

THE IMPERATIVE OF POPULATION SAMPLING IN SOCIAL SCIENCE RESEARCH

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ABSTRACT: *The quality of any research and its findings is connected and /or shaped by the process diligently followed. This suggests an unending link between the methodology (process) and the quality / outcome of a research. This paper explains the imperative of population and sampling and the value it adds to the quality of research and its findings. The paper is an explanatory one that analyses documented views of experts in the field of research and correlate same with the experience of the researcher. Observations and assessment of researches conducted by students of undergraduate studies and most times the graduate students' revealed research procedural lapses. These lapses are mostly methodological that affect considerably the quality/outcome of their researches. The emphasis hinges on the need to pay required attention to the population and sampling procedure to ensure accurate research findings not speculative outcome.*

KEYWORDS: *population, sampling, quality, findings*

INTRODUCTION

The place of research in the task of knowledge acquisition and development cannot be overemphasized. Scientific inquiries, management and administrative theories and techniques developed and sustained through constructive research processes. It is on this basis that scholars and practitioners in all fields of knowledge development agreed to place considerable importance and priority to research process. This is so in order to measure the substance and weight of research findings for its subsequent adoption to advance the cause of human development. What therefore constitute knowledge within and outside the academic realm is no more than a certified "idea" properly screened and certify to have gone through the conventional and meticulous research processes which also satisfies the basic requirements of time

Research in social and management sciences naturally begins with observable phenomenon then a topic that captures the spirit and intent of the researcher. This topic is, in most cases, largely influenced and/ or affected by the nature and complexity of the research problems which again to a larger extent determine the frame of the topic. A topic of research and statement of problem are apparently inseparable, as one is the corollary of the other. They both therefore provide a clue

and direction for the research journey. Suffice it to say therefore that, this part of research process constitute the question upon which the research journey is embarked upon, the findings may be accepted for knowledge development having met the requisite academic conditions. The intellectual concern may not necessarily begin with the adoption of topic and research question but WHERE and HOW to provide a suitable and acceptable response to the issues raised. The weighing and measurement of findings and/or theories traditionally focus on the methodology with the key questions of HOW and WHERE. Available instances are bound to attest to this especially if the conventional regular research defense exercise is considered. This research therefore is an explanatory one that seeks to provide content analysis of relevant literature to the topic under consideration. The research explains and remains critical on population of study, sampling and related issues stressing on their imperativeness and impact on the research outcome.

This paper examines the importance of population and sampling in research process. The objective is to appreciate the imperative of this aspect of research process in the determination of the quality/substance of findings. It is also to determine the influence of population sampling in the realization of stated objective, as it's only through properly sampling that the required data can be obtained for knowledge building and development.

Conceptual Explanation of Population and Sampling

The significance of population and sampling will be better appreciated in a survey type of research. A survey research refers to a process of eliciting data from a target population through questionnaire or interview instrument and subjecting such data to statistical analysis for the purpose of drawing conclusions (Obasi, 2000: 132). Accepting this will mean that the information required can only be gathered from a target or specified population relevant to the purpose and problems raised for the study.

Population

A population is a theoretically specified aggregation of survey elements. A survey population is aggregation of elements from which survey sample is actually selected (NGU, 2005: 166). Asika, (1991: 39) sees a population been made up of all conceivable elements, subjects or observations relating to a particular phenomenon of interest to the researcher. Elements and subjects refer to those individual items or variables that make up the population. They may be observed and physically counted.

A population may be finite, that is, the size is conceivable and measurable. For instance, women population in the University of Abuja can be counted so as the male population. A population could also be infinite if the elements or subjects cannot be counted. If for instance one is to know the exact number of leaves, trees, grain of sand in the world. This is simply impossible even when the elements are visibly conceivable. However, a population can be finite yet not conceivable.

Population Sampling

Social science research by its nature relies on a dynamic population and some time complex. The dynamism and complexity therefore necessitated the use of sampling to ease the process to a

logical finding. Nnamdi (1991) observed that whether a population is finite or infinite, the process of drawing a sample from that population can be arduous, expensive and time consuming. Consequently, sampling is made for the following reasons:

(1) Among the elements that make up the population of study, there are similarities and therefore a study of a few of these elements will give the researcher sufficient knowledge of what obtains in the entire population of study.

(2) Sometimes it is practically impossible to take a complete and comprehensive study of the population because of the nature and pattern of distribution or dispersion of the elements of the population.

Consequently, sampling becomes imperative because it is the only way to estimate the population characteristic in such circumstance.

(3) It is obviously cheaper to study a sample than the entire population.

(4) Sampling enables researchers to be more thorough and affords him/her better supervision than with a complete coverage of the entire population.

(5) Sampling enables us obtain quicker results than does a complete coverage of the population.

Sampling is no doubt a veritable instrument or strategy to unravel a research problem. It is on the importance of this that Nnamdi (1999) again provided a series of questions to guide a meaningful design of a sample. These questions are fundamental to guarantee a well structured and purposeful sampling. They include;

a. What is the definition of the population of a study? For instance, population as male students, Nigerian students, market women, civil servants, pensioners, politicians, professionals, general public etc. The argument here is that the population should be properly identified and defined to include its size, characteristics and categories to avoid inclusion of non relevant elements.

b. The second question is; what is the sampling frame? By this it means that the researcher should identify his working universe from which the sample is drawn. For instance, it is important to know if the universe is theoretical or conceivable not reachable or a reachable working universe.

c. The third question is what type of sample should be drawn from the population? It is important to know the appropriate sampling method for the nature of population, whether probability or non probability sampling.

d. The last question is what are the parameters of interest? What does the researcher actually wants to get / obtain from the population. These interests should be identified clearly (Interest as generated/drawn from the research problem, question and hypotheses).

Nnamdi (1991) however noticed that, authors have given variance of two types of sampling, i.e probability and non probability. Some of the terms as used by authors in place of probability and non probability sample are Random and non Random sample, probability and purposive samples, strategic and non strategic sample, they essentially mean the same thing. But Babbie (2007) presented the following arguments, that;

I. Findings based on a sample can be taken as representing only the aggregation of elements that compose the sampling frame.

- ii. Often, sampling frames do not truly include all the elements their names might imply. Omissions are almost inevitable. Thus, the first concern of the researcher must be to access the extent of omission and to correct them if possible. The researcher may feel that he or she can safely ignore a small number of omissions that cannot easily be corrected.
- iii. To be generalized even to the population composing the sampling frame, all elements must have equal representation in the frame. Typically, each element should appear only once. Elements that appear more than once will have a greater probability of selection, and the sample will, overall, over represent those elements (Earl Babbie 2007:201).

On the manner of sampling, Eboh reported in (Obasi 1999) observed that, the size of a sample is determined by a combination of technical issues as well as human and financial considerations. First, on the technical factors, the size of population, the level of precision (accuracy) desired, the level of variability of the factors (variables) to be estimated, the homogeneity of the population, extent of prior knowledge about the characteristics of the population, among others, are critical determinants. Secondly, the human and financial determinants include cost of research and level of funds available to a research, time consideration and issue of logistics.

Nwana also reported in(Obasi 1999), holds that, if the population is a few hundreds, a 40% or more sample will do; if many hundreds a 20% sample will do; if a few thousand a 10% sample will do; and if several thousands A 5% or fewer samples will do. This means that, the lower the population, the greater the percentage of sample, and when the population is much the percentage of sample becomes lower. A good sample should and must be free from error of Representativeness. It should be accurate and precise, Should also be exonerated from sample bias.

Methods of Sampling

There are basically two methods of sampling from a population. They are probability selection method and non – probability selection method. The probability sampling is the sampling method in which the sample items or subjects are chosen randomly, where every item in the population is given equal and independent chance of being included in the sample. The methods of selection here include;

- a. Random sampling
- b. Systematic sampling
- c. Stratified sampling
- d. Area / cluster sampling

Random sampling

This technique avails every member variable of the population equal opportunity and an independent chance of being selected. This privilege and opportunity is the most distinguishing feature of this technique. An independent chance of being included means that the selection of one person or element does not affect the chance of another person being included (Obasi, 1999). The incentive accruable from this technique is its wider applicability, non assumption of prior knowledge of the population and its freedom from classification error in addition to the simplicity of understanding. It is also observed however that, despite these advantages, the

random technique is likely to eliminate certain characteristics of the population in sampling. This include among others; male, old, young white .etc.

Secondly, there is the existence of large sampling error for the same size than in stratified sampling (Obasi, 1999).

Systematic Sampling

Simple Random sampling, as observed by Bobbie (2007: 202), is seldom used in practice. It is not usually the most efficient method and can be laborious if done manually.

The systematic technique with a random start therefore is more rewarding. In this system, two terms are frequently used in connection with it. The sampling interval is the standard distance between elements selected in the sample. The ratio is the proportion of elements in the population that are selected.

Stratified Sampling Technique

The stratified technique is most convenient for a heterogeneous population. This technique divides the population into subgroups on the basis of variables significantly correlated with the dependent variables (Ngu, 2005: 177). The adoption of this technique further suggest that, some conditions have to be observed, these include; the awareness of different characteristics of a target population, the conviction that such characteristics may not be adequately represented without classification. The last condition is therefore the need to include the different strata before a reliable generalization can be made. This argument was aptly captured by Obasi (1999) as he maintains that a stratified sampling technique is one that recognizes different groups (or the composite characteristics) of a target population and takes appropriate measure to include them in the sample.

There are two types of stratified sampling, namely: proportional and disproportion stratified sampling. In the former, the representation of each group of the population into the sample is based on their numerical strength in relation to the population, while in the latter; the numerical strength is not strongly taken into consideration. Some strata may be more represented in the sample than other.

Obasi (2000) concludes that, this technique is more rewarding when compared to the simple Random technique, as the stratified provides high degree of representativeness of the composite population characteristics. With this therefore, the chance of sampling error is considerably minimal. The combination of Random sampling and the stratified type make up a multi stage approach.

The multi stage approach

The multi stage approach is a concurrent use of the two techniques. This means that the population is first of all classified into different groups, within each stratum; a simple random sampling technique is applied.

Area / cluster sampling

The cluster or area sampling technique is used when it is either impossible or impracticable to compile an exhaustive list of all the elements comprising the population study or target population (Ngu, 2005: 180).

Nnamdi (1991:44) observed that, like the stratified sampling, cluster / area sampling makes use of random sampling to select the sample subjects from each cluster / area, thus it is as effective as a stratified sampling method. He further observed the following as the steps in cluster sample.

1. Identify the population to be sampled, e.g all household Units.
2. Identify the salient characteristics that you think would enhance representativeness, ethnic groups within the population.
3. Locate the areas where Units or subjects with the characteristics cluster and know their respective size (population sub set).
4. Use Random selection procedure to select your sample Units or subjects from each cluster and make sure that the number of units selected is proportional to the cluster's share of the total population.

Non probability sample method

The most distinguishing element between the probability and the non probability methods of sampling is the absence of the privilege of having equal chance of being selected in the latter method. Non probability sampling does not use random sampling yet it is often necessary and Unavoidable.

Their weaknesses could to some extent be mitigated by using knowledge, expertise and studies with different samples. Also, the use of powerful statistics could to a large extent mitigate sample error (sample variability) caused by the use of those subjective techniques (Fagbohunge, 2009:99).

But Nnamdi (1991:45) maintains that Randomness may however occur by chance but it does not really matter whether randomness exists or not in the non probability sampling process because the population elements are not deliberately given equal chance of being selected. The non probability is somehow purposive by its nature. In the words of Obasi (2000:45) there are research situation which make the use of non probability sampling necessary. Selltitz, etal (1974) maintains that if the goal of a survey is to obtain ideas, good insights and experienced critical appraisals, a purposive type of non – probability sampling is suitable. That if the goal is not to estimate population characteristics, and then a non probability sample is suitable. This is because it has major advantages of convenience and economy. If again, a researcher is interested in particular issue which very few people have knowledge about, a purposive decision has to be taken to include only such knowledgeable people. There are three main types of non – probability samples. They are the accidental or convenient samples, quota samples, and judgment samples.

Accidental or Convenient Sample

The convenient is to whose advantage, if asked, to the researcher of course. This is because the use of the probability sampling techniques is not readily practicable in industrial settings. It may not be easy for a researcher to gather all male Muslim students in public Admin department or

their names from which he randomly or systematically select his sample. Therefore to overcome this difficulty he has to resort to accidental or convenient sampling technique.

Snow ball sampling

The Snow ball sampling starts with identifying a person who meets the researcher interest upon who the researcher relies to introduce him to other performances with similar characteristics. (Fagbohunge, 2009:99). This is particularly useful where people are not likely to volunteer to strangers, e.g the Alqaeda network, BOKO HARAM group, Smugglers, Drug Cartels among others, or seeking confidential information that are not available for consumption.

Quota sampling

Here the knowledge of strata of the population (sex, education, religion, age) is used to select member that are representative i.e quota or proportions is assigned to people. The researcher decides ahead of time what aspect of sampling is alright in exploratory study, particularly where the budget and time is limited. The choices of respondents who represent the diversity in population in the same population are the diversity itself. The quota system in the Nigerian administrative system suffices in this explanation.

Purposive sampling

Sometimes researchers do find it difficult to elicit responses from respondent, may be out of fear or suspicion of the motive for the research, therefore, to elicit the cooperation of the respondents when suspicions circumstances prevail, a researcher can use the purpose of the research to convince respondent. It also includes a situation whereby an investigator deliberately chooses only those who have relevant view on the issue at hand.

Captive Sampling.

This is a kind of forced participation. The Government of a nation uses such approach during census and election; by simply imposing non - movement order on the citizenry, they will be turned to captive participants. The process is captive sampling since participation in the trial census or election did not involve every citizen. In a trial census, about three different sampling techniques are involved, that is multi stage technique.

GENERAL DISCUSSION

It's obvious that research occupies centre stage in human civilization and development, more significantly is the process that drives the efforts to a desirable ends. Research process, if durably followed leads to accurate results that promote intellectual confidence and valid knowledge acquisition. In any research effort, the population is usually determined by the target and objective outlined to be achieved. Population sampling is followed through systematic means for efficient management of the elements making the population of study. The emphasis here is that population of study is not just any conceivable or inconceivable elements but those elements that have the capacity and readily disposed to address the impending research questions to meet expectations. Experience has over the times shown that students and researchers often confused population of study with population census, whereby the consideration and emphasis are on the quantities of particular elements even when those elements may not altogether be

relevant to the subject of discussion or are indisposed to provide data. For instance, a study designed to be conducted to determine the effectiveness of poverty alleviation program from the public. In this case, the population cannot be the general public as not all individuals are poor or concerned with the activities of the agency. Again, amongst the public there are infants and under-age that cannot be disposed to answer questions but are counted amongst the elements or population of study. There are also psychiatric patients, lunatics and aged who are part of the general public and captured in the size of population but are obviously indisposed and therefore irrelevant. In this case also, there are unlettered/ illiterates groups that have no intellectual capacity to understand the workings and expectations of the anti poverty agency in order to determine its effectiveness. The understanding of this research process therefore ensures the elimination of these irrelevant segments of population to avoid sampling errors. Accurate sampling prevents speculative research outcome. It is only when this technique and research fundamentals are procedurally maintained and followed that valid knowledge can be obtained for true development.

CONCLUSION

Research process and its importance have taken a centre stage in the field of knowledge development. This paper submits to the argument that holds on to the instrumentality of population sampling as a veritable factor to a refined and productive knowledge acquisition. Adopting a sampling technique for a research without appreciating the nitty gritty and following the Underlined process to the latter will no doubt jeopardize the quality and reliability of research findings.

It is a common phenomenon, in contemporary research world that, students only identify the methods of sampling and ignore the techniques. In some cases, the methods and techniques are mistaken for one another. It has therefore become necessary, as a matter of urgency, to lay additional emphasis and make it a basic requirement, from the Undergraduate level to understand the major techniques and sampling methods available in the research process. This is to forestall the integrity of research and education. The growing neglect of this aspect of research process will, as it has been, further reduce the quality of research and by extension quality of knowledge. This problem is greatly challenging because it will allow for unfiltered and unproductive knowledge to permeate the human environment.

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