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A Comparative Analysis of Qualitative and Quantitative Research Methods and a Justification for Adopting Mixed Methods in Social Research

Abstract

The aim of this review is to create awareness about uses of available social research methods and to provide a guideline in adopting appropriate methods specifically in qualitative and mixed methods research genre. Based on the review of contemporary social research methods I believe that mixed methods research produces more accurate results than relying on either qualitative or quantitative methods alone in explaining complex social issues. This paper contributes to the methodological literature in two areas. First, create awareness among social researchers and students about the available research methods in order to help them to adopt suitable research designs in addressing their particular research questions. Second, encourage scholars from all disciplines to theorize further, especially in the field of mixed methods, and engage in a dialogue in order to improve methodological appropriateness for future research in social sciences.

Keywords: qualitative research methods; quantitative research methods, mixed methods research; social research paradigms

Correspondence: Muhibul Haq, Bradford University School of Management, Emm Lane, Bradford, West Yorkshire BD9 4JL. Email: m.haq@bradford.ac.uk, Ph: 07975544094

Author Biography

Muhibul Haq is a Social Researcher and is affiliated with the School of Management, University of Bradford. His research interests are Strategic Human Capita, Ethnic Minority Enterprises and Social Research Methodologies.

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Introduction

Social research has traditionally depended on two paradigms, the functional or scientific paradigm and the interpretive or constructivist paradigm (Shah and Corley, 2006; Scotland, 2012). A paradigm is a basic set of belief systems we hold and it is this belief system which guides our disciplined actions (Guba, 1990). The type of these paradigms (e.g., positivism, interpretivism etc.) can be distinguished based on their ontological (nature of knowledge or reality) and epistemological (relationship between the knower and the knowable) positions and methodological approaches (how to access the knowledge) as well as ethical standards (moral principles guiding the enquiry) (Guba, 1990; Bazeley, 2002). Those who follow the scientific paradigm tend to adopt quantitative research methods, whereas the constructivist paradigm leads to embracing qualitative tools and techniques of data collection and analysis. The divide between the two fundamental paradigms has increased over time due to continued differences in their philosophical underpinnings. For example, the scientific paradigm is based on the ontological assumption of objectivity, i.e., a single reality exists about a social phenomenon which can be understood using quantifiable facts obtained by adopting quantitative data collection and analysis methods (Shah and Corley, 2006). On the other hand, the constructivist paradigm implies that an objective reality does not exist since all realities are socially constructed (Maxwell, 2012; Wikgren, 2005).

The divide between the two approaches paved the way for a third approach called mixed methods. The justification of mixed methods use in social research is based on the pragmatic philosophical position and explicates that social realities can be better understood by using both qualitative and quantitative data collection and analysis methods in the same research (Creswell, 2002; Dellinger and Leech, 2007; Caruth, 2013).

In favor of this argument, researchers argue that it is difficult to capture social reality by following only either a positivist or a relativist paradigm and their associated methods because of their selective nature (Mays and Pope, 1995). Scholars also believe that a combination of the methods will help researchers to understand the nature of a social reality more coherently (Driscoll et al., 2007). Mixed methods research, therefore, has gained popularity gradually and researchers started using it as an alternative approach from a variety of disciplines including psychology, education, health, sociology, business and management, ecology and environment (Bryman, 2006; Caruth, 2013; Driscoll et al., 2007; Jogulu and Pansiri, 2011). It is the pragmatic nature of mixed methods that some researchers argue mixed methods help achieve multiple goals, such as; explanation, confirmation and triangulation (Jick, 1979; Caruth, 2013; Gioia and Thomas, 1996; Creswell, 2002; Tashakkori and Teddlie, 2010; Teddlie and Tashakkori, 2012; Feilzer, 2010) in explaining complex social constructs. For example, it was found in the United Kingdom in the last decade that the rise in volume of quantitative social data required alternative methods (qualitative followed by mixed methods) in order to better investigate social policy related questions (Brannen and Moss, 2012).

Subsequently, a number of scholarly resources were made available for researchers and students to guide them in how and when to choose mixed methods. These include, but not limited to, *The Handbook of Mixed Method Research* (Tashakkori and Teddlie, 2010) as well as *Journal of Mixed Methods* and *International Journal of Multiple Research Approaches* (Brannen and Moss, 2012; Denzin, 2010).

The first motivation to write this review came from the realization that in spite of availability of the above guidance and the fact that mixed methods offer clear benefits over the other two methods, an interdisciplinary dialogue seems to be absent in the methodological literature. Although this call is not new as others (Denzin, 2010; Creswell and Garrett, 2008) have already asked for a debate in this area, their call has not gone far enough in making clearer the emerging nature of mixed methods and acquainting novice researchers and students with methodological trends and complexities.

The second motivation in writing this paper came from the concept of the so called paradigm wars. As outlined by Denzin (2010) researchers in social sciences witnessed at least three paradigm wars since 1980s. Historically, the result of the first war was the decreased popularity of positivism and the increased use of qualitative methods, while the second paradigm war resulted in mixed methods being increasingly used. The third war emerged in the 1990s and still is going on. As a result pragmatic approaches became trendy in addressing social research questions, i.e., researchers found compatibility in combining both qualitative and quantitative methods in the same research project. The third war also gave birth to other similar, but not the same as mixed methods, moments (such as emergent-methods and evidence-based discourses (Denzin, 2010)). Elaboration of these moments is not in the scope of this paper.

In the light of the above two motivation factors I posit, based on the methodological literature that the lack of coordination and cooperation across the social research spectrum is leading to

isolated furtherance of methodological knowledge and practice by each discipline in confinement. One may argue that the prevailing divergence or lack of coordination among disciplines and scholars might be an opportunity for further research as research methodologies keep evolving, specifically mixed methods which “*has not yet reached the consensus stage*” (Creswell and Garrett, 2008). Nevertheless, the lack of cooperation among disciplines and scholars results in lack of understanding of methodological adoptability and appropriate training in methodological issues. This in turn causes negative consequences in social enquiry (Denzin, 2010) when it comes to mixing methods according to specific social research questions in context, such as cultural and religious sensitivities as well as space and time.

In other words, mixed methods research boundaries are still blurred and perhaps this is why some researchers (e.g., Thornberg, 2010) tend to believe that they have used mixed methods in their research when in fact they have only described their small qualitative samples in numbers. More specifically, while quantifying qualitative data is not rare, merely describing purposefully selected small samples in numerical form and calling it mixed methods is questionable if we consider the widely used definitions of mixed methods (Driscoll et al., 2007; Jogulu and Pansiri, 2011; Creswell and Plano Clark, 2007; Creswell and Tashakkori, 2007).

In summary, I argue in this paper, that the social research community from various paradigmatic standpoints needs to communicate to each other so that issues surrounding methodological adaptation, particularly in mixed methods, could be demystified and social researchers could have a clearer understanding about the methods appropriate for them to use. To achieve the above objective, I compare and contrast qualitative and quantitative methods at each stage of the research process by providing brief examples of most widely used tools/techniques. This comparison highlights the unique weaknesses and strengths of qualitative and quantitative methods and will help researchers, especially novices and students, in choosing and tailoring research methods in the context of their research questions and according to their epistemological and methodological positions. I then discuss mixed methods, in relatively greater detail, as a way of a tailored research design. This is followed by a critical evaluation of complementary benefits and non-overlapping disadvantages when qualitative and quantitative methods are mixed. By doing so, I argue that researchers can achieve more reliable research outcomes when mixed methods are adopted. Table 1 summarises advantages and disadvantages of using qualitative, quantitative and mixed methods social research. Furthermore, this paper advocates for the adoption of a pragmatic research approach and encourages further theorization and empirically investigation to illuminate the usefulness and limitations of social research methods, particularly mixed methods. This will guide social research community in generating knowledge leading to better understanding of complex social constructs within specific social, economical, religious, cultural and political settings.

Comparing and Contrasting Qualitative and Quantitative Research Methods

Qualitative Social Research

Qualitative research became popular as social research methodology since 1960s when social scientists realized that they needed to understand complex social issues much further than before when they relied on quantitative methods (Alasuutari, 2010). In other words, qualitative research is typically concerned with inductive analysis of a social reality with a descriptive and exploratory orientation (Guest et al., 2011).

Table 1: Comparison of Qualitative, Quantitative and Mixed Methods in Social Research

Issue	Qualitative methods	Quantitative methods	Mixed methods
1. Overall aim	Understanding and explanation of social phenomena	Generalization and conformation	Aims both explanation and generalization
2. Sample size	small	Large	Both small and large
3. Amount of data	Large amounts of textual raw data	Relatively small amount of numerical data	Both large and small amounts of data
4. Relationship with respondents	Close one-to-one relationship	Almost no direct relationship	Close one-to-one relationships with some but not with all respondents
5. Frequently used data collection techniques	Semi-structured interviews, easy but costly and time consuming	Large scale surveys, low response rates, less costly and less time consuming	Combines methods based on objectives, more costly and time consuming than the other two methods
6. Frequently used data analysis techniques	Thematic content analysis, tedious and time consuming	Statistical analysis using computer-aided programmes, relatively simple and quick	Combines methods from qualitative and quantitative approaches, takes longer time and costs more
7. Flexibility and standardization	Flexible	Less flexible than qualitative analysis	More flexible than both
8. Research process and data quality	Meticulous record keeping adds value to quality of process and data	Compromises quality of data for standardization	Quality of process and data is considered better than the other two methods
9. Interpretation of results	Lot of interpretation is required	Interpretation is concise due to use of statistics	Interpretation is harder and longer because of the use of both qualitative and quantitative methods
10. Generalizability	In general, generalizability is not an objective	Highly generalizable in general	Generalizability is stronger than in any of the other two methods
11. Triangulation	In general, no triangulation is done	In general, no triangulation is done	Triangulation is done
12. Overall usefulness, assuming cost, time and expertise are not issues	More useful than quantitative methods in understanding social phenomena	More useful than qualitative methods in replication	More useful than both qualitative and quantitative methods in all aspects
13. Term(s) used for quality of research	trustworthiness	rigour	Both trustworthiness and rigour

Note: list of the above issues is not exhaustive and the order does not represent priority.

Unlike quantitative researchers who generally impose a framework of their own on the researched, qualitative researchers see the world of social reality from the perspective of their participants (Holloway and Wheeler, 1996; Guest et al., 2011; Curry et al., 2009). This is called the emic perspective, which means how local people think about their world instead of etic perspective (quantitative research) which is concerned how researchers think what is important in a local context (Holloway and Wheeler, 1996; Harris, 1976; Morris et al., 1999). Etic approach generally depends on brief and structured observations of a large group(s) of

individuals and generalizes results from sample to population. Emic approach, however, focuses on a wide range of observations of a small group(s) and strives to paint an inside picture of the way social reality is created (Orb et al., 2001).

Therefore, the overall aim of qualitative research is to build theory and define new variables, which quantitative researchers test (Shah and Corley, 2006; Press, 2005), using rich and in-depth information from participants' standpoint (Krefting, 1991). Qualitative researchers achieve this aim by understanding lived experiences of people and then represent these experiences as abstracts (Elliott et al., 1999).

In short, qualitative research typically leads to explanation rather than generalization (Payne and Williams, 2005) as it untangles the meanings attached to a given social construct. However, there are three areas qualitative research is criticized. First, small samples lead to no or poor generalization or replication; second, researcher bias guiding to interpretation of raw data based on the researchers' own predispositions (Stenbacka, 2001; Morse et al., 2008; Mays and Pope, 1995); and third, in extreme cases qualitative research can lead to idiosyncratic theory building, i.e., one theory relates to one issue or one case or one individual only (Eisenhardt, 1989). Although qualitative methods contributed to the overall systemization of social research, they did not necessarily replace any existing methods of empirical as well as theoretical research.

Quantitative Social Research

Quantitative social research is about collecting numerical data and analyzing it using statistical methods to explain a phenomenon. Unlike qualitative research which argues that there is no pre-existing reality, quantitative research in its extreme form assumes that there exists only one single reality about a social phenomenon which is not influenced by researchers in any way (Muijs, 2010).

Scholars at the other extreme of the epistemological spectrum believe that reality is socially constructed and researchers play a vital part in its interpretation based on personal and or societal factors such as their own mental models, cultures and politics. However, both Press (2005) and Muijs (2010) believe that the above extreme views are not actually practiced in social research due to two reasons (Eisenhardt, 1989). First, laws of natural sciences, in which all objects behave in the same way to any changes in their environment, are not generally applicable to human beings as different individuals would react differently to the same change in their situations. Second, it will be worthless to produce a piece of research work which is idiosyncratic to one person and is not generalizable or transferable to other people in the same or similar situations.

Unlike qualitative research which is used when little is known or if there is uncertainty about a phenomenon (Cronholm and Hjalmarsson, 2011), quantitative research is used to find cause and effect or the relationships between variables mostly to verify/nullify theory or hypothesis (Creswell, 2002; Teddlie and Tashakkori, 2012; Feilzer, 2010).

While quantitative methods are primarily concerned with numerical data, most social phenomena (such as education, health and organizational performance) do not naturally generate numerical data (Muijs, 2010). Social researchers mitigate these weaknesses by using a number of techniques, instruments or indirect variables such as scales in questionnaires that ask to rate a phenomenon like strongly agreed to strongly disagreed (Muijs, 2010). The use of proxy indicators is another way to generate indirect numerical data to measure a social

phenomenon, such as number of years of schooling and number of trainings attended to measure the level of human capital within an individual (Crook et al., 2011; Hatch and Dyer, 2004). Critics argue that although these measures may provide solutions to social issues to some extent, quantitative researchers over rely on procedures (Jogulu and Pansiri, 2011) and sacrifice quality of information for standardization (Stenbacka, 2001). Moreover, while quantitative research is considered more rigorous because it is relatively easier in quantitative research than in qualitative research to check validity, reliability and generalizability of results (Stenbacka, 2001; Jick, 1979), quantitative researchers tend to miss more by looking at the phenomenon as outsiders than qualitative researchers do as they become part of the research process (Mays and Pope, 1995; Harris, 1976).

Sampling in Qualitative Research

Unlike quantitative research in which large sample sizes are considered important for rigour, qualitative research tends to focus on smaller size samples where the researcher acts as part of the instrument and records information in a natural context to uncover its meaning in a variety of qualitative ways such as description, explanation and exploration (Suter, 2011). Quantitative sampling and data collection techniques, such as random sampling and surveys, are not practical in the qualitative research for a number of reasons including the non-feasibility of researching large samples because of time and cost constraints (Marshall, 1996). The most commonly used sampling methods in qualitative research are snowball (Suter, 2011) and purposive (Suter, 2011; Jogulu and Pansiri, 2011; Tongco, 2007) sampling, or a combination of them. Snowballing is adopted if fewer potential informants are available and if it is expected that these respondents will lead to more or more-relevant informants (Lewis-Beck et al., 2004). In purposive sampling researchers select informants who are considered knowledge experts about the phenomenon in consideration (Tongco, 2007; Basu, 1998; Suter, 2011).

Other sampling techniques, which are used less commonly in qualitative social research, are incidental quota sampling, convenience sampling, intensity sampling, deviant case sampling, maximum variation sampling, criteria sampling and open-ended questionnaire surveys (Bricki and Green, 2007; Bryman and Bell, 2007; Marshall, 1996). While the selection of fewer samples in qualitative research leads to weak generalization of results from samples to population (though this is not the aim of qualitative researchers), they provide the opportunity of analyzing a specific social reality in detail yielding unique insights from rich data (Suter, 2011) which is not possible in quantitative research.

Sampling in Quantitative Research

The most frequently used sampling technique in quantitative research is random sampling which has a variety of variations such as systematic random sampling, stratified random sampling and quota random sampling. The most popular one is systematic random sampling in which each sample is selected from a list of potential respondents by following a random selection method. This type of sampling is adopted when the population is large enough. In case of a small population the whole population can be selected in order to draw reasonably acceptable statistical conclusions. Smaller samples are not useful in quantitative research due to the fact that: response rate is generally low (Newby et al., 2003) and responses less than 100 cannot be used to draw statistically significant results (Shook et al., 2004).

Data Collection in Qualitative Research

The data collection methods available in qualitative research include (but not limited to) ethnography, focus group discussions, open ended questionnaires, unstructured interviews, analysis of videos and photographs, and archival documents analysis. The most commonly used technique in qualitative research is face-to-face semi-structured interviews (Eisenhardt and Graebner, 2007; Press, 2005). Compared to other methods, this method records more and better-accurate data, depending on the research question and objectives, by capturing feelings and body gestures of respondents in addition to what they verbally express (Gilbert, 2008). In this method, a number of open ended questions are asked which give freedom to both the interviewer and interviewee to ask relevant and varied questions and to express feelings and experiences in a relaxed environment (Bricki and Green, 2007; Hollway and Jefferson, 2008; Bryman and Bell, 2007; Guest et al., 2011; Denscombe, 2010; May, 2011; Orb et al., 2001). This method gives freedom to respondents to tell their story in terms of their own lived experiences in their own words, which they may be unwilling or unable to share in an indirect situation such as surveys.

In addition, the one-to-one semi-structured interview process is easy to control as it involves only two people, the interviewer and the respondent, and only one data source at a time (the respondent) (May, 2011; Denscombe, 2010). Although this method is generally more expensive and time consuming than other methods (except unstructured interviews (Zhang and Wildemuth, 2006)), its benefits are greater as it provides the opportunity for the researcher to collect in-depth information during the interview by asking both probing and prompting questions (Denscombe, 2010) which is not possible in most other data-gathering methods. Moreover, without being so close to their respondents and without observing or noting each bodily gesture as well as each word they (respondents) utter, Goffman (1989) believes social researchers will not be able to do a serious piece of research work.

Data Collection in Quantitative Research

Various instruments are used to collect quantitative data including telephone interviews, web-based surveys, postal surveys and structured questionnaires. Each instrument has its own strengths and limitations in terms of time, cost and quality of data. Since most quantitative researchers in social sciences use structured questionnaires for data collection (Newby et al., 2003; Bryman, 2006; Driscoll et al., 2007; Edwards et al., 2002; Jogulu and Pansiri, 2011), they do not have any control or influence over the respondents that leads to low response rates. Researchers use various techniques to increase response rates including, but not limited to, use of pre-notification letters to respondents, post card follow-ups, first class outgoing postage and cash/monetary incentives (Fox et al., 1988; Newby et al., 2003; Edwards et al., 2002). Similar to sampling, data collection methods in quantitative research are also relatively simple (Newby et al., 2003). Therefore, this topic is not further discussed in this review.

Data Analysis in Qualitative Research

In general, data analysis is more complicated in qualitative than in quantitative research because data are buried in the text in most qualitative research (Bricki and Green, 2007). Since most qualitative researchers deal with issues where no or little prior knowledge is available, they tend to adopt inductive analysis (Elo and Kyngäs, 2007) to make sense of the data. The most commonly used qualitative data analysis techniques are: thematic analysis, discourse analysis, descriptive approaches, interpretative phenomenological analysis, grounded theory and narrative analysis (Bricki and Green, 2007; Braun and Clarke, 2006; Graneheim and Lundman, 2004; Arregle et al., 2007).

The specific data analysis technique to be adopted depends on the research objectives and the type of data collected. For example, in an exploratory or explanatory qualitative research in which data are collected using a semi-structured interview technique, researchers may find thematic analysis as a most suitable technique as it is most widely used for identifying, analyzing, and reporting patterns or themes from the data (Braun and Clarke, 2006; Graneheim and Lundman, 2004; Bricki and Green, 2007).

The process of identifying themes by breaking down the textual data into manageable chunks and then coding each of these chunks is called code and retrieve process (Hollway and Jefferson, 2008). Although the process of coding and pattern-building is a tedious job, it helps researchers in identifying rich sources of codes and themes providing basis for interpretation of the data and drawing meaningful conclusions.

Data Analysis in Quantitative Research

Quantitative researchers use a number of statistical data analysis tools to analyze and make sense of quantitative data. These tools include, but not limited to, SEM, LISREL, SPSS, MATLAB, MINITAB, STATA, STATISTICA, SPSS etc. The decision to use a data analysis tool depends on the research objectives and type of data available.

Discussing each of these tools is not in the scope of this paper, however, Structural Equation Modeling (SEM) is discussed here as an exemplar due to the fact that it is widely used in various disciplines including psychology and social sciences (Anderson and Gerbing, 1988), Management Information Systems (Chin, 1998) and Strategic Management (Shook et al., 2004). In other words, the use of SEM is viewed as an appropriate strategy as it is a comprehensive analysis tool for statistical analysis of quantitative data (Anderson and Gerbing, 1988; Suhr, 2006). Therefore, SEM is briefly discussed here as an exemplar of quantitative data analysis.

Unlike many first generation statistical analysis methods; such as regression, correlation and analysis of variance; use of SEM, as a second generation method offers a number of benefits over traditional statistical techniques if applied correctly (Suhr, 2006; Chin, 1998). For example, SEM incorporates observed (measured) and unobserved (latent constructs) variables in a multivariate environment to perform path analytic modeling, it allows researchers to carry out multiple tests to determine the best model fit, it allows to take multiple measurements for latent constructs to resolve multicollinearity problems, it represents complex relationships among several variables in a visual way instead of only describing them in complex statistical statements, and it tests a priori theoretical assumptions against empirical data (Suhr, 2006; Chin, 1998).

In addition, SEM has the unique ability to analyze a number of interdependent relationships in which dependent variables become independent variables simultaneously, it analyzes multiple dependent variables at the same time (Shook et al., 2004) and has excellent prediction and explanatory capability of endogenous (dependent) latent variables in model estimation (Ringle et al., 2012).

Critics argue that SEM is a mathematically complex package which many researchers find difficult to use and to make sense of their data (Chin, 1998; Shook et al., 2004). To address the issues of technical complexities of this as well as other modern statistical analysis

packages future research is required to guide researchers in three areas. First, how to make sure their data meet the assumed multi-variability of normal distribution of indicator variables? Second, how to measure indicators appropriately as weak measures may result in inappropriate modifications to structural models and false findings. Third, what will be an acceptable sample size to assess model fit because larger samples may produce trivial differences and smaller samples may lead to suspicious model fit.

Validity and Reliability in Qualitative Research

Validity and reliability, in other words rigour, refer to the extent whether the object under research has been truly measured and whether the process or method of measurement gives the same results over and over again when repeated by others for similar research objects (Drost, 2011; Stenbacka, 2001). This type of language typically exists in quantitative research because the overall aim of a qualitative research is to explain/explore, rather than to measure, why a social reality is the way it is. Trustworthiness, however, in qualitative research is the equivalent to validity and reliability in quantitative research (Munhall, 2011).

Nevertheless, critics of qualitative research believe that small samples in qualitative research lead to either poor and non-generalizable results (Stenbacka, 2001; Morse et al., 2008; Mays and Pope, 1995) or, in extreme cases, idiosyncratic theory building where each individual phenomenon, case, person or situation needs a theory for its own explanation (Eisenhardt, 1989). In addition to small samples, qualitative research paradigm is mostly criticized for three reasons: First, research bias (due to close involvement of the researcher in the data collection and therefore his/her personal impression and interpretation); second, lack of reproducibility (due to the personal understanding of the researcher as other researchers using the same methods/data may not come to the same conclusion); and third, generalisability (because of large amounts of data from small samples) (Mays and Pope, 1995).

However, admirers (e.g., Stenbacka, 2001; Krefting, 1991) argue that unlike quantitative research in which quality of data is sacrificed for quantity or standardization, qualitative research focuses on small samples to gather a rich set of data which lead to deep understanding of a social phenomenon. This point has been highlighted by a number of scholars (e.g., Britten and Fisher, 1993; Stenbacka, 2001; Payne and Williams, 2005) as they argue that smaller sample size in qualitative research is in fact not a generalizability problem. This is done, as they believe, on purpose for three reasons. First, to include those groups which are disadvantaged or in minority or hard to reach; second, to maximize diversity in order to describe the range of phenomena; third, to go beyond mere numbers, yes/no answers and superficially measured likert scales in uncovering deep feelings based on lived experiences of people. The notion that research bias negatively affects research quality is refuted by Tongco (2007) as she argues that it contributes positively to reliability of the research process and the data. Her argument is significant as it contributes to the debate that quality of the overall research should be considered instead of focusing only on results. This line of argument was echoed by Stenbacka (2001). She argued that the overall quality of qualitative research can be achieved if the research process and methods are sufficiently explained and documented so as to help others to trace the results back to each step of the research in order to have confidence in the overall research.

I argue that the main problem in qualitative research, with reference of validity and reliability, is the use of competing and sometimes conflicting jargons in the literature. For example, Dellinger and Leech (2007) used terms such as truth value, credibility,

dependability, trustworthiness, generalisability, legitimation and authenticity to refer to the overall quality of qualitative research. Onwuegbuzie and Johnson (2006) identified the following five types of validities in qualitative research in order to simplify this concept. (1) descriptive validity (factual accuracy of the research); (2) interpretive validity (accuracy of the interpretation of the data from the respondents' standpoint); (3) theoretical validity (the consistency of theoretical explanation with data); (4) evaluative validity (whether an evaluative framework can be applied to the researched); and (5) generalizability (whether results of the research can be generalised to other contexts, individual, times etc). Mays and Pope (1995) suggested the following six steps to be followed in qualitative research to ensure reliability and rigor as well as to minimize research bias. (1) A systematic and self-conscious research design; (2) accuracy in data collection; (3) a thorough data analysis by involving other researchers and consulting with previous relevant research findings; (4) effective communication with respondents in data collection and with other researchers in interpretation; (5) detailed documentation of the research process; and (6) meticulous documentation of the data and process.

The endeavours made by the above scholars are indeed significant contributions to the literature of qualitative social research but they made the process of selecting methods complicated due to use of conflicting terminologies. Therefore, their efforts are not helpful enough in qualitative social research training and for novice researchers in selecting suitable methods that can lead them in achieving research outcomes effectively in the context of their research questions. This paper does not aim to narrow down the research of methodological improvement, it rather posits that further research is required in this field as the qualitative research tradition is still evolving. Therefore, it needs refinement and it remains somehow under-researched.

Validity and Reliability in Quantitative Research

The issues of validity and reliability are generally less complicated in quantitative research than they are in qualitative research (Onwuegbuzie and Johnson, 2006). It is perhaps due to this reason that the recommendations to improve validity and reliability in quantitative research did not change much during the last half a century. For example, the four steps recommended, in this regard, by Campbell and colleagues in the 1960s has been repeated by others in 2010s (Campbell et al., 1963; Drost, 2011). These four steps are: (1) Statistical conclusion validity - it refers to the fact that if a relation exists between the variables that can be tested statistically. (2) Internal validity - it refers if a causal relationship exists between variables and if the samples are representative and are not biased. (3) Construct validity - it refers to the fact that how well a concept or construct is interpreted into a functioning and understandable reality. (4) External validity - to what extent a causal relationship between concepts or variables is generalisable.

However, some quantitative researchers (Dellinger and Leech, 2007; Onwuegbuzie and Johnson, 2006) in the recent past have focused on three types of validities. They are: (1) content validity - this refers to the fact that whether items on a measurement instrument represented the specific domain which was aimed to be studied; (2) criterion validated - to check if scores from the test correlated to other constructs or if the scores were able to predict future scores to hypothetically related constructs; and (3) construct validity - it refers to the fact if the instrument measured the construct as it was claimed. Dellinger and Leech (2007) particularly argue that in fact construct validity covers all types of validities including measurement-related validity, design-related validity and statistical inference validity. I found

their argument significant due to the fact that construct validity overlaps with all other types of validities and if the construct has been measured and meaning of data has been interpreted properly that would mean other types of validities are covered.

In addition, social researchers have increasingly used a wide variety of computer software programmes in justifying validity and reliability of their research (Guest et al., 2011; Mays and Pope, 1995). This help, however, has been greater in quantitative than in qualitative research. This is because quantitative research deals with numerical data that is easier to manipulate or analyse using statistical software packages such as SPSS, SEM and LISREL. Contrary to this, researchers find it difficult to analyse qualitative data (such as text, pictures, videos etc.) using word processors or other computerised packages, such as Nvivo and Atlas-ti.

Due to the inherent limitations of qualitative and quantitative methods, scholars tend to shift their attention towards adopting mixed methods to maximise research rigour and to minimise various methodological weaknesses which are difficult to avoid if either a qualitative or quantitative method alone is used.

Mixed Methods Research

Although the rise of qualitative social research methods increased our ability to better understand social constructs, researchers increasingly found themselves inclined, specifically since 1990s (Alasuutari, 2010), towards using both qualitative and quantitative methods in the same research. Some researchers (e.g., Symonds and Gorard, 2008) believe that this shift in researchers' attitude was triggered by the categorizations that all numerical research is quantitative and all other research is qualitative. They argue that any research involving both numerical data and other types of data necessitated the birth of mixed methods as a third enquiry paradigm. A similar point was raised by Alasuutari (2010), as he believes that since 1990s the ambition among social researchers to make research more robust than before resulted in the widespread use of mixed methods as a recognized research methodology. Likewise, others (e.g., Brannen and Moss, 2012) posit that mixed methods came to existence due to the potential it offers us to see social relations and complexities clearer by combining methods and by recognizing the limitations that each method has.

Yet there are those who believe that the driving force for the popularity of mixed methods was the concept of triangulation in social research (Symonds and Gorard, 2008; Jick, 1979; Bryman, 2004). Triangulation increases the validity of research findings as it mitigates both the inherent bias associated with individual methods and the possibility of making inappropriate generalizations. Triangulation also offers the opportunity to present multiple findings about the same phenomenon due the deployment of various elements of both qualitative and quantitative methods in the same piece of research.

In practice, mixed methods research generally refers to the processes of collecting and analyzing both qualitative and quantitative data in a single research project (Driscoll et al., 2007; Jogulu and Pansiri, 2011). In other words, mixed methods research involves combining research techniques, methods, approach as well as language from both qualitative and quantitative research traditions in a single research enquiry (Symonds and Gorard).. Creswell and Plano Clark (2007, p. 5) define mixed methods as:

“As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative

approaches in many phases in the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone”.

Similarly, Creswell and Tashakkori (2007, p. 3) offer the following definition:

“... the use of mixed methods means that the studies report both qualitative and quantitative research and include both approaches in the data collection, analysis, integration, and the inferences drawn from the results.”

In the light of the above definitions, this paper recognizes that the use of more than one method in the same research is not a new idea because researchers prior to 1990s did make use of more than one method (Alasuutari, 2010; Brannen and Moss, 2012). However, social researchers since then started using both qualitative and quantitative methods in the same research more frequently than before and used the term mixed methods more assertively than they did in the past (Alasuutari, 2010). The increased use of mixed methods is attributed to its nature. This is a flexible research approach which involves both qualitative and quantitative methods (or their elements) and which is directed by the requirement of the research question instead of what a researcher wants to know or explore (Muijs, 2010; Bronstein and Kovacs, 2013). In mixed methods, researchers have the freedom to use all necessary data collection and analysis tools rather than confining themselves to only one method. Moreover, mixed methods provide more comprehensive insights of a given social phenomenon than either quantitative or qualitative research methods offer (Creswell and Plano Clark, 2007; Creswell and Garrett, 2008). In short, a mixed methods research design is employed when both breadth and depth are required to be looked at or when relationships between variables, as well as meanings of specific social phenomena, are required to be determined and explained/explored.

Benefits of Mixed Methods

As mentioned above, mixed methods research usually provides more rigorous results than adopting either qualitative or quantitative data collection and analysis methods alone (Shah and Corley, 2006; Jick, 1979; Driscoll et al., 2007; Bryman, 2006). This is because most social issues cannot be measured directly nor can they be calculated accurately using direct variables or by adopting either a quantitative or a qualitative research approach. Take the example of the amount and level of human capital in an organization which is the sum total of individual level qualifications, skills, trainings and abilities which are not solely owned by the firm but can be used by the firm in attaining strategic objectives. Although this construct has been researched in the past with the help of a number of proxy indicators or by using indirect variables (Mahsud et al., 2011; Unger et al., 2011; Basu, 1998), no research has ever been able to capture the impact of this socially complex and causally ambiguous construct on individual- and/or firm-level performance using direct variables. Moreover, the continued divide between qualitative and quantitative research methods in social sciences further pushed measurement/assessment of complex social constructs beyond the bounds of possibility. However, it is possible to draw insights about this and other complicated social phenomena by using a combination of qualitative and quantitative research methods.

In addition to adding value to research results, mixed methods research provides important insights that might be missed when only a single method is used and relied on (Cronholm and

Hjalmarsson, 2011). Moreover, use of mixed methods eliminates a number of unnecessary and unproductive controversies between qualitative and quantitative research which are currently present in the literature. For example, as expressed by Press (2005), some scholars on both sides of the divide mistakenly assume that quantitative social researchers presuppose regularity in social behavior similar to that found in natural sciences whereas qualitative social scientists supposedly believe that all social events are idiosyncratic therefore, any kind of replication is not possible. This article adds to her assertion: while these extreme views might not exist in practice, no research is fully generalizable or replicable because of social dynamics; and no single truth is possible in social research because some generalization is always possible as one individual's experience can match, to some extent, to other individuals' experiences in a similar situation under similar conditions. Because of these reasons, mixed methods in social research is a better choice than using either qualitative or quantitative methods alone in explaining complex social phenomena in a meaningful way (Gioia and Thomas, 1996; Jick, 1979). Moreover, researchers have the unique opportunity to build and test theory at the same time in the same research by mixing qualitative and quantitative research methods as traditionally theory building happens in qualitative research whereas theory testing is the domain of quantitative research (Shah and Corley, 2006; Curry et al., 2009).

Those who criticize the mixed methods paradigm base their critique on the perceived epistemological and empirical underpinnings of mixed methods (Symonds and Gorard, 2008). They argue that since the combination of elements from the two traditional paradigms in social research (qualitative and quantitative) forms a third paradigm (mixed methods) which is philosophically considered pragmatic, therefore it inhibits further development of new and more effective social research methods. However, some researchers counter argue that since social researchers bring their own predispositions to their research, it is not possible to be totally subjective or objective in collecting, analyzing and interpreting their data without having some sort of inherent bias no matter what methodologies they adopt (Symonds and Gorard, 2008; Charmaz, 2014). Similarly, some researchers argue that such extreme views, being either a pure positivist or interpretivist, are not actually practiced in social research for at least two reasons. First, laws of natural sciences are not applicable in social sciences and that an idiosyncratic piece of research does not provide any useful insights about how a given society/culture operates (Press, 2005; Muijs, 2010). Second, interpretation is required in quantitative research and counting can be adopted as a way of analysis in qualitative research (Bazeley, 2002; Curry et al., 2009).

In view of the significance of the above counter arguments, it makes sense to say that mixed methods, as a social research paradigm, is neither a proxy nor it is a duplication of any of the two traditional methods. Furthermore, the use and presence of mixed methods does not hinder the potential of further developing and refining social research methodologies. This is because the widespread use of qualitative methods since 1960s and mixed methods since 1990s did not cause demise of quantitative and qualitative methods respectively. Therefore, contrary to Symonds & Gorard's (2008) suggestion any new developments in social research, including but also beyond and above mixed methods, is not likely to cause death of mixed methods any time soon.

However, while it is undisputed that mixed methods yields more in-depth and more reliable research results than relying on either qualitative or quantitative methods alone (Denzin, 2010), how and when methods should be mixed remains a question in the literature. A variety of mixed methods designs, which scholars have used in the past, are given next.

Types of Mixed Methods

Methods can be combined in different ways depending on the research objectives (Tashakkori and Teddlie, 2010; Teddlie and Tashakkori, 2012; Onwuegbuzie and Johnson, 2006; Bronstein and Kovacs, 2013) as well as researchers' interests and experiences. A brief outline of different mixed methods in social research is given below.

Concurrent: qualitative and quantitative data are collected and analyzed independently but concurrently.

Sequential: qualitative and quantitative data are collected and analyzed separately in a sequence, one after the other.

Conversion: data are converted or transformed from one form to another (e.g., quantifying qualitative data) and then analyzed.

Parallel: both types of data are collected but analysis is done in an integrated way in a parallel design.

Fully mixed: in a fully mixed design, qualitative and quantitative approaches are mixed in an interactive way at all stages of the research.

Transformative: in this approach qualitative and quantitative data collection methods are chosen based on data requirements and changes are made in the research process during the project when and as required.

Sequential Mixed Methods

While methods can be mixed in a variety of designs, evidence suggests that a sequential mixed method is the most widely used design in mixed methods research (Driscoll et al., 2007). This argument is strengthened by the analysis of 232 journal articles by Bryman (2006) in which he found that more researchers used sequential mixed methods than all other forms of mixed methods. Furthermore, Onwuegbuzie and Johnson (2006) posited that the two approaches which preponderate mixed methods research are actually variations of sequential mixed methods. Researchers can collect and analyze one type of data in the first phase that may direct and inform the type of data to be collected and analyzed and the type of method to be adopted in the second phase. This approach is also called non-fixed and emergent mixed methods (Bronstein and Kovacs, 2013). Alternatively, researchers can mix the two research approaches (qualitative and quantitative) at each phase of the research in a sequential way to inform the next phase.

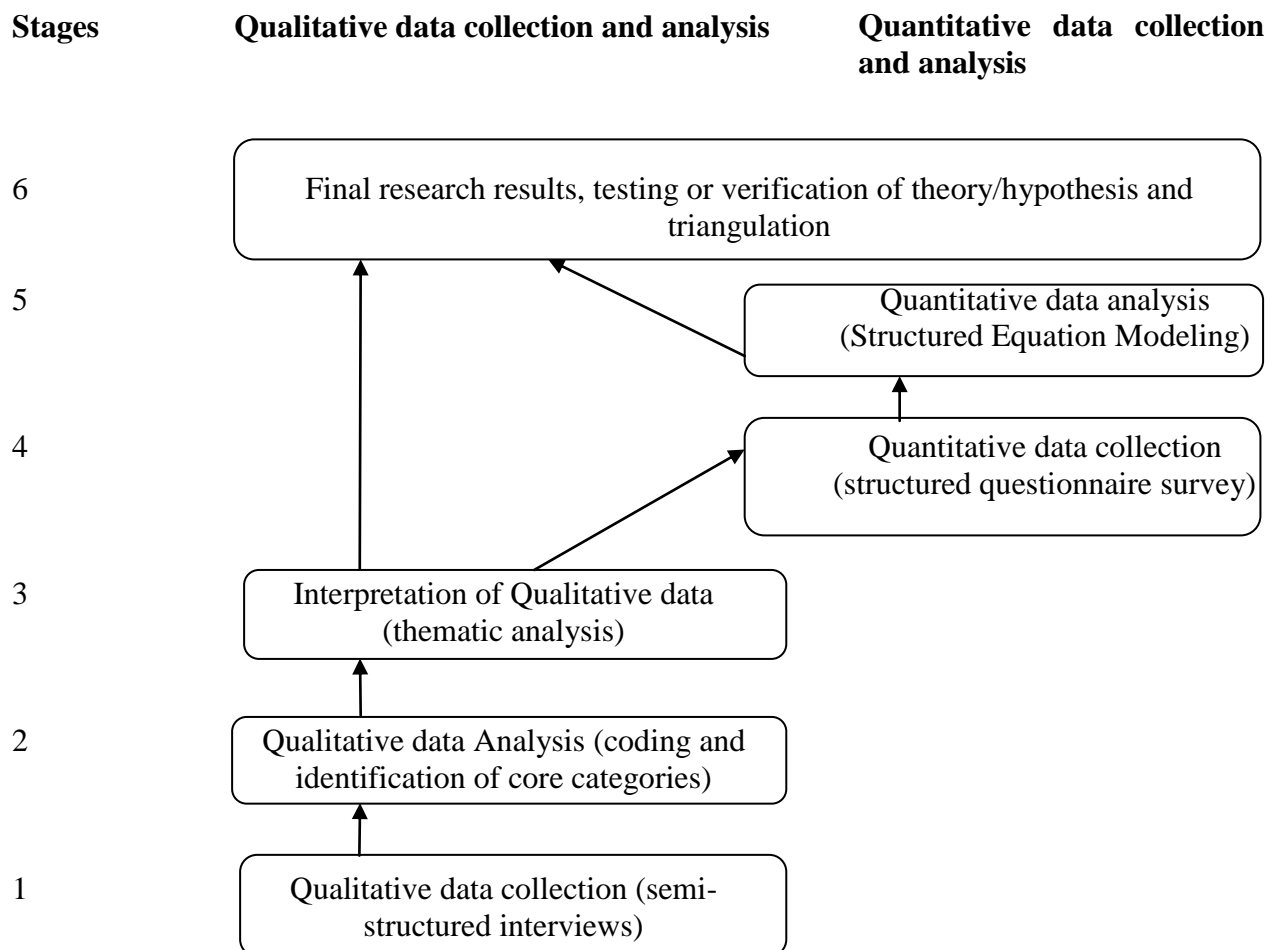
Whatever tradition is adopted, mixed methods in general and sequential mixed methods in particular, though based on the research question(s) and context, offer a great deal of confirmation and validation of the research process and results (Onwuegbuzie and Johnson, 2006; Dellinger and Leech, 2007; Jick, 1979; Curry et al., 2009). Explanation how each of these types of mixed methods work or how ought they should be adopted is not in the scope of this paper. However, a typical sequential mixed methods design, in which qualitative data is collected and analyzed before quantitative data is collected, is conceptualized in Figure 1 as an exemplar.

The main reason to choose this exemplar is that this type of mixed methods is the most widely used mixed method design in social research, as given above. The second reason is that it matches the author's own ontological and epistemological position: knowledge about a social reality can be better accessed and understood from different angles and by adopting both qualitative and quantitative data collection and analysis tools and techniques in the same

social enquiry. I also believe that there can exit more than one reality about a given social construct and each reality can be correct in its own right as well as in the context where it exists and where it is explicated. All these realties can also be fallible at the same time.

On a practical level, this type of mixed methods design is particularly useful as the codes and themes indentified during the qualitative phase provide basis for variables and constructs for the quantitative phase of the research, even though some scholars (Bazeley, 2002) have questioned that this type of mixed methods design may not represent a fully integrated mixed methods. However, their own recognition that this is the widely used mixed methods design in practice and their use of the word ‘integrated mixed methods’ is indicative of this design being a useful mix of methods. In addition, while I accept that this is not the only design of mixed methods, and also it may not be the best form of mixed methods, this type of design is used by more researchers than any other forms of mixed methods. This is due to the fact that this type of mixed methods approach provides the opportunity for researchers to collect and analyze data and judge each method without diluting the other (Brannen and Moss, 2012).

Figure 1: A typical example of Sequential Mixed Methods Research Design



Sequential mixed methods technique also offers the process of triangulation as data are collected from different sources about the same phenomenon or at different points from the same source. Such multi-lens and multi-angle data can be merged into a single point or compared with each other to obtain more reliable outcomes than results derived from data

collected using a single source or at a single point in time and/or space. This is because what people say about a situation often differs from what they would do if they were faced with the same situation (Goffman, 1989; Press, 2005; Charmaz, 2004). In short, triangulation reduces uncertainty and enhances confidence and thus provides a rationale for use of mixed methods (Jick, 1979; Bryman, 2004). To illuminate this argument further, I now discuss four exemplars where sequential mixed methods were used as a social research design.

In their study, Driscoll et al. (2007) collected quantitative data using a survey followed by qualitative data using a semi-structured interview technique. They then transformed qualitative data into quantitative data before final analysis. With the help of embedded qualitative data they were able to explain and augment many contradictions they found in the quantitative data. Similarly, Jogulu and Pansiri (2011) analyzed two doctoral research projects which used sequential mixed methods data collection and analysis techniques. In both projects, the doctoral researchers collected and analyzed quantitative followed by qualitative data using in-depth semi-structured interviews to explain quantitative results. By mixing methods, the doctoral researchers were able to expand their statistical data interpretation as the qualitative data enabled them to elaborate quantitative results and address the research questions more accurately which otherwise might have not been possible if only a single research method was used. Similarly, Jick (1979) used a mixed methods approach in his PhD research in which he found that mixing methods was a stronger research design in finding out employees' anxiety in uncertain and apparently insecure situations. He collected and analyzed quantitative data using a survey design followed by qualitative interview data, as well as archival data collection from within the company reports/registers, which he used to triangulate the quantitative survey analysis results.

Likewise, Gioia and Thomas (1996) also used sequential mixed methods, where they collected qualitative data by interviewing all three members of the top management of a large public university several times. They interviewed top management team members of other similar institutions too and analyzed 11 out of a total of 25 in-depth interviews. Based on the core categories identified, they developed a questionnaire which they sent out to a much larger sample for quantitative data collection. This technique can be particularly useful if the social phenomenon at hand is an abstract and if it is difficult to know whether the right questions were asked in the first phase of the research. By adopting a sequential design, they were able to reflect the emerging themes from the first phase in the questionnaire which helped them in further analysis using statistical tools and thus in confirmation and triangulation of their results. This type of mixed methods design can strengthen the overall research results and improve trustworthiness of the research process and its results (Shah and Corley, 2006; Jick, 1979; Gioia and Thomas, 1996).

Validity and Reliability in Mixed Methods Research

The issues of validity and reliability in mixed methods research are not the same which researchers face in qualitative and quantitative research as separate methods. The process of combining qualitative with quantitative methods although creates complementary strengths, it also results in non-overlapping weaknesses (Onwuegbuzie and Johnson, 2006; Dellinger and Leech, 2007). Complementary strengths refer to the value added to the overall research when qualitative and quantitative methods are mixed, whereas nonoverlapping weaknesses refer to the difficulties of: analysing qualitative textual data (also called problem of representation); and making credible, transferable and confirmable inferences (also called problem of legitimisation or integration).

As qualitative and quantitative research approaches complement each other (Britten and Fisher, 1993), the concept of trustworthiness can somehow be compatible when appropriate methods are employed, such as sequential mixed methods. Moreover, scholars adopting mixed methods have a degree of leverage over qualitative and quantitative researchers because use of mixed methods minimizes research bias (a criticism raised by positivist paradigm) and the risk of survey questionnaires not being uniformly understood by respondents and researchers (a criticism raised by interpretivist paradigm) (Mays and Pope, 1995). In addition, employing verification and self-correcting strategies at each stage of the research process in mixed methods, which are considered measures of validity and reliability improvement (Morse et al., 2008), may further contribute positively to research rigour. These strategies, coupled with meticulous documentation of the research process, can add value to the overall research as readers will be able to verify the research process should they wish so. Stop.

To be specific, the following two paragraphs shed some light on how validity and reliability can be dealt with in a sequential mixed methods approach. The hypothetical explication given below is based on the conceptual framework given in Figure 1.

In the first phase of the research, qualitative data are collected from purposefully selected individuals using a semi-structured interview technique, which provides a rich source of text data leading to the identification of codes, categories and themes directed by the research question. These codes, categories and themes would provide basis for interpretation of lived experiences of the participants. This method of data collection is particular useful as it is non-forcing (Stenbacka, 2001) and in which participants voluntarily share their real life experiences in their own words. In this example (Figure 1), the qualitative thematic data analysis would be followed by a close-ended questionnaire-based survey in which variables and constructs will be defined based on the identified codes and themes. By doing so, both internal and external validity can be increased as samples would be representative of the population and assessing/measuring the phenomenon would not be flawed. In addition, the second phase would compliment and triangulate results from the first phase. In order to improve overall research quality, other researchers may be involved and asked to critically evaluate each stage of the research and provide feedback, which can be considered and acted upon.

Moreover, this type of mixed methods research can also achieve analytical generalization (Stenbacka, 2001) as well as intermediate type of limited generalization (also called *moderatum* generalization) which are acceptable norms in qualitative research as well as in mixed methods (Payne and Williams, 2005). This point has been elaborated by Cronholm and Hjalmarsson (2011) as they believe that in a mixed methods approach, quantitative data are used to add precision to qualitative analysis results to verify or falsify empirical grounded hypotheses, which is essentially the approach of sequential mixed methods.

Discussion and Conclusion

Although the divide between the two traditional research methods (qualitative versus quantitative) resulted in a rich amount of scholarly investigation, the two traditions seem to remain as apart as ever. As a result, social researchers started using mixed methods increasingly as an alternative approach (Caruth, 2013) which overcomes many of the weaknesses of qualitative and quantitative methods.

Although no method is better or more accurate than any other methods in social enquiry as the use of a particular method depends on the nature and objectives of the investigation, there are greater benefits of using mixed methods than relying on either qualitative or quantitative methods alone. Nevertheless, scholars need to develop some form of consensus in terms of when mixed methods should be adopted and how they should be mixed. This is because a number of mixed methods are discussed in the literature without providing any clear guidelines of how and when to adopt them keeping in mind the nature of the issues and the overall research goals. In other words, methodological literature does not provide a step-by-step guide by which researchers (especially novices and students) would be able to choose data collection and analysis methods most suitable for their research.

Having said that and building on past published research (Onwuegbuzie and Johnson, 2006; Bryman, 2006; Jogulu and Pansiri, 2011), this article argues that mixed methods, specifically sequential mixed methods, contribute more towards overall research quality than other methods.

With respect to limitations in the existing literature and possible future directions, it is found in this review that some scholars have suggested various steps to be taken to improve quality of research mostly from qualitative and to some extent mixed methods research standpoints. Most of such evidence in the literature is either confusing due to jargons used or simply scant. The lack of scientific evidence of methodological appropriateness and understanding of social research methods, especially among novice social scientists and students, always results in difficulty to adopt research methods suitable for their unique research questions and contexts. Future theorizing and empirical investigation is required to further the field of methodological appropriateness in order to expand our understanding about the role data collection and analysis methods play in conducting trustworthy and reliable social research.

In particular, future research is required in the following areas three areas. (1) While research suggests that mixed methods produce more accurate and reliable results than qualitative and quantitative methods, there is little evidence of when and how to combine methods keeping in mind the nature of the research problem and the available resources. Addressing the above issue is of paramount importance due to the follow three sub-questions. (i) the classification of methods without elaborating of why and how boundaries are drawn between them and what will be the possible consequences in case if these boundaries are violated (Symonds and Gorard, 2008)? (ii) What are the underlying reasons whereby researchers tend to adopt sequential mixed methods than other designs? (iii) Whether or not samples be repeated in mixed methods from one phase to another as repetition of samples may add value to data due to respondents' knowledge about the research and non-repetition may contribute to control research bias and over exposure of the respondents. (2) While qualitative research can produce high quality research results, there is hardly any research suggesting a step-by-step approach in adopting and executing qualitative research methods which are practicable and understandable by scholars including novices and students. (3) As it is assumed SEM is widely used in quantitative research, evidence is scant to address limitations of SEM. i.e., how to make sure quantitative data meet the assumed multi-variability of normal distribution of indicator variables, how to measure indicators appropriately and what will be an acceptable sample size to assess model fit when SEM is used for data analysis.

This article has some limitations. The author's predisposition is that quantitative social research stresses more on standardization of research process whereas qualitative and mixed

methods research emphasis more on the quality of data and process than protocols. Therefore, quantitative methods are typically less complicated than qualitative and mixed methods are. Part of this presumption is that quantitative research is less dynamic than qualitative and mixed methods social research. Future social scholarship can shed some light on this assumption so as to contribute to the whole debate of methodological appropriateness in social scientific enquiry.

In summary, building on published research this review draws three conclusions. First, although quantitative research is simple and is capable of producing superficially robust results which can be generalised from samples to population, it does not necessarily provide better or more valid explanations than qualitative research does. Second, while qualitative research is complex and offers poor generalisation, it has the ability to capture deep meanings of a social phenomenon thus explains social realities more accurately. Third, all research is selective as no researcher can capture the factual truth of events by following either a qualitative or quantitative tradition. In any case, quality of any research is an important issue which can be assured by collecting sufficient, accurate and rich data to explain the social phenomenon in consideration as well as to help readers to form an independent assessment of the results. Such a broad objective is more likely achievable when appropriate mixed methods are adopted. Although past research shows that use of sequential mixed methods is more popular among social researchers than other forms of mixed methods, there are gaps and limitations in using mixed methods in general and sequential mixed methods in particular. In order to narrow the gaps and overcome the limitations, this article highlighted the need of a dialogue among social researchers to further the debate of methodological appropriateness with the aim to widen the choice of adopting suitable data collection and analysis methods in the context of research questions, as well as physical and social conditions.

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