

Empirical application of research design in management sciences

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ABSTRACT

This paper examined the guidelines and procedures for conducting research design in management sciences. The objective of the paper is the empirical demonstration of the application of research design. The secondary method of data collection in the form of content analysis of documents, records, reports and projects was adopted as research methodology. Also, 10 undergraduate student's projects were selected from the Faculty of Management Sciences, University of Abuja as case study. At the end of the study, the research findings revealed that researchers who are supposed to demonstrate the mastery of research design techniques practically end up defining the concept of research design by various scholars in the field of management sciences without adopting a single research design. Also, most investigators failed to adopt appropriate research designs that are capable of addressing the stated research problem or determine the target population and the nature of data collection/analysis of instruments. Similarly, many do not know, when and why a particular research design is suitable or appropriate for a particular study. On the whole, the study recommended that researchers should not only study to acquire knowledge on the meaning, types and procedures for the adoption of a research design but they must make frantic efforts to know why, how and when a particular research design is the most appropriate for a particular study.

Keywords: Research, research design, management sciences.

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INTRODUCTION

Research is a process of discovering new facts or obtaining additional information about a given phenomenon. It equally involves validating or invalidating existing facts, theories, laws, models, paradigms and approaches. A researcher may decide to complement the works of other scholars or begin a fresh study with the aim of solving identified problems. In other words, research is a systematic, coherent and sequential way of data collection, analysis and interpretation with a view to making dependable conclusion and useful recommendations (Ujo, 2004). It is in the light of the numerous benefits inherent in research undertakings that the field of management and social sciences considered research as one of their core subject.

One of the cornerstones for the conduct of a successful research is the use of appropriate research design. The findings of a research are considered reliable and objective when suitable research design is used. The use

of other components of research work without the complementary role of research design will lead to manipulation and lack of clear direction. Research design is a plan or blueprint specifying how data relating to the research will be collected and analyzed (Obasi, 1999). It provides the procedural outline for the research. In the same vein, a research design offers the researcher with the necessary framework for tackling a particular research problem and helps in the proper delineation of the scope and limitations of the research.

According to Obasi (1999) research design takes care of such practical problems as the selection of objects for the experimental and control group, how observations are made, the type of statistical instrument to be used for data analysis and interpretation, the way variables are to be manipulated and how the extraneous variables should be controlled. Therefore, this paper intends to examine the justification for the adoption of a particular research

design in a given study.

Objective of the study

The objectives of this paper are to:

- i) Examine the concept of research and research design
- ii) Assess the typologies of research design
- iii) Determine the characteristics of a good research design
- iv) Identify the components of a research design
- v) Empirical demonstration of the application of research design

METHODOLOGY

The secondary method of data collection in the form of content analysis of documents, records, reports and projects was adopted in this paper. This is not unconnected with the fact that numerous scholars in the field of management and social sciences have made meaningful contributions on the subject matter of research design. By and large, a critical assessment of selected ten undergraduate student's projects in the Faculty of Management Sciences was made with a view to pointing out wrongful ways of stating a research design before suggesting measures that can be taken to write the wrong.

CONCEPTUAL ANALYSIS

In line with academic tradition, it is quite imperative for a scholar intending to navigate a field of study to review the opinion of experts on the conceptual meanings of certain terms considered fundamental to the issue under consideration. Therefore, the following terms shall be conceptualized based on the views of notable authorities in the field.

Research

The concept of research has been defined from different perspectives by numerous scholars in the field. It is quite interesting to note that the opinions of authors are greatly influenced by their various disciplines. Some considered research from a scientific point of view while others defined it from a social science perspective. Those in the field of natural sciences normally define research from experimental angle but the behaviouralists tend to perceive research from a non-experimental direction.

According to Osuala (2001), research can be defined as the process of arriving at dependable solutions to problems through planned and systematic collection, analysis and interpretation of data. In the same vein,

Muhammed (2005) conceived research is an organized inquiry that aims at providing information for solving identified problem. He went further to say that research is defined as a systematic and objective search for new knowledge of the subject of study and/or application of knowledge to the solution of a novel problem. However, Kerlinger (1977) considered research from a natural science point of view as "the systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among natural phenomenon. In the same view, Eboh (1998) defined research as "the process of systematic inquiry by which we increase our knowledge of how things are, why things are the way they are and how they might be changed. It is an intensive and ordered study of a subject aimed at discovering new facts and testing scientific propositions and ideas" (Obasi, 1999:11-12).

Research design

Research design as a sub-set of research methodology has been defined by various scholars in the field of management and social science based on their area of specializations and research orientations. For instance, Nwana (1981) conceived research design as term used to describe a number of decisions which needs to be taken regarding the collection of data before ever the data are collected. In the same vein, Obasi (1999) corroborated the above opinion by commenting that research design must be determined at the early stage, so as to adequately plan for subsequent decisions such as the type of data to be collected from the research population, how the questionnaire should be structured to generate the required data and how the research hypotheses will be tested.

Anikpo (1986) on his part defined research design as a plan or structure of any aspect of the research procedure. Such a plan according to him will be realized in the selection of the most appropriate concepts, hypotheses, analytical paradigms, specific sampling techniques, instruments and tools of data collection, test for the hypotheses and also the most effective format to present research report (Obasi, 1999). In the opinion of Obasi (1999), under the research design section of a report, a researcher presents the type of design used in terms of whether it is a survey design, archival research or documentary design, experimental design, etc.

Cooper and Schindler (2001) see research design as the blue print for the collection, measurement and analysis of data. They believe that research design aids the scientist in the allocation of his limited resources by posing crucial choices. According to Ujo (2004), a research design is a plan or blue print, which specifies how data relating to a given problem should be collected and analyzed. It provides the procedural outline for the collection of any given investigations. In the words of Tafida (2005), research design means the structuring of

investigation aimed at identifying variables and their relationships to one another. According to him, this is used for the purpose of obtaining data to enable the researcher test hypotheses or answer research questions.

TYOLOGY OF RESEARCH DESIGN

For the purpose of this seminar paper, research design shall be classified into: historical research design, survey research design, case study research design, causal comparative or ex-post facto research design and, experimental research design. The aforementioned typologies of research designs are extensively discussed as follows:

Historical research design

According to Ujo (1999), historical research design is a systematic and objective inquiry into events, development and experiences of the past. Historical research differs from other forms of research in the sense that it is always concerned with the past and calls for a more difficult type of data interpretation. It is however, a very useful and important form of research design. Data for historical research are obtained from primary and secondary sources. Whenever primary sources are available, to use secondary sources would be considered as serious error for the obvious reason that secondary sources are usually very susceptible to distortions and hence may not be authentic as the primary sources. Primary sources include such direct information as accounts of eye-witness and historical objects which can be directly examined or measured. The secondary sources comprise accounts of events by persons who did not directly observe the event. Information from books or newspapers and archival records in form of diaries, tapes, antiques, photographs, drawings and painting are used. In evaluating the data collected, two forms of criticisms; external and internal are employed (Ujo, 2004).

Survey research design

The survey research design is commonly used in management sciences since the researcher has no control over the dependent and independent variables. A survey research refers to a process of eliciting data from a target population through either questionnaire or interview instrument, and subjecting such data to statistical analysis for the purpose of drawing conclusions (Obasi, 1999). Through questionnaires and interviews, survey research:

Makes it possible to measure what a person

knows (knowledge or information), what a person likes and dislikes (values and preferences), and what a person thinks (attitudes and beliefs). Questionnaires and interviews can also be used to discover what experiences have taken place (biography) and what is occurring at the present. This information can be transformed into numbers or quantitative data by using the attitude scaling or by counting the number of respondents who give a particular response thus generating frequency data (Tuckman, 1972:173).

The above point of view suggests that the purpose of research design is to ascertain whether quantitative data will validate or invalidate existing perceptions and belief about a given phenomenon through critical analysis of results obtained from field survey. Moreover, Tafida (2005) observed that "the major characteristic of all survey designs is a lack of control". He went further to say that "the investigator is concerned with observing what is happening to sample subject/variables without any attempt to manipulate or control them".

Experimental research

Experimental research design is a scientific, systematic and rigorous process of data collection, analysis and interpretations. Here, natural phenomena are subjected to laboratory test through the use of apparatus which makes provision for control group. It establishes a systematic and logical association between manipulated factors and observed effects. The researcher defines a problem and proposes tentative answers to hypotheses. He tests the hypotheses and accepts or rejects it in the light of the controlled variable relationship that he has observed.

According to Nnamdi (1991), "there are two categories of experimental designs. These are pure experimental designs with controls and quasi-experimental designs which do not use control groups". He went further to say that "the pure experimental designs always have one form of control group or the other which enables the researcher to isolate or differentiate actual causal relationships and experimentally establish a cause-effect relationship between the dependent and independent variables". The experimental designs are used when the researcher seeks to move beyond description to understanding. It is a research method for specifying causal relationships. In this type of research model, the researcher is more interested in the manipulation of one or more factors and the measurement of the effects of this manipulation on behaviour.

The quasi-experimental design is an alternative research design which the researcher embarks upon when it is difficult to carry out true experiment. The alternative available to such a researcher is to carry out

quasi-experiment. The type of intervention and treatment that are typical of true experiments are involved but there is a lack in the degree of control that is the hallmark of true experiment. In essence, randomization is always lacking in quasi-experiment (Tafida, 2005).

Causal-comparative or ex-post facto design

This type of research design is close to the descriptive and survey methods since researcher under this method has no control over the variables in the sense of being manipulated by them. It is important that researchers using this design do not influence the variable; since doing so introduces bias. The investigator is limited to holding factors constant by judicious selection of subjects according to strict sampling procedures and by statistical manipulation of findings. Ex-post facto design, however, is also known as single case design. This design assumes the form of an experimental design where an existing case is observed for some time in order to study or evaluate it (Tafida, 2005). In ex-post-facto research, the events have already taken place. The researcher's interest is now to investigate the causes, nature and effects of such events. The events is of importance in the decision to embark on the research unlike other types of research where, through such events are of interest, they do not constitute the basic focus or the primary and only reason to embark on the research (Abdul-Maliq, 2006).

Case study research design

This kind of research design lays much emphasis on the extensive and critical study of a given social unit such as individual, groups, society, events and situation/circumstances. The case study is an intensive study geared towards a thorough understanding of a given social unit. The social unit may be individual, a group of individuals, a community or an institution. The number of units studied is limited while the number of variables and situation under which they are studied are diversified. Hence, they usually provide thorough, in-depth, comprehensive and well ordered information concerning the social unit in question. Case study employs a variety of data gathering techniques such as questionnaires, observation, interview, test etc. Case studies are useful in providing relevant background information, which may give rise to more extensive investigations. In-addition, they usually provide specific instances for testing or validating earlier findings or important theories (Ujo, 2004).

CHARACTERISTICS OF A GOOD RESEARCH DESIGN

Certain conditions must be met before a particular research design can be chosen for the conduct of a given

study. For instance, the nature of a given research, identified problem, research questions, field of study and the type of research to be conducted will go a long way in determining the kind of research design to be adopted. Therefore, the following ingredients are considered fundamental for a good research design:

1. A good research design should be able to produce data to answer the research questions and test research hypothesis. Any research design is aimed at solving some fundamental problems before the project can be embarked upon. The investigator for instance needs to find satisfactory answers to questions such as:

(a) Who or what constitutes the population to be studied?
 (b) Will every member of the population be studied or will a sample of the members be studied?
 (c) For studies in which the researcher intends to find the relationship between two variables, will the subjects be studied under experimental condition? (Nwana, 1981)

2. A good research design must be able to control variables by maximizing systematic variables, controlling extraneous systematic variables and minimizing error or random variables. Variable is a measure of variability which is used in statistics to answer research questions and test hypothesis both of which are accomplished usually by comparing variances. The main use of a research design, therefore, is variable control (Tafida, 2005).

3. A good research design must also be able to control independent variables that are extraneous to the study and may influence the dependent variable of the study (Tafida, 2005). For instance, a researcher is expected not to have more than one independent variable in a research question or use an unrelated or unconnected variable.

4. A good research design should maintain both external and internal validity. Internal validity is obtained when the experimental manipulation of the independent variable really generates the types of data the researcher wants in order to answer the research questions and/or test research hypothesis. External validity ensures that the findings of the experimental manipulations are consistent with similar findings for the populations so that they could be generalizable for the entire population (Tafida, 2005).

5. A good research design must be clear and straight to the point.

COMPONENTS OF RESEARCH DESIGN

There is need to follow certain procedure for a research design to provide relevant answers to the research questions. According to Ogunbameru (2000), a research design consists of three components. These are planning, investigation and generalization. The planning stage begins after making a decision to tackle some

obstacles. It is at this stage that the worthiness and validity of the final product of the research process are determined. Before the researcher goes further into the study, a final check should be made about whether the study is worthy of the time needed for close examination. For instance, the first question to ask here is "is this a researchable problem"? To attempt an answer to this question, Ogunbameru (2000) suggest that these four other questions deserve consideration:

- (a) Is the answer to the problem already known?
- (b) Can the solution to the problem be determined from objectively obtained data and/or information?
- (c) Is this a question that can be answered without checking an established policy or using speculation? And
- (d) Are there any ethical aspects, which would preclude carrying out the study?

According to Tafida (2005), the planning stage also involves selecting carefully area of study, defining terms, listing assumptions, developing the methodology and identifying possible limitations of the study.

After all issues relating to the planning stage have been effectively addressed, the next stage is the investigation stage. Basically, the investigation stage implements the procedures designed to answer the problem/question; such as identifying subjects, making observations, gathering appropriate data, obtaining the results and synthesizing the results (Tafida, 2005). The procedures of investigation, according to Ogunbameru (2000), include some of or all the following data treatments:

- (a) Ordering and/or tabulation of the gathered data
- (b) Descriptive analysis
- (c) Correlational analysis
- (d) Inferential analysis
- (e) Summary of results
- (f) Analysis of historical data.

Finally, the third stage is the generalization stage. Here, the investigator begins to evaluate the results of the study by drawing conclusions and relating them to present knowledge, stating implications for administrative and management practices and proposing further research related to the study, Ogunbameru (2000). It is at this stage that the researcher makes statements about the implications of the study, discussing them and relating them to present theories.

EMPIRICAL DEMONSTRATION OF THE APPLICATION OF RESEARCH DESIGNS

All the procedures and processes involved in preferring a particular research design over another have been effectively addressed in the presiding discussions above with a view to guiding and correcting wrong notions about research design. Therefore, this aspect of the study is to

practically demonstrate the wrongful and rightful way of presenting a research design by selecting some completed undergraduate project as specimen for critical examination. Below is a faulty research design, followed by analysis of the faults and a revised research design:

Topic: The relevance of due process in public sector administration: A case study of State House, Aso Villa - Abuja

Research design

The research work is designed to express, explore and carry or show the details for how due process policy work in budget, price monitoring, transparency and accountability in public governance. The research work was carried out in the Federal Ministry budget and economic development and due process office within the federal capital, supervised and monitored by presidency (Aso Rock). Therefore, the primary sources of data collection used are the questionnaires in designing the questionnaire option were provided for the respondents to select.

The analysis

A thorough review of the above study shows that the research topic was appropriate and relevant to the current reforms being carried out in the Nigerian Public service. Also, both the dependent and independent variables are apparent, conspicuous and discernible from the research topic. However, the investigator failed to adopt any research design as an instrument for addressing the research problem, determining the target population, how to structure questionnaires, how to obtain relevant data and test the research hypothesis. One can assume that the researcher may have the intention of using a survey research design since emphases was laid on the use of questionnaire as a means of obtaining primary data. On the whole, the researcher only succeeded in capturing the objective of the study but less emphasis was placed on issues regarding the selection of the most appropriate research design, target population, specific sampling techniques, instruments and tools of data collection, test of hypotheses and also the most effective format to present research report.

The revised form

This study adopted a survey research design due to its applicability in empirical enquiry. It focuses on people and their belief, perception, opinion, attitude and behaviour concerning the relationship existing between two or more variables. Therefore, the study seeks to examine how

due process policy works in budget, price monitoring, transparency and accountability in public service. The research work was carried out in the Federal Ministry budget and economic development and due process office within the Federal Capital, Territory. Hence, the primary sources of data collection used are the structured questionnaires and interview instrument. Since all the staff in State House, ASO Villa-Abuja cannot be studied as a whole, 234 questionnaires were randomly administered to selected respondents in the respective departments while 10 principal officers in the presidency were slated for face-to-face interview.

Other observations from ten (10) selected undergraduate projects are presented below:

1. In most cases, the researcher who supposed to demonstrate the mastery of research design techniques practically end up defining the concept of research design by various scholars in the field of management sciences without adopting a single research design.
2. Most investigators failed to adopt appropriate research designs that are capable of addressing the stated research problem or determine the target population and the nature of data collection/analysis of instruments.
3. Some of the researchers used a sub-set of a research design as the major instrument of data collection, analysis and interpretation.
4. Some failed to state the aspect of research design in the table of content, let alone discussing it in the course of study.
5. Many do not know, when and why a particular research design is suitable or appropriate for a particular study
6. Others cannot even differentiate between the different methods of research designs such as: the historical research, survey, case study, ex-post and, experimental research design.

The implication of the above ugly trends is that, the researchers either use inappropriate research design or failed to adopt any research design at all. In this regard, both the findings and recommendations of such studies may not provide answers to the research questions stated earlier at the beginning of the study. This also means that such researchers have not made contribution to knowledge or are unable to resolve the problems which prompted the study. The major factor responsible for this is the inability of the researchers to critically study and analyze when, why and how a particular research design is suitable for a particular study?

SUMMARY AND CONCLUSION

A research design is a plan or blueprint, which specifies how data relating to a given problem should be collected and analyzed. It provides the procedural outline for the

conduct of any given investigation. There is no single research design that will be suitable for investigating all research problems. In choosing a particular research design, therefore, the researcher must put into consideration, the relevance of proposed designed to the research purpose and its economy in terms of time and material. Time may have some effect on the outcome of the study from inception to the time of the completion. Delay in the completion of research work due to the kind of adopted research design may result into the loss of respondents through death, resignation, nonparticipation, changes in government, weather and events.

The kind of research design adopted in the conduct of given study will go a long way in determining the failure or success of the research work. For instance, the validity and reliability a research work is to a large extent dependent on the appropriateness of the adopted research design. Biased selection of respondents who are overly sensitive to the issue under consideration tends to make them react in a manner that may not reflect their normal reaction and thereby distort the final results. Therefore, the threat to the validity and reliability of research finding can be carefully and tactically avoided through the choice of appropriate research design the execution the research process.

RECOMMENDATIONS

In the light of observations made, issues discussed and findings established, the following recommendations are considered fundamental while making decisions on the choice of a particular research design:

1. Researchers should not only study to acquire knowledge on the meaning, types and procedures for the adoption of a research design but they must make frantic efforts to know why, how and when a particular research design is the most appropriate for a particular study.
2. The choice of research design should be made before deciding the kind of methods and sources of data collection, target population, sampling techniques and tools for testing the research hypothesis.
3. A researcher should meticulously follow the three stages; (planning, investigation and generalization) involved in the research design process before arriving at the logical conclusion. This will go a long way in preventing making avoidable mistakes along the line.
4. The choice of a research design should be tailored towards addressing the stated research problem, pertinent questions, purpose of the study and statement of hypotheses.
5. A pilot survey should be conducted in attempts to determine the internal and external validity of a research design before embarking on a study.
6. Appropriate research design should be adopted with the aim of ensuring proper delineation of the scope and limitations of the research. This will make the outcome of

the study cost and time effective.

7. Potential researchers should make proper consultations with project supervisor, colleagues, lecturers and experts in the field of management sciences with a view to obtaining useful advice on the most appropriate way of presenting a research design before and during the course of the report writing.

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