

Research Designs and Researchers' Quest for Problems Solving Conclusions: Expressing Appropriateness in Designs Identification and Application

Onofere Princewill Okereka¹

Abstract

The social science epistemology has suffered continuing debate between pure and Applied Research even till the contemporary times. The knowledge of research methods and application is a vital pre-requisite for a dynamic social order. The society both advanced and developing got to its present stage of development partly with the help of deep knowledge and appropriate application of research designs. This paper examines the problem of inappropriate application of research designs by many graduate and Post-Graduate students as well as some research practitioners. With the aid of secondary data, combined with the more than a decade of teaching research methods, we combined qualitative analysis with the application of the isomorphic principle to explain the appropriateness of any identified research problem and the design(s) that will yield the expected result or conclusions. Among other things, the paper found that many undergraduate and graduate students as well some research teachers parade themselves with poor knowledge of design identification and appropriate application. Thus they make recommendations, yet the problems persist. This paper recommends among others, that World, Regional or National bodies be established and licensed to register and certify academics through appropriate tests and conditions before their institutions can assign them to teach Research methods courses. This way, the Social Science epistemological argument of it, being Applied or Natural Research can only be defined and understood.

Keywords: Research Designs, Isomorphism, Problem Solving, Appropriateness, Applications, Conclusions.

1. Introduction

Research Methodology as a field of study or body of knowledge performs the function of advancing the frontiers of knowledge in any academic discipline. This is possible through the understanding and applications of all the aspects of methodology as a body of knowledge. These aspects include methods, designs, theoretical and operational concepts, theories and theoretical frameworks, Hypothesis and hypothesis testing among other specifics that constitute the whole gamut of research methodology. Thus, the term research may refer to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in form of solution(s) towards the concerned problem or in certain generalization for some theoretical formulations (Best, 1989:71).

The growth and development of the human society from the primitive age to the modern times, has been attributed to the imports of research. Thus, research efforts have brought about improvements of lives in manufacturing, commerce, technology, and even in our political and administrative lives. It is therefore critical that various aspects of the discipline of research methodology must be mastered and applied appropriately, so as to justify the outcomes of investigation Researchers and teachers of research methodology increase daily, who teach and conduct researches on contemporary societal problems and make recommendations. Yet, problems persist and even more protracted. Then, pertinent questions are raised; are

¹Department of Political Science Faculty of the Social Sciences Delta State University, P.M.B. 1 Abraka, Nigeria

those classically established research methods, designs, ethics and procedures no longer applicable? Or are teachers of research methodology not teaching these relevant and appropriate techniques that are isomorphic to problems identified to be resolved? (Kerlinger, 1973:16).

This paper is an attempt to examine the applicability of the classical ethical prescriptions of research methodology as it pertains to the understanding and appropriate selection and application of research designs. Because experience has shown that designs do not resist the researchers' command, rather, they help him to fail if wrongly selected. This appears to be very correct, such that a researcher may adopt a survey design to investigate a problem which is purely historical. In such case the design will not talk to him but will help him to produce conclusions that will hardly resolve the researchers' problem. In Nigeria today, teachers of research methods in Universities, Polytechnics and Colleges are not in short supply, yet highest percentage of their products, hardly conduct researches and their findings can resolve social problems. Thus, we still experience poor food supply, poor electoral processes, poor electricity supply, perennial collapse, of houses among others. The thrust of this paper is to emphasize the importance of research design in the research process.

Statement of the Problem

The idea of a research process describes the essence of professional series of actions or steps necessary to effectively carry out any research of choice. (Offiong, 1996:21) A researcher must therefore religiously follow this process to arrive at problem solving conclusions.

The advanced countries have made very significant progress in the deployment of research tools and the results is their advancement in technology, Agriculture, Academics, among others. The developing countries are yet to come to terms with the due application of the classical and prescribed research principles. The scientific communities of research methodology is replete with established guidelines and ethics encoded in clear processes that young researchers should follow in conducting research, yet recommendations and conclusions are constantly lured out without necessarily translating into solutions to identified problems of society. Thus, questions are raised whether researchers are at home with selection and application of appropriate designs to conduct such research.

This paper is an effort to account for why most recommendations made by some researchers fail to solve identified problems; arising from inappropriate selection and application of research designs

Objectives of the Paper

The research process is a sacrosanct procedure that a researcher must observe carefully to arrive at problem solving conclusions (Babbie, 1998:32). This paper examines research designs, which is a critical element in the research process.

Specific objectives of this paper include;

- i. To identify and discuss the importance of research designs in the research process.
- ii. To identify and discuss the wrong and inappropriate application of research designs.
- iii. To recommend a template that will help researchers and practitioners apply the knowledge of research designs appropriately.

2. Conceptual Clarification and Application

Isomorphism: The validity of any inference made by a researcher depends upon the methodology used and the internal logic of the theory that guides the research (Emele & Emele) 1996:61). Isomorphism defines similarity and structural agreement of measurement instruments. The concept of isomorphism was used by Nachmias & Nachmias (2009: 156-159) as critical to explaining the role of measurement in research. They aver, that *measurement is the assignment of numerals or numbers to objects, events or variables according*

to rules. For these assignments to produce the expected result, the numerals or numbers must be structurally similar to the events or phenomena govern by rules set by the researcher.

Thus, Isomorphism therefore means “similarity or identity of structure”. In measurement, isomorphism asks the veritable question whether the numeral system applied is similar or agrees with the structure of the concepts of variables being measured.

In line with the above notion, scientists, distinguish among various ways of measuring variables of research. In technical term, refers to as levels or scales of measurement Paul (1985:68). Krippentiff (2004:42), notes that “the mathematics and statistical operation that a researcher can perform on a given set of numbers are dependent on the level of measurement attained.

The above discussion and submissions are indicative that properties of variables or phenomenon to be measured must be Isomorphic. It must conform to the level or scale to be deployed in measuring such variable of study. Researchers have identified four principal levels of measurement which include nominal, ordinal, interval and ratio. These various levels have their unique rules of application. Thus, researchers must be scientific enough to define their variables operationally. This enables him to justify the level of measurement that is applicable. Variables that require classificatory measurement must end with nominal level while, variables that require typical relations of higher than or more desired, should apply ordinal state. This is because, social scientists study many variables that are not only classifiable but also exhibits some form of relations. This property identification and sophistication of study defines the level of measurement that is applicable (Isuekor, 1983:17).

In this paper the philosophy of Isomorphism defines the focus by which we examine the sanctity of operational relevance and application of research designs to studies in an appropriate manner. Consider the example of a builder who sets out to construct a bungalow, he will not just start building, but first consider the strength of materials in relation to the load that the building will carry. Thus, he calibrates his material needs to conform with the expected structures. Social scientists have also established some research designs to be applied in conducting studies across disciplines. The idea of Isomorphism should also be applicable in choosing research design. A builder who intends to build a two-storey house must require higher strength rods than the one who intend to build a bungalow. The same applies to a researcher who intends to conduct a study that requires eliciting primary data as against the other who intends to investigate a phenomenon using secondary data. It is therefore critical that research design must be Isomorphic to the purpose of investigation.

This explanation and application is critical, following the prevalence of examples of research conclusions that fail to resolve societal problems. Subsequent, sections discusses research designs and some common specimens of research designs.

3. Research Design Conceptualized

A researcher who strives to solve societal problems must first determine objectives. Once this is done, he is confronted with the problem of constructing or choosing a design that will help him test his hypotheses and answers research questions as the case may be. Research design is the established framework that guides the researcher in the collection, analysis and interpretation of results. It also defines the generalizability of research conclusion (Nwogu, 2006, Ogunbiyi, 1984).

A 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 economy in procedure (Kothori & Gauray, 2014:29). It is therefore a conceptual structure within which research is conducted; which constitutes the Blue print for the collection, measurement, analysis and interpretation of data.

In view of Nachmias, & Nachmias (2009:99) “Any researcher who is about to test any hypothesis faces some fundamental problems that must be solved before the project can be started; - whom shall we study? What shall we observe? When will observation be made? How will the data be collected?” They write that,

research design is the “blueprint that enables the investigator to come up with solutions to these problems and guides him or her in these various stages of the research.

Kothari & Gauray; (2014:29-31) explicitly argues that a researcher must begin by posing and answering certain questions and correctly too before he can settle for a particular design. Such questions as,

- i. What is the study about?
- ii. What type of data is required?
- iii. Where can the required data be found?
- iv. What will be the sample design?
- v. What technique of data gathering will be used?
- vi. How will the data collected be analyzed? The clear answers to these puzzles, defines the idea of “design decisions”. These design decisions, must be followed in the conduct of the research. Thus, it is a sacrosanct exercise to be followed. The design decisions help the researcher to identify, the appropriate research design that will help him achieve the objective of the research. The specific analysis of this impact will be discussed in the next section of the paper, where some commonly used research designs are identified and discussed. Summarily, a research design include a clear statement of the research problem, procedures and techniques to be used for gathering data relevant to a study, the population to be studied and instruments to be used in processing and analyzing data so elicited (Onifade 2004:76).

4. Discussion of Some Commonly used Research Designs

Historical Design

This design is sometimes referred to as qualitative design. In historical design the researcher is essentially, concerned with showing, describing and interpreting what was or is (Macau, 1986:12). Thus, there is no attempt at discovering new phenomena. At best, the historical design aims to expose conditions or relationships that exist, practices that prevail, the processes that persist, beliefs, points of view or attitude that are held by a people. It also captures the trends that are developing in a group or institution.

Consider the specimen examples of the following research topic:

Oil Exploration and the buildup of Youth Agitation and Militancy in the Niger Delta Region.

In this hypothetical research topic, the interest of the researcher is in the investigation of the – Buildup of Youths agitation and militancy – which started as a result of oil exploration and exploitation. Thus, the appropriate design should be Historical. The Historical design will help the researcher to trace the history of oil exploitation and all attendant operations that led to youth militancy.

Political Alliances and Winning of Presidential Elections in Nigeria.

In this kind of research, the researcher is concerned with tracing the history of political alliances among major ethnic groups in Nigeria and how these alliances have worked or failed in moulding the success or failure of presidential candidates. The most appropriate design in this regard becomes the historical design; which will help him to logically trace the variables that encouraged alliances and electoral successes. Therefore, researchers are admonished to ensure that they master their statement of problem so much that they are able to identify the appropriate design that can help there to logically prosecute their investigation to a logical conclusion.

Survey Design

This design is sometimes called statistical or quantitative design. It is a plan in which the researcher aims at finding out the distribution or characterization of any type of phenomena among individuals in a large populations or universe (Sanubi, 2011:48),

The population could be people, trees and other items of study. The structures of survey design include;

- i. Population of study
- ii. Accurate representative sampling using probabilities or non-probabilistic techniques.
- iii. Questionnaire or interviews
- iv. Methods of Data Analysis
- v. Interpretations and Generalization.

Survey Studies are not constrained by the large size of the study population because it makes use of scientific techniques to guide the study of such large population. This method is justified by the assumption that there are very similar elements in any population. Therefore, one does not have to study all elements of the same kind since what you find out for one element could stand for the rest of the elements which are similar to it (Ezeji, 2004, Kaplan, 1973).

Consider the following research topics

Poverty and Prostitution among Female Students in Nigerian Universities

The interest of the researcher in this topic is to establish whether poverty has a positive relationship with high rate of female prostitution in Nigerian Universities. First he must establish his study population and determine his sample. This is because, he cannot study all females in Nigerian Universities. The researcher must first choose some Universities and number of females using appropriate techniques of survey design.

Experience has shown how students and even research teachers adopt historical design to study topics of this nature. The outcome is always conclusions that cannot solve problems.

Focus Group Discussions (F.G.Ds)

This is a more contemporary design or method of gathering more accurate primary data or information in some unique research endeavours. According to Sanubi, (2011:28-30), Focus Group Discussion (FGDs) involves the researcher identifying critical stakeholders that are incidental to the phenomena of study and applying schedule system to pose questions to elicit answers that are primary to the event of study. The schedule questions may be closed or open, depending on the resources available to the researcher. It is relatively expensive.

Consider the hypothetical research topic below;

Causal Elements and Increased Prostitution Among Young Nigerian Sex Workers

In this kind of topic, the researcher is expected to adopt a design that will bring him or her to the element of study (the prostitutes) in such a manner that they will be free and confident to give information about themselves without being violent or withdraw. Thus, FGDs, design becomes, handy and appropriate to be adopted. According to Unanka (2002:208), Focus Group Discussions yield the best results when appropriate structure is followed by the researcher.

The Structure of FGDs

The structure of FGDs is determined by the researcher but usually takes the following pattern;

- i. The research identifies and determines the critical elements (individuals) that constitute the members of the group.
- ii. He designs the schedule, the shape of the questions and envisages the line of responses from the members. (This usually takes the form of open discussions and responses. The members are made to see themselves as stakeholders in the study who stand to benefit from the outcomes.
- iii. The researcher identifies a suitable venue for the discussion. This venue must provide the members the free will to contribute meaningfully to the discussion without molestation or being harm.

- iv. The researcher must uphold the ethical standard of ensuring the safety of participants. This may include adequate allowance application.
- v. The researcher must show expertise in his moderation of the discussion to control for extreme variables that may exacerbate or trigger anger.
- vi. He must possess a good knowledge of measurement and analysis of data. Outcomes of the discussions. This may be quantitative or qualitative.

Content Analysis

Content analysis has assumed quantitative dimension following the scientific pursuit of the social sciences. However, it has a close applicability to qualitative methods. It enables the researcher to include large amounts of textual information and systematically identify its properties; the frequencies of most used keywords (KWIC) – key words in context” by detecting the more important structures of its communication content. Kimberly (2002:64) sees content Analysis as a systematic, objective and or quantitative analysis of message characteristics; it includes the careful examination of human interactions, the analysis of character, portrayals in television commercials investigation of word usage in new releases and political speeches.

Content analysis is applicable to many areas of inquiry with examples ranging from naturally occurring language, to study of newspaper coverage of specific sector of the economy (Editorial Columns).

The major concern of the content analysis is the careful identification of the more frequent words, or intent of the literature or communication (Kimberly, 2002, Goel, 1988, Turabian, 2007).

According to Sanubi (2011:28), content analysis must address such questions as

- i. Which data are to be analyzed?
- ii. How are the data defined?
- iii. What is the population of study?
- iv. What is the context relative to the data to be analyzed?
- v. What constitutes the boundaries of the analysis?
- vi. What is the target of the inferences?

The assumption of content analysis is the words and phrases as well as the patterns of their applications in the communication. Thus, it deals with “*manifest contents*” of the communication. Content Analysis can be qualitative and quantitative depending on the data, analysis procedure or technique the researcher chooses to adopt.

Experimental and Quasi Experimental Design:

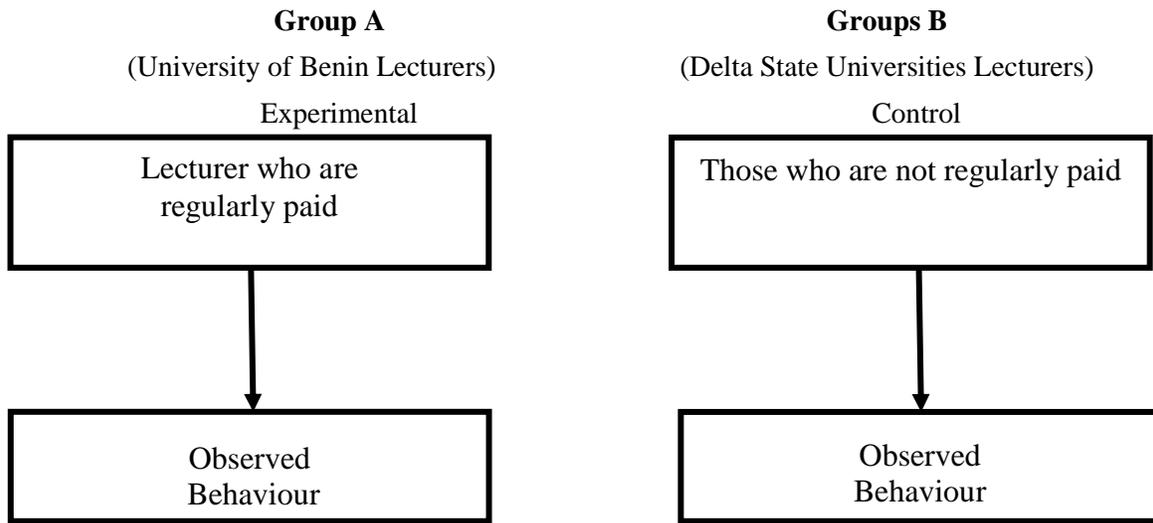
The goal of experimental design is to establish casual effects; it is the most appropriate for establishing causality. It strives more, to meet the three basic criteria for causality of association, time order and non-spuriousness. The experimental research could take any two forms, the field experiment (Natural Setting) or Laboratory experiment with relatively high degree of control on extraneous variables Ogbeide (1999:16-21). Importantly, it has to be stressed that experimental design is majorly a design for the natural or physical sciences.

The quasi-experimental design is similar to the experimental design in the pure sciences, “the experimental and” the control groups.

In some studies in the social sciences, scientists try to adopt this quasi-experimental groups to all scientific stimuli to enable it respond to an expected behaviour, the control group is denied some, or all of these stimuli to enable it exhibit a behaviour that will show marked difference from the experimental groups. Consider the example of a researcher who intends to know the degree of performance of lecturers who

participate in the teaching of students in the weekend degree programmes during periods of non payments of teaching honorarium.

Fig. 1



In the diagram above, the researcher would ordinarily observe that the commitments of the lecturers in the experimental groups whose honorarium are regularly paid will be increased and vice versa. The major difference between experimental and quasi-experimental is that of natural and behavioral influence of variables. Thus, while experimental design is for the natural sciences, quasi-experimental can be adopted to study phenomena in the social sciences.

5. Conclusion and Recommendations

The growing discussion on whether researchers in the social sciences can be fundamental or remain applied has attracted various academic reactions. This paper is one of such reactions. It attempted to draw attention to the fact that teaching and learning of research methodology is dwindling. This appears so, because the teaching of the philosophy of research methodology has appeared diluted by instructors who have little knowledge of research methodology.

Whether research endeavour is fundamental or applied, is a function of design identification and adoption. The failure of a crop of instructors to chose and adopt appropriate designs have culminated in wrong findings and conclusions. These have not helped in resolving identified social problems.

In attempt to resolve the problem of inappropriate application of research designs, this paper has tried to examine the concept of Isomorphism and used it to explain how designs must agree with research topics in principles and internal structures. It also carefully explained the philosophy of research designs and their features and structures. Importantly, the paper identified and explained with specimen examples of some most frequently used research designs in the developing countries, as it pertains to the social sciences.

This paper is an attempt to implore research teachers and practitioners to pay more attention to the classical idea of the appropriate use of research design, as it is a precursor to a successful investigation of social problems.

6. Recommendations

This paper is a theoretical one that examined existing ethics and principles of research; and found that the highly revered discipline is being watered down by mediocre and unskilled handlers. Thus, the paper

among others things recommends the following template to improve on the teaching and learning of research methodology.

➤ It has been discovered that some teachers of research methods are ill experienced and equipped to teach research methodology. Thus, it is recommended that a professionally registered body be established by the researchers scientific community which must register and license professional members to teach research methodology in their various institutions.

➤ The book market is inundated with books that are of very low quality. Some of these book and materials are prepared by those with questionable knowledge of research methodology. Defective knowledge, are put forward in these materials which students buy and internalize, leading to poor understanding of the discipline. It is therefore recommended that established bodies in research methods must first vet and approve any new material to be used to teach research methodology; and its producer endorsed.

➤ It is recommended that in all Universities and colleges, a minimum content and standards must be uniformly set to teach research methodology. This will ensure a uniform knowledge to be taught to students of research methods.

➤ Experience has shown that students both at graduate and Post-Graduate levels see research methodology like mathematics. Thus, instructors must develop new and simpler approaches to teach research methodology. It must be demystified, and present it to our students as a simple subject which requires no unique intellectual prowess to do well and master it.

➤ It is recommended that teachers of the subject must do more of practical exercises than of classroom work. Thus, student must often carry out researches and put to play all the principles and procedures that are sacrosanct to effective research practice.

➤ Knowledge of research Methodology must be introduced to student right from the year of entry into higher institutions. This will ensure early introduction to the knowledge of research, its utility, practices, principles and procedures.

By this early introduction, they will be used to its cannons and have more time to study research methodology adequately. This is in contrast to what obtains in most Universities and Colleges; where students are introduced to research knowledge at their year three.

It is the hope of this paper, that the application of some of these recommendations will promote, professionalize, and ensure the appropriate identification and application of research principles, methods and procedures. It is in this way that design application can yield conclusions that will solve societal problems.

References

- Babbie, E. (1998), *The practice of social research*. 10th ed. Wadsworth: Thomson Learning Inc.
- Best, J.W. & Kahan, J.A. (1989), *Research in education*, 6th edition, New Jersey U.S.A. Prenlicehall Inc.
- Emele, O.U. & Emele, C. J. (1996), *Fundamentals of research methodology and statistics in education and behavioural sciences*. Aba: Model Academic Publications Limited.
- Ezeji, S.C. & Ezeji O. A. (2004), *Basic Principles of Research in education*. Enugu Nigeria Cheston Agency.
- Goel, M.I. (1988), *Political Science research*, U.S.A. Iowa State University Press.
- Itsuokor. D.E. (1983), *Essentials for test and measurements*. Abraka: College of Education Press.
- Kaplan. A. (1973), *The conduct of inquiry: Methodology for behavioural science*. Aylesbury Bucks: International Textbooks Company Ltd.
- Kerlinger, F.N. (1973), *Foundations of behavioural research*, 2nd edition. New York; Holt Rinehart Winston Inc.

- Kimberly A.N. (2002), *Content Analysis. A Guidebook*, London, Sage Publication.
- Kothari, C.R & Grauray, G (2014), *Research Methodology; Methods and Techniques*, NewDelhi, New Age International Publishers.
- Macau, R.B. (1986), *Fundamental Statistics for behavioural sciences*. 4th ed. New York: Harcourt Brace Jovannovick Publishers.
- Nachmias, C. F. & Nachmias, D (1996) *Research Methods in the social sciences*, 5th edition, New York: St Martin's Press.
- Nworgu, B. G. (2006) *Educational research: Basic issues and methodology*. Nsukka, Nigeria: University Trust Publishers.
- Offiong O.J. (1996), *Formulation of research hypotheses*, in Osa Osamwota et al (Eds), *Research and statistical methods in social sciences humanities and education*, Lagos: Amfitop Books Company.
- Ogbeide, U. (1979), *Statistical techniques for social and management sciences*, Lagos; Amfitop Book Company.
- Ogunbiyi, M. R. (1984), *Education Measurement and evaluation*. London: Longman.
- Onifade, A. (2004), *Handbook in research and Statistical Analysis*. Abeokuta: Kappo, Nig. Ltd.
- Paul, D.L. (1985), *Practical research planning and design*. New York: Macmillan Publishing Company.
- Sanubi, F.A. (2011), *The science of Politics: An Introductory Methodological and Statistical Approach*, Ibadan, Nigeria: Ibadan University Press.
- Turabian, K. L. (2007), *A manual for writers of Research Papers, Theses and Dissertations* 7th edition, London; The University of Chicago.
- Unanka, G.O. (2002), *Methodology of Social Science Research; Investigation in Social Relations, Politics and Administration* 2nd Editions, Owerri- Nigeria, All-Ages Publishers.