Abedallah Dukhaykh Ph.D.**

Assistant Professor

Director of the Ph.D. Program in Business Administration

College of Business

King Saud University

E-mail:sxd455@case.edu

Saudi Arabia

ABSTRACT

In management literature, qualitative research has received limited attention. Many scholars undermine the importance of qualitative research as a method that lacks generalizability and objectivity. This paper argues that qualitative research promotes the development of compelling and rigorous and field research only if it is followed by quantitative research to confirm the findings on a large population. I delineate that qualitative research using grounded theory that followed by a quantitative approach is crucial when the state of prior work is nascent and there is no prior work on the construct and process under investigation and it is the optimal research design for new field scholars. I discuss the implications of the sequential exploratory research design for educating new field researchers.

KEYWORDS: grounded theory; quantitative research; sequential exploratory research.**Introduction**

“There’s no such thing as qualitative data. Everything is either 1 or 0.” (Fred Kerlinger)

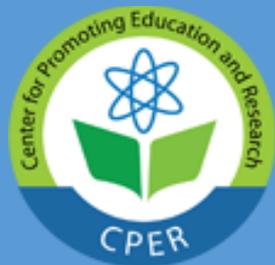
“All research ultimately has a qualitative grounding.” (Donald T. Campbell)

When investigating complex phenomena, the researchers have to make several important methodological decisions (Saunders et al., 2016). These decisions inevitably affect the outcomes and quality of the research process (Creswell & Clark, 2017). One of the first decisions the researcher has to make is whether the study will draw on qualitative, quantitative, or mixed-method inquiries. Importantly, both types of inquiries (qualitative and quantitative) are associated with certain limitations and issues. Thus, combining these two approaches results in strengthening the weakness of each method (Saunders et al., 2016).

Mixed method research is a relatively new methodological phenomenon and tradition, which originated in the early 1980s as an attempt to address the tensions between two methodological movements: the qualitative and quantitative (Tashakkori & Teddlie, 2003). Mixed method research is particularly relevant in the context of applied and multidisciplinary research and is supported by the philosophical tradition of pragmatism (Cameron, 2009). Pragmatism has been contrasted with the other two commonly used philosophical stances: positivism and social interpretivism (Saunders et al., 2016). While positivist philosophy is traditionally associated with quantitative methods, social interpretivism is used to guide qualitative research. Pragmatism, on the other hand,

allows the researcher to choose for any of the data collection instrument, depending on the chosen research problem and developed research questions (Saunders et al., 2016).

In its essence, mixed-method research allows us to simultaneously draw on two distinctly different types of data: qualitative and quantitative (Östlund et al., 2011). Teddlie and Tashakkori (2008) refer to the mixed-method research as the 3rd methodological orientation. According to Onwuegbuzie and Combs (2010), “... mixed analyses involve the use of at least one qualitative analysis and at least one quantitative analysis meaning that both analysis types are needed to conduct a mixed analysis” (p.414). Therefore, the researcher has to make an important decision regarding how the different strands of data will be collected, analyzed, and integrated. Tashakkori and Teddlie (2003) developed a classification of mixed-method research, which identifies six distinct types based on the stage of the study; the quantitative and qualitative approaches are mixed. Tashakkori and Teddlie (2003) distinguish between the three specific procedures: concurrent, sequential, and conversion. This classification clearly illustrates that the researcher may choose between data integration and collection to take place concurrently or sequentially. Such decision is only important when the different types of inquiries (qualitative and quantitative) are used to answer the same research question; sometimes, on the contrary, the purpose of using the different types of instruments is to prepare the next phase of the research (Bryman et al., 2008). Under such circumstances, there is no



need to integrate qualitative and quantitative data, as the obtained findings exist independently and can be interpreted separately (Saunders et al., 2016).

According to Schoonenboom and Johnson (2017), the overall purpose of mixed method design is to expand and strengthen understanding of a chosen phenomenon, via combining the quantitative and qualitative toolkit. The ultimate purpose of this type of research is to enhance knowledge and validity and design a study, which allows ensuring multiple validities legitimation (Schoonenboom & Johnson, 2017). This can be achieved via meeting validities of qualitative and quantitative research simultaneously (Östlund et al., 2011). There exist some reasons to adopt a mixed-method design. First of all, combining two or more independent data collection instrument allows for the process known as triangulation (Bryman et al., 2008). Triangulation allows corroborating research findings, verifying results of the qualitative and the quantitative parts. Another important merit of mixed-method research is the phenomenon of complementarity. The use of two or more methods allows one to address different research questions (Östlund et al., 2011). Saunders et al. (2016) also discuss facilitation as a reason to perform mixed-method research. Facilitation is concerned with using one type of data collection method to aid the adoption of the next one (e.g., an interview may be carried out before developing a questionnaire). Bryman (2006) argues that before adopting such a complex approach to empirical research, the scholar has to have a clear understanding of his/ her motivation. Saunders et al. (2016), however, point out that the majority of the researchers using mixed methods do not justify the use of such tactics.

While mixed method research is concerned with many merits, it combines the qualitative and quantitative data collection approaches, which both have their limitations and weaknesses (Saunders et al., 2016). Thus, potentially both groups of biases and accuracy issues can be introduced to one study. In addition to that, while clear guidelines exist regarding analysis of quantitative and qualitative data, combining and cross-comparing these results is a far more complex and bias-prone task (Saunders et al., 2016).

According to Edmondson and Mcmanus (2007), management field research is as systematic research that builds on primary or original data collection either quantitative or qualitative in real organizational settings. Management theory research falls into a continuum ranging from nascent to mature in which mature theory shows well theoretically developed frameworks and constructs that have been empirically investigated over a long period resulting in a strong grounded body of knowledge consisting of a broad agreement by a variety of researchers. In contrast, nascent theory suggests novel connections for new phenomena by presenting novel inquiries of how and why seeking tentative answers. In the middle, positioned between nascent and mature there is the intermediate theory that proposes further provisional

explanations of certain phenomena by proposing a new construct with relationships between the new construct and established constructs (Edmondson, Mcmanus, 2007).

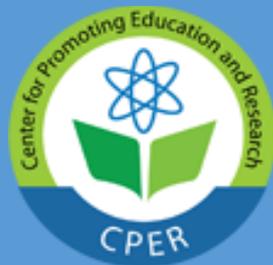
The primary aim of this article, thus, is to help new field researchers to develop and hone their ability to develop a theory by conducting grounded theory as a powerful data analysis tool commonly applied within mixed method research to test this theory by following up with quantitative research to confirm the findings by focusing on the nascent state of prior research where there is a chance for the emergence of new construct and perhaps new theory.

Grounded Theory and Immature State of Prior Work

The development of grounded theory is attributed to Glaser and Strauss, who worked together to study the experiences of terminally ill patients. Glaser (1978) defines grounded theory as a systematic social science approach of theory development via methodological collection and analysis of data. Age (2011) points out that the key characteristic of this approach is that grounded theory begins with developing a sociological perspective of a specific problem, as opposed to approaching it with a pre-developed model. Open coding is discussed as an element central to grounded theory (Glaser & Strauss, 1992). In its essence, open coding is concerned with the constant comparison of the collected data to generate different themes and categories. Open coding allows us to cross-compare the different incidents (observations, data) and is achieved by a process of continuous comparison (Rennie, 1998). Open coding may be followed by the research procedure known as axial coding. This is an intermediate step, aimed at developing some preliminary relations between the different groups of codes. This allows to develop the first groups of sub-categories (Saunders et al., 2016), and begin data synthesis.

The eventual goal of the procedure is to establish a so-called "core category" (Glaser, 1978, p.95). The core category can be viewed as an overarching theme (concept), connecting the various sub-categories identified within the study (Ghezaljah & Emami, 2009). Once the core category has been established, the next stage of grounded theory analysis is selective coding (Age, 2011). This approach is more selective, when compared to open coding, and allows to identify all the codes relative to the core category; the remaining themes are excluded from the analysis. Glaser (1978) discusses the concept of "theoretical memos" narratives, explaining the identified codes and their relation to the core category. The process of grounded theory analysis is concluded by theoretical writing elaborating description of the identified codes, and their relation to each other and core category (Age, 2011).

The abovementioned steps of grounded theory research are typically performed concurrently, as the researcher has to constantly obtain new evidence and revisit the previous conclusions. Glaser and Strauss (1967) discuss the



concept of “theoretical sampling” (p.45) as an important principle of grounded theory research, which means that each following stage of the study is determined by the previous ones, particularly by their outcomes. Ideally, the process of data collection and analysis has to continue until a point of “theoretical saturation” (p.61) is achieved. According to Glaser and Strauss (1967), such a point indicates that a substantial-quality and depth of theory has been achieved. Grounded theory has undergone major changes and evolution, which has also contributed to the changes in methodology and different views on how data collection and analysis have to be approached (Age,2011). It is important to point out that grounded theory is a general term for three distinctly different methodologies: traditional (Glaser), constructivist (Charmaz), and evolved (Strauss, Corbin, and Clarke) (Chun et al.,2019). Each of these distinct methodologies is an extension of the original grounded theory first developed by Glaser and Strauss. The first, classical, methodology is to create a theory, which explains a behavioral pattern relevant to the specific target population (Charmaz & Belgrave, 2012). The second approach is known as constructivist and is concerned with understanding how participants develop (construct) meanings of the relevant events. Finally, the third grounded theory methodology is closely interlinked with symbolic interactionism and emphasizes the role of the symbols, people associate with certain social interactions or processes (Chun et al., 2019).

However, regardless of the specific methodologies and schools of thought, there exist some common characteristics and approaches toward conducted grounded theory research. Jørgensen (2001) points out that grounded theorists traditionally put emphasis and prioritize the data analysis process as opposed to data collection. Despite that it is widely recognized that the nature and quality of data affect the study outcomes, as rich and full data sets provide an in-depth understanding of the problem (Glaser,1992;Glaser,1998). Although grounded theory research has almost become synonymous with the interview-based studies, a wide range of data collection tools is available to collect data: observations, ethnographic studies, documents, archival research, personal accounts, and narratives. Jørgensen (2011) refers to the simultaneous process of data collection and analysis as the hallmark of grounded theory studies. According to Saunders et al. (2016), drawing on grounded theory as a research approach is always time-consuming and reflective. Thus, the researcher has to have a clear motive to use grounded theory.

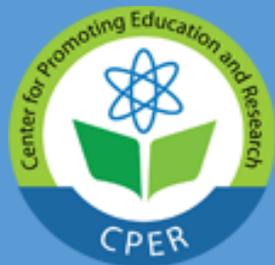
Another important issue concerns the limits and merits of grounded theory. Age (2011) points out that grounded theory, particularly classic methodology, is both highly useful and helps provide an understanding of a specific social problem. Grounded theory has a unique intuitive appeal and has a high potential for theory building and conceptualization due to its systematic approach to data collection and analysis (Saunders et al.,2016). Conducting research based on grounded

theory requires the researcher to immerse into the studied topic, thus becoming well familiarized with its unique social context, problems, participants, etc. In practical terms such immersion is concerned with the research constantly having to compare and contrast the obtained findings, reflecting on the studied phenomenon and the process of research (Glaser,1998). Mayers (2009) suggests that grounded theory research has the potential to foster creativity as it is based on the inherited notion of operating based on the absence of the “preconceived theoretical data” (p. 108). Such process flow encourages the development of new ideas and challenging the existing views. Grounded theory is typically based on inductive and creative processes of data analysis, which contribute to the emergence of the original findings (Lin, 2004; Sanderson & Fisher,1994).

As opposed to the positivist philosophical stance, grounded theory typically adopts an instrumental view on “truth”, typical to pragmatist philosophy (Creswell et al.,2003). Such rejection of a universal truth opens the methodology to criticism for lack of objectivity and accuracy (Age,2011). The approach has also been criticized for the issues related to poor generalizability and credibility. Golafshani (2003) argues that grounded theory-based research often lacks scientific rigor, quality, and trustworthiness. Indeed, specific procedures performed during data analysis are highly flexible and thus vary greatly between the studies allowing for subjectivity and significant bias (Golafshani,2003). Furthermore, Charmaz (1989) warns that grounded theory is a complex approach, which may not be necessarily suitable for novice researchers. The latter often tend to adopt purposive sampling instead of probabilistic sampling techniques, which reduces scientific rigor and maximizes subjectivity.

Nascent topics for which limited or no previous theory exists have attracted limited researchers. Research questions for this type of inquiry conducive to the inductive development of new emerging theory by developing insight and thoughts about a novel or unusual phenomenon as well as by explaining the surprising event occurrence and digging into a paradox in order to investigate how a process unfolds. Significant of these topics can come from surprising results, identifying and addressing gaps in existing theory, questioning assumptions in the extant literature, and accepted wisdom promulgated in the existing theory (Edmondson, Mcmanus,2007).

The research questions in the immature or nascent state of literature are more open-ended than those used to advance knowledge in the literature. In topics where theory is immature or nascent, researchers avoid hypothesizing specific relationships between variables since they do not expect what issues might emerge from the data. Thus, rich, and evocative data are needed to shed light on the phenomenon because little is known in the topic. Learning with an open mind by conducting interviews, observations and open-ended questions helps to ensure that key variables have been identified over the



research process. Data collection may involve interviews with organizational informants or the full immersion of ethnography (Edmondson, Mcmanus, 2007).

Frequently, researchers use a grounded theory to connect data to existing and suggestive new theory (Golafshani, 2003). In contrast to the quantitative process in which hypotheses are built and data are collected first and then analyzed, qualitative process data collection and data analysis often alternate and iterate in a process called theoretical sampling (Glaser & Strauss, 1967). Through the process of theoretical sampling, theoretical categories emerge and guide further data collection until theoretical saturation is reached (Eisenhardt, 1989b; Glaser & Strauss, 1967).

Sequential Exploratory Research Design

Mixed methodologist theorists and scholars have been emerging (Creswell 2003; Greene & Caracelli 1997; Mertens 2005; Mingers & Gill 1997; Tashakkori & Teddlie 2003). For the development of useful theory, several scholars have advocated cycling between detective theory testing and inductive theory building (e.g., Cialdini, 1980; Fine & Elsbach, 2000; Weick, 1979). Mixed methods research design's central philosophical assumption is that the combination of quantitative and qualitative approaches in a single research paper provides a better understanding of research problems than either approach alone. (Creswell, 2007).

Sequential exploratory research is one of the types of mixed-method research (Cameron, 2009). Creswell et al. (2017) define sequential research as a type of inquiry, which combines the quantitative and qualitative methods, collects and analyzes them in a sequence of stages. Under such a design, data collected during the first phase of the project is then used to guide and shape the second phase. These phases can be the same (e.g., qualitative) or different (qualitative or quantitative) in terms of the type of data collected (Sanderson & Fisher, 1994). Mertens (2005) stresses that sequential exploratory studies are fundamentally different from other types of mixed-method studies, which merely utilize a combination of qualitative and quantitative tools to answer different research questions. Sequential design, on the other hand, allows us to gradually build knowledge and combine the two types of inquiry with a larger and more complex research program (Cameron, 2009).

In an exploratory sequential design, themes that emerge from qualitative data are used to develop quantitative research to further explore the research problem and validate the established conceptual framework (Creswell and Plano Clark 2011; Teddlie and Tashakkori 2008; Onwuegbuzie, Bustamante, and Nelson 2010). As a result, the second stage of analyses is conducted through a quantitative study. The last stage is the integration of the two strands of data into one research paper (Creswell and Plano Clark 2011).

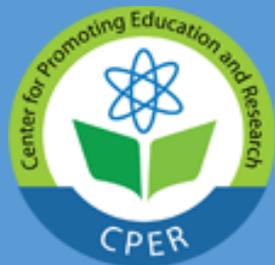
Conducting sequential exploratory research has a number of merits. Such a strategy can be adopted when there is little evidence or theoretical basis developed for the studied

phenomenon (Carbera, 2011). Secondly, such an approach can be used to guide the process of data collection instrument development. For example, if the first part of the study is based on interviews or observations, the obtained findings may then be used to develop a survey or other quantitative data collection tool (Creswell & Clark, 2017). The key rationale for choosing such an approach is that it allows the researcher to first explore the topic, before choosing for the specific variables to focus on. Such type of approach also allows the researcher to remain open to the new evidence, maintaining an open mind. According to Cameron (2009), such a type of inquiry also has a practical value. Sequential mixed method research is typically used in the context of exploratory studies, the 1st phase of the project may help develop a data collection instrument, as the latter is not available yet.

Cameron (2009) discusses an example of a study based on the sequential exploratory method. Such studies typically consist of different (sequential) phases. For example, during the first phase of the research, data is collected to build theoretical underpinning (Creswell & Clark, 2017). It is pivotal that at this stage of the research, data collection has to be combined with the data analysis. During the 1st stage of the research, the researcher has an opportunity to develop a model, which is then tested in the 2nd stage. Thus, the 2nd stage serves as a formative evaluation of the theoretical underpinning developed earlier (Carbera, 2009). Importantly, the research questions of the 2nd strand of the research emerged during the data analysis of the 1st phase (Tashakkori & Teddlie, 2003). Thus, the 1st stage of the sequential research is typically exploratory in nature and follows inductive logic.

Cameron (2009) emphasizes inferences as a characteristic feature of sequential research. Throughout such research, multiple inferences are typically made, and used to either complement or confirm the different parts of the study (Creswell & Clark, 2017). According to Teddlie and Tashakkori (2003), inferences can be defined as "... an umbrella term to refer to a final outcome of a study. The outcome may consist of a conclusion about, an understanding of, or an explanation for an event, (a) behavior, (a) relationship, or a case (e.g. in qualitative research)" (p.35). Cameron stresses that inferences may be used in various meanings: from purely quantitative (e.g., correlation) to purely qualitative ones. Inferences, along with the data triangulation, typically help the researcher combine and build stronger links between the different phases of the research. Despite that, the issues related to data alignment and displayed when it comes to linking the findings of the different phases of research is a highly complex issue (Creswell & Clark, 2017).

A sequential exploratory research design allows for an in-depth investigation of a chosen phenomenon even when there is a lack of theoretical or empirical evidence, which can be considered as major merit (Cooke, 1996; Cameron, 2009). Sequential studies drawing on mixed-method design are also



highly flexible as they allow the researcher to alter the initial course of the study based on the intermediate findings obtained during the 1st phase of the study. Such flexibility is impossible to achieve when performing quantitative research (Saunders et al., 2016).

At the same time, Teddlie and Tashakkori (2003) and Saunders et al. (2016) raise a question regarding the competence of the researchers attempting to combine the qualitative and quantitative types of inquiry. To successfully conduct such type of research the scholar has to be literate in both quantitative and qualitative data collection and analysis methods (Cameron, 2009). Another concern is that due to the sequential nature of such studies, mistakes made in the 1st phase of research inevitably contribute to bias and mistakes within the following phases of the study. Saunders et al. (2016) point out that typically mixed-method research lacks generalizability. This means that the findings obtained using mixed method research are applicable to the unique population, which was studied and may not reflect the perceptions, attitudes, or behaviors of a general population. This is due to the fact that such research is often context-dependent (Saunders et al., 2016).

The rationale for the sequential exploratory research design lies in exploring a topic before knowing what variables should be measured. Researchers can think of this approach as a template that is applied to a nascent area of literature. The first question to ask is what we already know in the existing literature. For situations where a literature review reveals limited findings to guide researchers, the qualitative phase might be rewarding in allowing researchers to discern a new conceptual framework that might guide researchers and open new venues when the state of prior research under the phenomena is limited. In general, the grounded theory will help researchers to identify new concepts and establish a connection between them in order to establish an immature theory.

Researcher's Perspective

The motivation for writing this commentary comes from my academic experience. As a doctoral student in 2015, I soon became interested in grounded-theory methodology, which I pursued with passion and enthusiasm when I was Ph.D. students in Weatherhead School of Management at Case Western Reserve University.

While conducting the grounded-theory methodology, I became increasingly interested in the philosophical assumption's underpinnings of this methodology. However, when I was discussing my research findings with academic colleagues and some faculty members, I received many critiques and conflicting opinions regarding the weakness of the qualitative methodology in terms of generalizability and subjectivity of the researcher.

However, for me coming from a different social context as I was born and raised in Saudi Arabia, it was crucial

to conduct a qualitative study using grounded theory approach since the state of prior research in the area and the context I was investigating is nascent. Most of the literature and well-developed theories and constructs in the area I was investigating were conducted in the western context.

My findings from my qualitative study I conducted during my first year as a Ph.D. student-guided my subsequent two quantitative studies. I built what I called mid-range theory based on my qualitative study that contradicts most of the western management theories. My dissertation was QUAL à QUAN à QUAN = A sequential exploratory design followed by two explanatory quantitative studies offered new emerging findings that contradict most of the western organizational theorists.

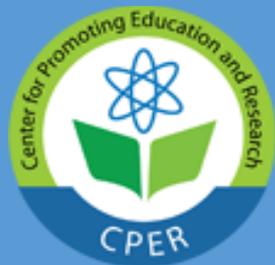
Challenge

Few researchers are prepared and ready to devote time to the specific demands of this genre of different research methods. The integration of multiple and diverse methods requires multiple knowledge of methodological traditions; capacity to learn, understand, apply, and adapt different text-interpretive and statistical data analysis and an ability to resolve the technical and interpretive complications (Bazeley, 2003). Having sufficient knowledge of methodology that one can be adaptable, flexible, and often innovative in the application of methods is essential elements for the successful application of mixed methods. This demands deep learning, depth of knowledge, and a personality that can tolerate messiness and ambiguity (Bazeley, 2003).

Implication

One implication of an emphasis on sequential exploratory research design is that new field researchers need to be exposed to both quantitative and qualitative research design, and they need to develop needed skills to conduct all of the research methods as well as general awareness of when each is most appropriate. In other words, they must be methodologically versatile. By having a larger toolbox, new field researchers will learn how to expand the types of research questions and how research questions can be answered effectively. Although not every researcher can have deep expertise and skill and become a renaissance methodologist within all research methods and techniques, a more realistic objective is to give students enough background of diverse research methods to become an effective researcher in particular methodologies.

The second implication of these ideas for sequential exploratory research design is the need to explicitly teach the notion of research designs. Students who start their career journey as scholars such as Ph.D. students don't have the well-grounded background of the literature in a specific research domain. Thus, encouraging them to start their scholarly journey with grounded theory may results in novel theory development that no one has explored previously which would enrich the literature with new theoretical frameworks or



possible new theory. Lastly, students can identify the weaknesses and strengths of each methodology and appreciate the ways that the scholars' choices were mutually reinforcing and effective.

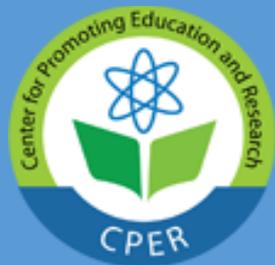
Conclusions

A sequential exploratory research design is a methodological approach, which is based on the simultaneous use of the qualitative types of inquiry followed by quantitative inquiry. Although various types of mixed method designs are available, sequential exploratory research appears to be the most advantageous to study research phenomena in the fields

where there is a lack of empirical evidence and theoretical underpinnings and also for new field researchers that don't have sufficient background in the literature. At the same time, using sequential analysis and mixed-method research, in general, is associated with several practical and conceptual problems. Grounded theory emerges as a commonly used and flexible data analysis approach applicable to studies that draw on mixed methods design. Grounded theory fosters creativity and development of the new ideas and theories, as its methodology is concerned with the researcher maintaining an open mind throughout the process of research.

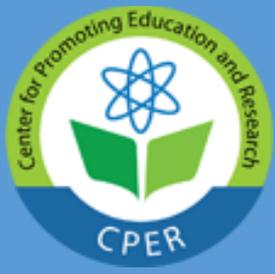
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