

# Research Design: A Review of Features and Emerging Developments

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## Abstract

Research design entails a process or template of finding definitive answers to research problem and questions. In this attempt a researcher employs two major types of research design; qualitative and quantitative. In the construction of research design the researcher is expected to bear in mind the features in both the qualitative, quantitative and the combination of the two (mixed) methods. The paper discusses and argues that developments in the area of ethical issues have profound effects on research design construction and implementation. It went further to emphasize threats to research design especially in the use of qualitative design method and explains the importance and set back of the use of internet to compliment research design process.

**Keywords:** Research Design, Developments, Features, Review

## 1.0 Introduction

Research design entails a process of finding a definitive answer to research questions. In an attempt to do so, a researcher may employ two major types of research design; qualitative and quantitative. Creswell (2008) describes “qualitative research as an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem, which builds a complex, holistic picture, analyses words, reports detailed views of informants and conducts the study in a natural setting”. While McMillan and Schumacher, 1993 describe quantitative research design as a process, which in contrast adopts a positivist philosophy of knowing the emphasised objectivity by using numbers, statistics and experimental control to quantify phenomena. In general, the task of defining the research problem and formulating the research questions to the issues that relate to what, where, when, how much and why concerning an enquiry or research study constitute a research design.

Various scholars have defined research design in different ways that attempt to say that research design is a comprehensive plan and procedure that provides answer to the research question. Kerlinger (1978) says it is a total plan that connects the conceptual research problems to the pertinent empirical research. Polit et al (2001) defines research design as “the researcher’s overall for answering the research question or testing the research hypothesis”

In a more decomposed form, Research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with frugality. The parts of research design are; sampling design which deals with the methods of selecting study sample from the universe, operational design deals with the technique and procedure of sampling, observational design is based on the conditions under which the observations are to be created and statistical design is on how the information and data gathered are to be analysed. The probability of success of a research work is greatly enhanced when the “beginning” is correctly stated or defined as a precise statement of goals and justification. Having accomplished this, the sequential steps necessary for writing a research plan and then successfully executing the research is involved in a research design.

In the process of designing a study, either qualitative or quantitative, researchers need to consider what ethical issues might occur during the study and plan how these issues need to be addressed in its design. In addition to ethical issues, two additional points considered in this paper are threats to research design and the use of internet in the construction of research design. A common incorrect conception is that these issues only arise during data collection process. It is pertinent to mention that they come up too during several phases of the research design process because they are ever expanding in scope as inquirers become more sensitive to the needs of participants, sites, stakeholders, and publishers of research.

This paper intends to address these issues being an important and evolving aspect of research design especially in a developing economy. The rest of the paper is structured as follows: section two is on the description of the three major types of research design, section three discusses features while sections four and five is on developing issues and conclusion respectively.

## 2.0 Types of Research Design

Research design for a study depends on the type of study and the purpose of enquiry being undertaken it is not given but constructed by the researcher. Research design ventures can be categorised under two broad groups:

qualitative and quantitative and perhaps the third method is the combination of the two methods called the mixed method. The other classifications which can fall under any of these methods are; descriptive, explanatory or analytical, exploratory, historical, predictive types and experimental.

### **2.1 Qualitative Research Design**

Burns and Grove, (1999) describe a qualitative approach as “a systematic subjective approach used to describe life experiences and situations to give them meaning”. Parahoo, (1997) states that qualitative research focuses on the experiences of people as well as stressing uniqueness of the individual while Holloway and Wheeler (2002) refer to qualitative research as “a form of social enquiry that focuses on the way people interpret and make sense of their experience and the world in which they live”. Based on this views researchers use the qualitative approach to explore the behaviour, perspectives, experiences and feelings of people and emphasise the understanding of these elements. Thus this is a study of what and why subjectively.

These definitions implies that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them (Denzin & Lincoln 2005). This method of research design entails a detailed exploration of a topic of interest in which information is collected by a researcher through case studies, ethnographic work, interviews, and so on. Inherent in this approach is the description of the interactions among participants and researchers in naturalistic settings with few boundaries and ultimately resulting in a flexible and open research process. These unique interactions imply that different results could be obtained from the same participant depending on who the researcher is, because results are created by participants and researcher in a given situation.

### **2.2 Quantitative Research Design**

Quantitative research examines the relationships between and among variables and the numeric description of trends of data so as to provide answers for the research questions and hypotheses. Quantitative methods have a long history, dating to at least the 1930s, that has produced strong professional norms that impact research activities, such as the criteria used to make decisions about the kinds of studies and results likely to be published (Bryman, 2007).

Definitions of quantitative research design are complicated by the fact that this term is often used to identify the experimental design reflecting the arrangement of independent and dependent variables associated with data collection. Older categorizations of experimental designs tend to use the language of analysis of variance in describing these layouts—for example Trochim and Land (1982) defined quantitative research design as the glue that holds the research project together. A design is used to structure the research, to show how all of the major parts of the research project—the samples or groups, measures, treatments or programs, and methods of assignment—work together so as to address the central research questions. From sample results, the researcher generalizes or makes claims about the population. Also, in an experiment, investigators may also identify a sample and generalize to a population.

### **2.3 Mixed Method Design**

Mixed methods research combines qualitative and quantitative methods in ways that draw on the strengths of both traditions of inquiry; it is a clear step away from the boundaries and practices of those traditions, especially those linked to quantitative methods. Johnson and Onwuegbuzie (2004), defines mixed methods research as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study. Mixed methods research is also an attempt to formalise the use of multiple approaches in answering research questions, rather than restricting or constraining researchers' choices (i.e., it rejects positiveness in stating opinion).

It is an expansive and creative form of research, not a limiting form of research. It is inclusive, pluralistic, and complementary, and it suggests that researchers take an eclectic approach to method selection and the thinking about and conduct of research. This definition highlights the potential value of mixing multiple elements of qualitative and quantitative methods, as well as the potential complexity of mixing the two methods.. Caracelli and Greene (1997) identified three major uses of a mixed methods design; testing the agreement of findings obtained from different measuring instruments, clarifying and building on the results of one method with another method, and demonstrating how the results from one method can impact subsequent methods or inferences drawn from the results.

In sum, the mixed methods approach offers a collection of flexible research designs that seem well suited to support rigorous examinations of promising ideas. Creswell (2004) draw on the strengths of qualitative and quantitative methods to enhance inquiry in ways unlikely to occur with singular applications of these methods. Still, it is important to emphasize that mixed methods design continues to face a number of significant challenges (Tashakkori, 2009).

## **3.0 Features of Research Design**

The identification of a problem and formulation of the research questions is the starting point of a research design based on these two crucial steps the researcher can move on to make the research design that attempts to

answer the research question. A good research design minimizes bias and maximizes the reliability of the data for the study. More often one design is not applicable to all studies therefore in constructing the design the following features are pertinent.

### **3.1 Features of Qualitative Research Design**

The features listed and described below are characteristic of qualitative research design

- ❖ Goals
- ❖ Multiple Process Approach
- ❖ Researcher's role
- ❖ Natural Setting
- ❖ Complex reasoning through inductive and deductive logic.

#### **3.1.1 Goals**

One of the goals of qualitative research is centred on the understanding of a social phenomenon from the participant's points of view. It enables "the collection and presentation of detailed information about an individual participant or a small group of participants, frequently including the accounts of subjects. Thus, people's individual and collective social interactions, beliefs, thoughts and perceptions are analysed and described in the study.

#### **3.1.2 Multiple Process Approach**

Researchers study participant's perspectives using interactive strategies (observation and interviews) and non-interactive strategies (use of documents). Research strategies are flexible, responsive and on-going (Pole & Lampard 2002). Typically an emergent design is used and the researcher makes decisions about data collection strategies during the study (McMillan & Schumacher, 1993). The researcher therefore, refrains from assuming the role of the expert. Instead the participants are the experts and interaction with participants dictates an evolving design.

#### **3.1.3 Researcher's role**

Qualitative researchers become immersed in the situation, past or present, and in the phenomenon being studied. This type of research is grounded in the German term *verstehen*, which means empathetic insight (Bhaskar, 1989 as cited by Cherry, 2000). This occurs through the researcher's participation in a research role or through historical empathy with participants in past social events (McMillan & Schumacher, 1993). Researchers collect data themselves through examining documents, observing behaviour, and interviewing participants. They may use an instrument, but it is one designed by the researcher using open-ended questions. They do not tend to use or rely on questionnaires or instruments developed by other researchers. Qualitative researchers typically gather multiple forms of data, such as interviews, observations, and documents, rather than rely on a single data source. Thereafter, they review all of the data and make sense of it, organizing it into categories or themes that cut across all of the data sources.

#### **3.1.4 Natural setting.**

Qualitative researchers often design data collection in the field at the site where participants experience the issue or problem under study. They do not bring individuals into a lab (a contrived situation), nor do they typically send out instruments for individuals to complete, such as in survey research. Instead, qualitative researchers gather up-close information by actually talking directly to people and seeing them behaving and acting within their context. It is in this natural setting that researchers have face-to-face interaction with them over time for the purpose of gathering information that are eventually analysed.

#### **3.1.5 Complex reasoning through inductive and deductive logic.**

Qualitative researchers in their design build their patterns, categories, and themes from the "bottom up," by organizing the data inductively into increasingly more abstract units of information. This inductive process involves researchers working back and forth between the themes and the database until they establish a comprehensive set of themes.

It may also involve collaborating with the participants interactively, so that they have a chance to shape the themes or abstractions that emerge from the process. Researchers also use deductive thinking in that they build themes that are constantly being checked against the data. The inductive-deductive logic process means that the qualitative researcher uses complex reasoning skills throughout the process of research.

### **3.2 Features of Quantitative Design**

Quantitative design has a number of features but one distinguishing factor from qualitative research is the quantification of the aspects of social life. And the fact that it has a distinctive epistemological and ontological position suggests that there is a good deal more to it than mere presence of numbers. Features of qualitative research design are as listed and described below.

- ❖ Measurement;
- ❖ Causality;
- ❖ Generalization.

### **3.2.1 Measurement**

In the design of qualitative study, emphasis is on collecting and analysing information in the form of numbers for example ratios and interval. This is collecting scores that measure distinct attributes of individuals and organizations based on the procedure of comparing groups or relating factors about individuals or groups in experiments, correlational studies, and surveys.

Measurement also requires that the design in its structure or framework indicates the time frame(s) in which data will be collected or how and when the data will be analysed using quantitative methods and the exact number of groups that will be involved (e.g., a quantitative method involving experimental research with a between-subjects approach and a pre-and post-test control group design).

### **3.2.2 Causality**

In quantitative research the focus is on how and why of phenomenon. In view of this the design emphasizes on the relationship and causality of variables of study. Researchers want to explain the causes of relationship by examining it. The design therefore must often categorize variables into dependent and independent variables to reflect the tendency of thought in terms of causes and effect. It is the relation between one variable and the other which explains that changes in the independent variable is partially responsible for the changes in the dependent variable. This is an important feature of quantitative research design because researchers are expected to generate through their design findings that which allows for causal interpretations in the end results.

### **3.2.3 Generalization**

Generalization is a constituent feature of qualitative design because the outcome of the study must be able to infer that findings can be used to describe the behaviour of a phenomenon beyond the confines of a particular context i.e the sample must be representative of the population. In view of this the design for sample must be unbiased and representative of the population of study. Sample selection must not be peculiar or unique to any subset or group of the population so as to engender generalization of the results of sample with respect to the population.

## **4.0 Issues on Research Design: Evolving Developments**

Research design process is continuous. This means that the initial plans for qualitative research design cannot be tightly prescribed, and that all phases of the process may change and be re-worked during the field work when data is being collected. For example, the questions and its design may change, the forms of data collection may be altered, and the individuals studied and the sites visited may be modified during the process of conducting the study. We discuss some evolving issues in this section of the study.

### **4.1 Ethical Issues**

Ethics are considered to deal with beliefs about what is right or wrong, proper or improper, good or bad (McMillan & Schumacher, 1993). Sequel to this, qualitative researchers need to be sensitive to ethical principles because of their face-to-face interactive data collection, an emergent design and reciprocity with participants in the execution of the research. In spite of this, researchers working in the academia enjoy a number of important freedoms and privileges – the principle of academic freedom (UNESCO, 1997) - which are essential to maintain the independence of the higher education research community.

This includes freedom of inquiry and the right to disseminate their findings, freedom to challenge conventional thought and the opportunity to conduct research on human participants with public monies, trust and support. This is especially so in developed economies. However, researchers and institutions must also recognise that such freedom carries with it significant responsibilities, including the need to ensure that research involving social and medical aspects of human participants meets high scientific and ethical standards. Respect for human dignity is a cardinal ethical principle underlying research ethics and is intended to protect the interests and the physical, psychological or cultural integrity of an individual.

Within the design of any study it is important that researchers make sure that potential harm to participants is reduced to the lowest possible level, whether such harm is physical, psychological or social in nature. Researchers must also acknowledge that, when experimental designs are adopted, some participating members may act as controls and so not receive a potentially beneficial intervention. This should be taken into account in the consent process. In addition, the findings of the research must be recorded in such a way that participants could not be identified and appropriate codes and pseudonyms were used when individual statements were quoted. This is especially so in social research involving vices and a description of its causes.

### **4.2 Research Design Threats**

All research designs are subject to bias and design threats which can adversely affect the internal validity (i.e., accuracy) and external validity (i.e., generalizability) of study results. Bias enters the research design process as a result of researcher preconceptions or behaviour and subject behaviour. Researcher preconceptions can include beliefs, stereotypes, prejudices, cultural incompetence among others. Either researchers or subjects can behave (intentionally or unintentionally) in such a manner that can distort study findings. An experiment which is internally valid is one where the behaviour of and or changes in the dependent variable is due to the independent

variable and not due to moderating variables or study design defects (Schwab, 1999).

An internally valid study allows a researcher to assert that his or her findings and/or conclusions are certain and permit study replications. The specific internal design threats operate independently on the dependent variable, apart from the independent variable. Design decisions relating to sampling may have a significant impact on the meaning that can be attributed to the findings. The size of the sample must therefore be considered and justified to ensure that it is sufficient to provide valid and generalizable results. Where the research is designed to enhance understanding, as in the case in some qualitative studies, this must be satisfactorily explained.

The research design largely depends on the nature of the research question(s) and/or hypothesis(es) to be tested, care must be taken to ensure that these are appropriate. The design, in turn, will determine the methods of data collection to be used. A number of ethical problems can arise in determining data collection techniques, for example in studies that are reliant on covert methods of data collection (e.g. participant observation); such approaches should be used only in rare circumstances where data simply cannot be collected in any other way.

Similarly, within any interview, researchers must demonstrate their awareness of the power relationship that may exist between themselves and their participants and take steps to overcome it. In respect of unforeseen needs, clear plans must be in place to address particular needs that may arise during the course of any research but which may lie outside the researcher's knowledge, skills or expertise, bearing in mind the need for confidentiality and the subject's permission must be obtained before disclosing any information to a third party.

#### **4.3 Using internet as a means of communicating research design**

The internet technology provides an inexpensive mechanism for conducting surveys online instead of through the postal mail (Weible and Wallace, 1998). In consideration of the use of internet the costs per response decrease significantly as sample size increases (Watt, 1999). According to Lazar and Preece, (1999) electronic surveys are becoming increasingly common and research comparing electronic vs. postal surveys is starting to confirm that electronic survey content results may be no different than postal survey content results. However electronic method provides a strong advantage of speedy distribution and response cycles (Yun & Trumbo, 2000).

The construction of an effective design and use of paper-based surveys could be translated into electronic formats although electronic surveys have distinctive technological, demographic and response rate characteristics that affect how they should be designed, when they can be used and how they can be implemented. This is as a result of the fact that questionnaire screen design is more complex to understand by all and sundry. To use the electronic design to collect data, it must be developed in Hyper Text Mark-up Language (HTML), supporting scripting and database language. Initially technical issues inhibited the use of Web-based surveys, but new software and Internet related technology appear to be mitigating many of the technical limitations (McCoy & Marks, 2001).

Other technological, demographic and response characteristics that affect how they should be designed, when they can be used and how they can be implemented also include subject privacy and confidentiality, sampling and subject solicitation, distribution methods and response rates and survey piloting are critical methodological components that must be addressed in order to conduct sound online research ( Dorine, Blair and Preece 2003).

Using the Internet to conduct quantitative research presents challenges not found in conventional research. But our opinion is that the use of paper-based surveys could possibly translate into electronic formats. However, we express a reservation that electronic designs have distinctive technological, demographic and response characteristics that affect how they should be designed, when they can be used and how they can be implemented.

#### **5.0 Conclusion**

The purpose of a research design is to maximise valid answers to a research question in the execution of a design plan. Consequently, a properly drawn research design request that the researcher ensures a holistic rather than a partial plan for the study. Such plan should not be based on the type of data or method of data collection alone but on a compressive detailed plan of how to successfully generate a topic to the final part of report writing.

It is important for research design to bear in its construction the potential issues that may arise in collecting data, especially through interviews and observations. Researchers need to seek permission to conduct research on-site and convey to gatekeepers or individuals in authority how their research will provide the least disruption. Finally, in the present time of increasing use of World Wide Web as a tool for communicating qualitative and quantitative research design methods, researchers should embrace design methods that can enhance data collection through the internet without losing sight of ethical consideration.

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