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Choosing Appropriate Designs and Methods for Social Science Research

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Abstract
This study is made compelling by the seeming confusion surrounding the choice of appropriate research designs and strategies, to best answer the research questions. Many upcoming researchers and graduate students dread this phase of their academic endeavors due to the clouds surrounding the selection of appropriate methods of study. I have herein reviewed emerging strategies and approaches which underpin current investigations. The philosophical landscapes, the ontologies of the researcher which informs the understanding of worldviews are intrinsically tied to the choice of methods and designs. I have in this study looked at the various methods of research designs and strategies with the strands which align squarely within the philosophies undergirding the investigation. The factors that inform methodological approaches and constraints inherent in each have been discussed, Emerging patterns challenging the fixated traditional methods of investigations have been demonstrated. It is hoped that this piece offers a useful contribution to growing body of knowledge in scientific research methods. The study is a narrative essay.

Keywords: *Ontology; Philosophical Assumptions; Triangulation; Worldviews*

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I. Introduction

Research Design is the guide and a blueprint to researchers on how the research is to be carried out. Frankfort-Nachmias and Nachmias (2008) held that research design enables the inquirer to proffer solution to problems and guides him through the various research stages. A typical research design delineates the method of inquiry, data collection strategies, measuring instruments, steps to ensure validity of design and reliability of instruments, sampling method, and data analysis method, reasons for mixing methods, triangulation of approaches and strategies, and the specific approach adopted for the studies. An investigator is to show the alignment between the selected research method and the problem of the study.

The coherence of the questions emanating from the problem and the ability of the design to source answers to the question, determines the choice of the design and strategies. According to Creswell (2009) research designs are plans and procedures for the researcher to follow in conducting the research.

Strands of Research Approaches

Creswell (2009) advanced three broad types of research design: the qualitative method, the quantitative method and the mixed method. The choice of any of the design is aligned with the philosophical assumptions, epistemologies and the worldviews undergirding the inquiry. The researcher's ontology plays a mediating role in shaping the worldview which underscores the choice of design.

Within the three broad methods highlighted above, researchers will choose from any specific approaches which answer the question and address the research problem. Creswell (2009) held that research design displays the plans and procedures necessary to finding answers to research question. It involves strategies, data collection methods, analysis, and interpretation. According to Creswell (2009) a qualitative investigator has five approaches in conducting the research. They are phenomenology, case studies, ethnographies, grounded theory, and narrative essay. These are termed qualitative strategies which underscore the conduct of qualitative research design. Within the quantitative framework survey research, experimental design and quasi-experimental design are available from which researchers may choose. Creswell (2009) argued that a mixed method research may be conducted as sequential mixed methods, concurrent mixed methods, or transformative mixed methods.

A Case for Single Case Design

Single-Case experimental design is the study of participants or cluster of participants which may be undertaking in repeated measures at different times. Smith (2012) made a strong case for the single-case as a rigorous experimental design which enables the researcher to gain deep insight into the characteristics of the participants. Horner et al (2012) also claimed that there is under-utilization of single-case design by scholars and

researchers who prefer group designs. Smith (2012) argued that SCED "provide a rigorous methodologically sound alternative method of evaluation" (P. 1). According to Horner et al (2012), the analysis of the single-case findings should embrace both visual and statistical methods. Horner et al (2012) appraised the rationale for the move to include statistical analysis to support the traditional visual analysis protocol for single-case approach. Horner et al (2012) argued that emerging trends make statistical analysis a compelling addendum to the single-case research. Horner et al (2012) argued that for the single-case to receive acceptability by practitioners there is a need to reappraise its logic, its process and rules for visual analysis and the process for integrating statistical analysis and visual analysis used in a single-case design.

McCann and Landess (2010) held that Single-Case design is useful for appraising the relationship between variables.

According to Horner et al (2012) a single-case design exhibits strong rigor and is in no way inferior to group design but they failed to display and compare the distinctive characters of each design for analytical purposes. Smith (2012) advocated the introduction of randomization component to SCED, so as to improve the methodological rigor and enhance the internal validity of the design. Smith (2012) contended that SCED serves as a viable alternative to group design with large sample size. Smith (2012) identified a particular strength of SCED to be the examination of interventions effectiveness. The review by Smith (2012) bothered on current guidelines and reporting standards, the procedure and selection criteria underpinning the use of SCED.

Mixed Methods Vs Multiple Methods

Mixed method is the fusion of qualitative and quantitative design and strategies in other to tap on the synergy arising from such combination. Certain pragmatic problems of study cannot be thoroughly investigated using a singular method of inquiry. Bernardi (2011) argued that mixed methods enable a deeper analysis and understanding of the ego-centered social network inherent in transnational families. According to Creswell (2009) a mixed method approach follows a pattern of qualitative exploration to quantitative analysis or quantitative analysis to qualitative exploration. Bernardi (2011) is a strong voice in the use of mixed method as emerging research design in a pragmatic world.

Kettles et al (2011) argued that the philosophical underpinning guiding the adoption of qualitative and quantitative methods, attempts at splitting ideological stances into false dichotomies. According to them, when faced with pragmatic problem such splitting is unrealistic. Fuhse and Mützel (2011) contended that one of the most challenging and rewarding areas of sociological networks is using quantitative and qualitative methods of research in dealing with construction and enactment of networks, definition and negotiation of individual's identities and changing the formation of networks. They held that the adoption of different research techniques enables researchers to view network from a different perspective for a more accurate and understanding of complex social structures.

According to Fuhse and Mützel (2011) the integration of qualitative and quantitative designs yields the synergy for deeper understanding of the phenomenon and the statistical rigor from the analysis of variables of interest. They argued that combining the methods is useful in relation to the various aspects of networks. Chamberlain et al (2011) offered a different dimension in the understanding of multiple methods as opposed to mixed methods. According to Chamberlain et al (2011) mixing qualitative and quantitative methods emanate from the clash of epistemologies. They held that epistemology, theoretical framework and methodology must be firmly aligned for research to yield meaningful outcomes. Chamberlain et al (2011) however argued that the clash of epistemology as the starting point for eluding research. Chamberlain et al (2011) posited that multiple methods should not be equated with the notion of triangulation, but the benefit of multiple methods is that it provides different insights on the topic of investigation. .

According to Chamberlain et al (2011) the differing results indicate the different sides of the stories. Chamberlain et al. (2011) argued that the benefits accruing from a pluralistic perspective are enormous and justifies the time and money invested. Creswell (2007) argued that there are five main approaches from which a qualitative researcher may choose. One of the problems arising from integrating methods is that of different results from different analysis. Chamberlain et al (2011) held that rather than a problem, this is one of the benefits of adopting multiple methods. They are the case-study approach, phenomenological approach, narrative essay approach, grounded theory approach and ethnographic approach. Chamberlain et al (2011) argued that the practice in which researchers are restricted and required to state specific, identify, and define approaches imposes constraints and impedes diversification in answering the research objectives.

Arguing for the use of mixed method design, Chamberlain et al. (2011) held that multiple methods enable researchers to investigate complex social problem. They held that to secure maximum benefits from using multiple methods, there is the need to align it with the broad philosophical assumptions. One obvious concern of adopting pluralistic approach is that of cost and time. For researchers working under constraint of time and within tight financial budgets, multiple methods may not be very appealing.

Mixed method design is an emerging design involving blending of the two traditional methods of research. Wisdom, Cavaleri, Onwuegbuzie and Green (2012) argued that sound mixed method research helps in the understanding of Health services by offering a more illustrative picture of health or summaries that either the qualitative or quantitative approach alone. Wisdom et al (2012) explained that the adoption of mixed method do not lower the established standards of the qualitative and quantitative methods. Researchers are to ensure that both approaches conform to their established standards before integration them as a single design. Wisdom et al (2012) posited that mixed methods draws on the strength of both qualitative and quantitative methods in a single approach thereby enjoying the synergy of triangulation. The rigor of mixed method is therefore evaluated by the extent to which both qualitative and quantitative components adhere to their standards.

According to Crandell et al (2011) methodological distinction between qualitative and quantitative research designs could be interpolated to produce a stronger basis for analysis and better understanding of the phenomenon. The interpretation of the qualitative result offers a wider scope for understanding the phenomenon. Kettles et al (2011) posited that the philosophical framing the design of qualitative and quantitative methods, splits ideological stances into false dichotomies. The dichotomy between qualitative and quantitative methods does not reflect the realities of certain pragmatic problems. Such splitting on the basis of diverging philosophical assumptions is unrealistic.

Mixed method is the scientific answer to addressing pragmatic issues not amenable to post-positive, constructivist, advocacy, or participatory worldviews. Kettles et al (2011) argued that mixed method enables initial exploration and identification of variables, taxonomies and theories, and construct for further testing of theories. According to Kettles et al (2011) mixed method makes up for the shortcomings of qualitative explorations in providing adequate understanding of the problem as the former provides a complete picture and evidence for generalization and in-depth views of participants perspectives. Kettles et al (2011) posited that researchers adopting mixed method should possess adequate knowledge of and be grounded in the qualitative and quantitative strategies. Kettles et al (2011) clearly prescribed steps to implementing a mixed method design. Key definition of terms and phrases was carried out, and Kettles et al (2011) discussed the philosophical basis for mixed method research and the various pragmatic scenarios justifying the use of mixed method design.

The first criteria set forth by Wisdom et al (2012) were the assessment of the methodological components. They were the internal validity and credibility for quantitative and qualitative findings; the external validity and fittingness for quantitative and qualitative findings; reliability and dependability for quantitative and qualitative findings; and objectivity and conformability for quantitative and qualitative findings. These are in tandem with Creswell's (2007; 2009) checklist for evaluating rigor in qualitative and quantitative inquiries. The need to set the basic standard for conducting research using mixed method design is receiving attention of scholars and researchers in the Social Science. According to Fuhse and Mützel (2011) the integration of qualitative and quantitative designs yields the synergy for deeper understanding of the phenomenon and the statistical rigor from the analysis of variables of interest. They argued that combining the methods is useful in relation to the various aspects of networks. Kettles et al (2011) defined mixed method as the combination of qualitative and quantitative methods, within the framework of diverse philosophical assumptions, for a better understanding of the problem of the study. Mixing method is being courted by researchers and scholars as the best form of investigation in addressing the ever dynamic social phenomena.

Fuhse and Mützel (2011) argued that both quantitative and qualitative designs are vital in sociological network research. The role of qualitative research according to Fuhse and Mützel (2011) is primarily in giving meaning to networks through actions, orientations, the symbols, scripts and schemes. According to Fuhse and Mützel (2011) over reliance of researchers on quantitative method in analyzing constructs do not yield sufficient understanding of the phenomenon of study. Kettles et al (2011) also expressed concern for the absence of strong theoretical foundation underpinning the use of mixed method design by researchers. They held that before adoption of mixed methods, researchers need to be grounded in both qualitative and quantitative methods and have assessed that neither of the methods is sufficient to answer the problem of the study. Kettles et al (2011) argued that mixed method research is preferred when one approach is not adequate to address the research problem. The process of mixed method approach allows for exploration and statistical quantification of variables. In other to promote standardization, researchers adopting mixed method should be driven by the pragmatism of the problem of the study. Kettles et al (2011) posited that mixed method is the ideal choice when an experimental design is not adequate, or the qualitative approach needs some statistics to provide a better understanding. Monaghan et al (2011) argued that mixed methods strategies enable understanding of the effect of treatment on the dependent variables and interventions outcomes.

Criteria for Research Quality Evaluation

Bleijenbergh et al. (2011) developed independent criteria for evaluating the quality of practice-oriented research. They argued for the development of distinct criteria for evaluating the internal and external validity and reliability of practice-oriented research. The study by Bleijenbergh et al. (2011) puts to end the confusion

surrounding the reliance on theory oriented research criteria to evaluate the qualities of practice base research. According to Eckermann et al (2010), application of VOI as a tool to prioritize research varies across various disciplines due to funding constraint and allocation. Value of Information is defined as a "systematic decision-analytic approach for aiding decision makers in assessing whether there is enough evidence to support new therapies, optimally designing research studies and setting research priority for health technology assessment (HTA)" (Eckermann et al, 2010:700).

According to Eckermann et al (2010) VOI methods enables the assessment of cost effectiveness, the expected value of research and to help efficiently design and prioritize research. The study opened space for future methodological discuss on how to improve the integration of VOI methods as tools for funding decision making. With the use of a Delphi study employing methodological experts, Bleijenbergh et al (2011) formulated the evaluation criteria for practice based research. Eckermann et al (2010) sparked a new and interesting topic of discuss in the evaluation of research findings through the value of information it communicates. Crandell et al (2011) held, "research synthesis is the actual fusion of qualitative and quantitative evidence" (P. 654).

The use of Bayesian data augmentation enabled Crandell et al (2011) to deal with incidence of missing data. Crandell et al (2011) argued that research synthesis is often riddled with cases of missing data which can be addressed through data augmentation. The Bayesian method helps to input the value of the missing data and analyzing them as if it were complete. The Bayesian method therefore, substitutes values for the missing data into the data set by re-estimating the parameters of the distribution. Crandell et al (2011) argued that the Bayesian thinking allows parameters to enjoy statistical distribution. Crandell et al (2011) incorporated both qualitative and quantitative evidences in the same step instead of the traditional approach of importing prior information from qualitative method.

This study by Bell et al. (2010) was predicated on the need for an article which will guide quantitative researchers in the dissemination of their findings in a cohesive, detailed and informative manner. McCann and Landess (2010) recognized the paucity of research methods in evaluating treatment-outcomes for depression, contending that available literature gave undue credence to randomized controlled trials. They held that over reliance on any of the approaches could impede the development of emerging methods in the evaluation of treatment options for depression. The dearth of adequate research in the use of hypnosis and its effectiveness in the treatment of depression warranted the study by McCann and Landess (2010). They identified two known methods for addressing missing data. The study by Bleijenbergh et al (2011) identified the criteria of internal validity, verifiability, comprehensibility of the results, acceptance of the results and holism as the basis for assessing the quality of practice-based research. According to Bleijenbergh et al (2011), criteria for external validity are not necessary for evaluation of practice-oriented research because rather than seek to generalize the result of the research, practice-oriented research is focused on solving practical problem.

The Bayesian method helps to input the value of the missing data and analyzing them as if it were complete. The study described a Bayesian method to be applied for synthesizing result from both methods. Criteria for empirically supported interventions are receiving the core attentions of stakeholders. According to Horner et al (2012) the rise in the evidence-base practice movement necessitated documentation of standards for assessing research treatment as empirically-supported.

McCann and Landess (2010) reviewed research methods for evaluating the impact of hypnosis on depression, noting that the traditional method such as randomized controlled trials has many shortcomings in assessing the potential effect of hypnosis on depression. McCann and Landess (2010) contended that randomized controlled trials, single case design and benchmarking are the most suitable methodologies suitable for appraising hypnosis treatment of depression. Bell et al. (2010) held that research questions must clearly be a demonstration of steps to addressing the problem stated in the study. Bell et al (2010) stated that well stated research design and procedures enable valid inferences to be made from investigations. Bleijenbergh et al. (2011) argued for the development of distinct criteria for evaluating the internal and external validity and reliability of practice-oriented research. According to Bleijenbergh et al. (2011) a practice-oriented research involves research targeted at solving a practical problem or that which leads to strategic decision making. The aim is to provide a decision-based evidence to cause a change in a desired direction.

In reporting their findings, Bell et al (2010) argued that discussion of quantitative report should be carried out in a separate section from the actual report section. According to them, the discussion section ought to provide researchers personal insight into the report, the interpretation of findings, rejection or confirmation of hypothesis and recommendations for future researcher. A practice-based research uses group modeling, policy Delphi and gaming while expert–based research adopts system dynamic modeling, Delphi study and gaming approaches of investigation. Bleijenbergh et al (2011) argued that expert-based research derives inputs from existing knowledge and information as opposed to traditional social science research which makes use of data., but Plonsky and Gass (2011) argued that qualities of a good research practice include calculating and reporting instrument reliability (e.g. Cronbach's alpha), and randomization of participants to groups.

According to Plonsky and Gass (2011) experimental researchers generally minimally conform to APA of recommendation with respect to the employment of various statistical procedures. In evaluating the use of research methods in SLA, Plonsky and Gass (2011) argued that several weaknesses in reporting practices abound. They held that there are widespread inconsistencies in reporting practices with regard to "exact and relative p-values" absence of standard deviations to accompany the means, t-test or ANOVAS without t or f values, small sample size, non-use or unfamiliarity with power analysis.

They argued that adaptive intervention enables the researchers to change intervention along with individuals' characteristics and changing behavioral needs. Nahum-Shani et al (2012) posited that adaptive intervention offered a better yield compared to fixed interventional approach. Nahum-Shani et al (2012) advanced the argument for adopting sequential multiple assignments randomized trial (SMART) to address the research question.

Eckermann et al (2010) defined value of information (VOI) methods as a "systematic decision-analytic approach for aiding decision makers in assessing whether there is enough evidence to support new therapies, optimally designing research studies and setting research priority for health technology assessment (HTA)". (P.700). According to Eckermann et al (2010) VOI methods enables the assessment of cost effectiveness, the expected value of research and to help efficiently design and prioritize research.

The use of Bayesian data augmentation enabled Crandell et al (2011) to deal with incidence of missing data. According to Crandell et al (2011) a research synthesis of existing research results is usually associated with higher cases of missing data-set than those of primary research. They posited that there are two known methods for addressing missing data. Crandell et al (2011) argued that the Bayesian data augmentation and complete case analysis are the two ways of handling the issue of missing data. The complete case analysis is done using SPSS software. Crandell et al. (2011) however, ruled out the complete case analysis arguing that it is riddled with two major disadvantages. According to Crandell et al (2011) the research result emanating from complete case analysis can be misleading if complete observation is not available. They held further that complete case can be biased if missing values does not occur randomly

The quantitative components of the mixed method must therefore, exhibit the highest level of reliability and validity while the qualitative components with ensure credibility of the investigation. Wisdom et al (2012) discussed the merits of mixed methods as follows:

- Mixed method enables the triangulation of data collection methods and analysis by converging different methods or one method to corroborate the finding about a phenomenon.
- When there is a need for further elaboration of result from one method to inform the adoption of another method.
- The need to use result from one method to inform another.
- When there is a need to use one method to discover paradoxes or certification from another method.
- When there is a need to diversify or expand the research base of the study.

II. Quantitative Methods

A quantitative method is a deductive approach for investigating relationships between variables of interest. According to Creswell (2009) quantitative method flows from a post-positivist worldviews, aimed at testing or verifying theories or explanations. He held that quantitative method employ a closed-ended questionnaire. The method is used to relate and measure variables by stating assumed relationship hypothetically. The researcher then gathers the necessary data, analyze them to confirm or reject the hypothesis. The result is used to generalize or make inferential generalization of findings to the entire population from which samples were drawn.

The strength of quantitative design lies in the robust statistical analysis and the researchers' ability to make confidence generalization of findings. According to Bell et al (2010) researchers must have in view the broader scientific community as the focus of their inquiry. Plonsky and Gass (2011) posited further that quantitative investigators often ignore the importance of summarizing findings through adequate Meta – analysis.

Testing for the significance of the null hypothesis is enhanced by the growth in statistical testing. Plonsky and Gass (2011) argued that qualities of a good research practice include calculating and reporting instrument reliability. Nahum-Shani et al (2012) compared SMART relative to other experimental approaches such as factorial design, randomized trial with multiple groups, a standard randomized controlled trials, and a single – stage – at – a time experimental approach.

A quantitative research aligns with the post-positivist philosophical world-view. Creswell (2009) argued that a quantitative researcher advances theories by evaluating the relationship between variables. The quantitative researcher test existing theories using the deductive approach. The inquiry collects data and analyzes them to test assumed relationship between the variables. This gives the researcher the confidence to reject the theory, formulate new one, or reinforce existing one of same. In a quantitative design, extensive statistics is used to analyze data before arriving at empirical findings. Creswell (2009) highlighted the structured format a quantitative

research is reported, beginning from the introduction, review of literature and theory, methods, to discussion of results.

Control and randomization are the peculiar features of a quantitative design. The researcher exercises control over extraneous variables, in other to rule out alternative explanations. She/he generalizes findings to the larger population, randomizes participants and minimizes chances of bias, promotes objectivity, and builds strategies for enhancement of validity. Quantitative design is framed within theoretical lens. Creswell (2009) defined theory as "a set of interrelated constructs, definitions, and propositions that present a systematic view of phenomena, by specifying relations among variables with the purpose of explaining natural phenomena" (p 51). A quantitative design is an approach which examines the relationship between constructs or variables. The inquirer advances theories to be tested so as to provide explanations for answers to research questions. She/he relates variables and validates the stated hypothesis while making predictions about the outcome.

Common approaches adopted by a quantitative researcher may be either a survey or experimental designs. Creswell (2009) held that a survey researcher is states the purpose of the study, identify the population and determines the sample size, selects the appropriate survey instrument. Variables are stated in their order of relationship, the research questions and/or the hypothesis are stated and the method of analysis and the interpretation of data defined. Valid generalization flows from the researcher's ability to control extraneous variables and randomly assign of participants. A quantitative method may be conducted using survey method, a full experimental or quasi experimental design.

Survey is a method enables large population to be sampled by the researcher. Survey researcher makes up for the difficulty of using observation to generate enough samples necessary for valid generalization. Frankfort-Nachmias and Nachmias (2008) held that certain phenomenon cannot be directly accessed through direct observation by researchers themselves, so they have to sample the opinion of a large population who observed the phenomenon. Such responses are used to test the stated hypothesis necessary to answer the research question. There are three major types of survey which are the mail questionnaire, personal interview, and telephone interview.

The main advantage of mail questionnaire is that it is cheap to administer to large and widely dispersed respondents. Mail survey ensures the anonymity of respondents and minimizes bias because it reduces interactions between the investigators and the participants. Mail questionnaire ensures that the respondent is confidentially veiled thereby assuring anonymity particularly in sensitive and embarrassing issues that may prejudice them. Large sample size is critical to make valid generalization of findings to the entire population. Mail questionnaire enable wide coverage which is vital for reaching large participants of the populations. Frankfort-Nachmias and Nachmias (2008) argued that mail questionnaire is a preferred choice when participants need time to reason out their responses. Mail questionnaire ameliorates the cost of sampling large population and is the most effective method of data collection involving large sample size.

The advantages of mail questionnaire notwithstanding, there are glaring drawbacks to its use as a data collection strategy. Frankfort-Nachmias and Nachmias (2008) argued that the wordings of the mail questionnaire pose a lot of challenges to researchers as ambiguity could result in misunderstanding by the respondents. As opposed to interviewing method, the mail questionnaire does not afford the investigator the opportunity to probe beyond the answers given by the respondent. Questionnaire in a quantitative research is more structured and close-ended than the interview method which is more popular with qualitative open-ended and inductive. There is no guarantee that the targeted respondents actually fill out the questionnaire as some may delegate the job to subordinates or friends who may not be grounded in the phenomenon of study.

The main disadvantage of mail questionnaire is that the researcher is not in control of the actual delivery of the mail questionnaire. The questionnaire may end up in the hands of unintended persons who may provide wrong answers. According to Frankfort-Nachmias and Nachmias (2008) a serious limitation of mail questionnaire is low response rate as opposed to a personal interview which has a higher response rate. A large portion of the respondents may fail to complete and return the questionnaire. A low response rate can impede the researcher's ability to generalize the findings of the study to the entire population. The literacy levels of the respondents accounts for some degree of low response rate. Attempts by researchers to involve an interpreter could defeat the advantage of anonymity associated with questionnaire.

Experimental design is that arm of quantitative method used to study the population by randomly selecting samples for treatment. The feature of true experiment is control and randomization. Creswell (2009) argued that researchers randomly assign participants to two groups for treatment and comparison purposes. The thrust of experimental design is to identify and position variables for analysis of their relationships and the form of such relationship. The Independent variables predict the change in the dependent or outcome variables.

Randomization of variables guides against bias and enable sampled stand an equal chance of receiving treatment. It is only when participants are randomly selected that valid inference and generalization can be made to the larger population of the study. In other, to rule out the effects of moderating and mediating variables on the outcome, the experimenter controls for such, and do all things possible to recognize them. Experimentation is a

rigorous research design which randomly assigns variables to study groups to determine the effects of treatment on dependent variables. It was Osuala (1993) who posited that the key attributes of experimentation are randomization and control.

He argued that once participants have been randomized to experimental and comparison groups and control of contending explanatory variable achieved then the ability to generalize is secured. Osuala (1993) identified limitation in the use of the experimental design, holding that certain social attributes of human character such as race and gender cannot be controlled and randomized. Creswell (2009) posited that in experimentation, the researcher administers treatment to one group, and then measures the outcome against that of those which did not receive the treatment to determine the effect of the treatment. One issue researchers contend with is ethical consideration in the use of human participants. Osuala (1993) held that, with the introduction of multivariate analysis to account for the multiple predictors, the application of experimentation to human behavior has become a possibility.

The limitations of experimental design in providing an explanation to certain human social attribute necessitated the introduction of Quasi-experimental design. In quasi-experimental design full randomization of participants is compromised, rather some form of convenient sampling strategies is adopted. In a true experimental design randomization of participants enhances valid generalization. Creswell (2009) argued since randomization may not be possible in many instances the experimenter will resort to a design called quasi-experiments. He held that naturally emerging groups are not amenable to manipulation thereby true experiment is impeded. This is because human social attributes are not easily manipulated; therefore a quasi-experimental design is the best option for quantitative researchers.

A non-random assignment of treatment and control groups is the common strategies in quasi-experimental design. Creswell (2009) argued that quasi-experimental designs could take the form of non-equivalent control group designs, simple group interrupted time-series design, or control group interrupted time-series design. In a true experiment, the researcher randomly assigns the participants to treatment groups. In quasi-experimental design randomization is not done, but the investigator utilizes the experimental and control groups. All quasi-experimental design differs from true experiment because of the absence of randomization.

Qualitative Methods

Qualitative method is an inductive approach to investigate a phenomenon, aimed at gaining a deeper understanding by deriving meanings from the participants' views. According to Creswell (2009) a qualitative inquirer draws from constructivist, advocacy, or participatory philosophical assumptions. A qualitative investigator gathers data by collecting participants meaning and study the context or setting of participants. He brings with him personal values and views to the inquiry and makes interpretations based on data generated from the field of study. A qualitative research employs open-ended interview protocols to source data, which is analyzed for emerging themes and categories. The inquirer collaborates with participants to cause positive social change to take place. Patton (2002) argued that rather than being restricted to any of the qualitative approaches, a researcher may choose to blend different approaches to inform better understanding of the given phenomenon. A blended approach is not to be confused with mixed method which involves the integration of the qualitative and quantitative strategies.

Blended Approach

A blended approach is the application of some strategies of the quantitative or qualitative approaches within the same design. For example, a qualitative inquirer may cultural ethnography in a study of case study. A quantitative inquirer may also employ quasi-experimental designs employing cross-sectional, single-case longitudinal approaches. Monaghan et al. (2011) argued that qualitative data augments quantitative data in evaluating interventions. They further posited that qualitative data can highlight areas necessary for refinements within the study and shows the way for future research emphasis.

Multiple methods enable researchers to investigate complex social problem which cannot be sufficiently investigated using either the qualitative or quantitative methods. A mixed method is the adoption of both qualitative and quantitative methods to proffer answers to research questions, but multiple method as discussed by Chamberlain et al (2011) is the integration of various qualitative approaches to answer the research question. Chamberlain et al (2011) argued that the practice in which researchers are restricted and required to state specific, identify, and define approaches imposes constraints and impedes diversification in answering the research objectives. They are the case-study approach, phenomenological approach, narrative essay approach, grounded theory approach and ethnographic approach.

According to Chamberlain et al (2011) mixing qualitative and quantitative methods emanates from the clash of epistemologies. Chamberlain et al (2011) posited that multiple methods should not be equated with the notion of triangulation, but the benefit of multiple methods is that it provides different insights on the topic of investigation. Chamberlain et al (2011) held that complex social science and psychological problems can better

be address by adopting more than one approach of qualitative method. Chamberlain et al (2011 enlarged the scope of discuss in the use of qualitative research method, approaches and possible integration of different approaches. Chamberlain et al (2011) offered a different dimension in the understanding of multiple methods as opposed to mixed methods.

Selecting Research Designs

Selection of specific research design is guided by the research problem and epistemologies undergirding the research problem. To ensure valid inference and confidence generalization of research findings, investigators are to hold in focus the alignment between the research problem and the selected design.

The intrinsic value of an article is measured by the utility derived from it by readers. To this extent an article is worthless if it does not extend or add to knowledge or contributes to building the body of knowledge. Bell et al (2010) provided 10 points recommendation to guide quantitative researchers in the conduct of their inquiry. Bell et al (2010) set forth the following 10 recommendations as a general guide for quantitative researchers:

- To consult statistician when in doubt.
- To write abstracts concisely.
- To specify the research question in the introduction.
- To provide relevant participants' information.
- To write articulate and well organized result in tandem with the research question.
- Provide discussion which adequately interprets the research findings.
- To discuss the measuring instruments, its reliability and validity.
- To discuss the sampling procedures adopted.
- To discuss the statistical analytical procedures adopted.
- State the limitations, implications and conclusions of the study.

Bell et al (2010) stated that a well stated research design and procedure enable valid inferences to be made from investigations. Nahum-Shani et al (2012) advanced argument for adopting sequential multiple assignments randomized trial (SMART) to address the research question. According to Nahum-Shani et al (2012) the adoption of SMART, enables the researcher to use the experimental design for the construction of high-quality adaptive interventions.

III. Conclusion

The choice of research method should be done with due consideration to the alignment of the research purpose and research problem. The statement of the problem will clearly indicate which research design is most appropriate. I have therefore carried out a detailed annotation of the quantitative research with all known strategies and designs, the qualitative research with its strands and the mixed methods and its strategies. A brief comparison is made between the mixed method and the multiple methods. A contrast is made between the two with the later indicating the blending of the traditional approaches and triangulation of diverse strategies to address complex research problem. The study equally reviewed article on research quality rubric. It is a modest contribution to growing voices on scientific research methodologies.

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