17

Research Methodology

Jagjeevan Ram Bairwa*

Introduction

Research has different meanings to different people. According to (Wiersma William and Jurs, Stephen G.). Kerlinger (1986) defines scientific research as "Systematic, controlled, empirical, and critical investigation of natural phenomena guided by theory and hypotheses about the presumed relations among such phenomena" (Du Plooy G. M.). Any research work is a theory confused with speculation and it remains speculation until it is proved and becomes fact - definite, certain, without question and their meaning to be self-evident. Research has become an indispensable component of eligibility practically in all educational programs in the world of academia. Thinking, constant assessment, reassessment and making decisions about the best possible means of obtaining information that is trustworthy are common procedures of any research. Conducting research requires mastering knowledge of Research Methods and Skills Module or basics of research. It is not only a necessity, but also very essential and useful for academics.

Research is a process of collecting, analyzing and interpreting information to answer questions. But to qualify as research, the process must have certain characteristics: it must, as far as possible, be controlled, rigorous, systematic, valid and verifiable, empirical and critical. A researcher must become acquainted with the large range of different research designs in order to produce different types of products: observation, classification, measurement, control, prediction. The research process is broken down into two phases: formulating the question, and seeking the answer. In formulating the question the researcher decides how to identify a research problem, narrow the topic to focus on the relevant issues, review previous research literature, formulate an answerable question, and state hypotheses of expected outcome. In seeking the answer, he decides how to collect data, analyze findings, interpret evidence, summarize and draw significant conclusions.

* Assistant Professor, Department of English, Government College, Dausa, Rajasthan, India.

A researcher also needs to gain an appreciation of the variety of different motivations for research - to characterize phenomena, gain new insight, solve problems, verify applications or test models, etc. A proper Research method equips a researcher with an understanding of a multiplicity of methods, i.e., the process and the product of research. In the process of research one may define a problem, state an objective, formulate a hypothesis or test a prediction. The product of research may result in a description, analysis, evaluation or explanation. Methodology (the science of method, or orderly arrangement) is the science dealing with principles of procedure in research and study. It is the pathway or an approach to get the needed information by locating the data from different sources which are primary & secondary. A systematic, diligent, scientific, evidenced based method to pursue a research in any discipline is the best method.

Methodology is the study or description of methods. It is a documented process for management of projects that contains procedures, definitions and explanations of techniques used to collect, store, analyze and present information as part of a research process in a given discipline. Methodology is part of the thesis writing process includes a description of the sampling method to be used in the work as well as justification for it.

It describes the materials that will be used in the data collection process: questionnaires, tests, special equipment, etc., and at the same time, addresses both validity and reliability of the instruments and describe how they will be used in data collection. Sampling method is a part of the thesis writing process. Following a competently written methodology, a knowledgeable researcher must be able to reproduce the results in exactly the same way, as it has been done in his thesis. A research is conducted on the basis of guided enquiry to test the authenticity of definite propositions. It states what the researcher looks for. When facts are assembled, ordered and seen in a relationship they constitute a theory.

Hypothesis

A hypothesis looks forward. It is a proposition which can be put to a test to determine its validity. A good hypothesis should be scientific, simple and presented in a testable form. When propositional knowledge that holds true for the whole class of phenomena, it postulates the existence of a determinate relationship between a set of variables (variable is an aspect of reality that can assume different values) in terms of which empirically ascertainable regularities can be explained.

Components of Research

A research work is a scientific activity. And so, whenever a research is performed, it passes through certain processes. A well-designed research consists of the following components:

- **Perspective:** Any systematized enquiry of mutually consistent assumptions which underlie one's approach to things the researcher want to explore is known as perspective.
- **Research Design:** Research design is the conceptual structure within which research would be conducted. The function of research design is to provide for the collection of relevant information with minimal expenditure of effort, time and money.
- **Research Design Objectives:** Research designs are closely linked to an investigator's objectives and accordingly they specify that research designs are exploratory, descriptive, and/or experimental in nature. Consistent with these types of research design, they delineated four major purposes of research (1) to gain familiarity with a phenomenon or to gain insights, (2) to describe things, (3) to determine associations between variables, and/or (4) to test hypothesis.
- **Subjects:** The researcher, in order to come to his judgment, selects the easiest population members each of several categories for accurate information with good prospects.
- **Problems of Objectivity:** Objectivity is a goal of scientific investigation. Objectivity continues to be an elusive goal at the practical level. However, no technique of data collection is perfect. Each technique may lead to subjectivity in one way or the other.

The preparation of research design, appropriate for a particular research problem, involves the consideration of the Objectives of the research study, Method of data collection to be adopted, Source of information, Tool for Data collection, Data Analysis (qualitative and quantitative), etc. are some of the important aspects that determine the findings and conclusions of a research.

In the process of formulating the research design, the investigator must determine whether or not to use some kind of sampling plan. It is up to the researcher if he plans to study people selecting a particular population or only a portion of element taken from the larger population or universe. In making this decision he usually considers at least three important factors- the size of the population, the cost of obtaining the elements, and the convenience and accessibility of the elements.

Instrumentation

Questionnaire and observation schedules were the main instruments used by the researchers where he designed the questionnaire by generating a list of items, which solicited students' response setting. The specifics for each of the two data collection instruments used in the study of Aduwa Ogiegbaen, S.E. Iyamu, and E.O.S., follows:

- **Questionnaire:** This instrument dealt with four sections – college type and location; instructional resources/media used by the teachers frequently, methods teachers frequently adopted for teaching English language, and the school environment.
- **Observation:** Research assistants were trained to observe each classroom and some classroom proceedings during administration of the questionnaire noting the features or characteristics of the learning environment.

Determining Sample Design

Sample designing finds out a small portion of some problem, attitude or issue and then represent an overall scenario as it is at the time of study. The selection process of units for study represents the whole. It makes possible the study of various phenomena's. When a chance is given to individual being who sampled independently of each other. This is known as random sampling.

- **Sampling**

For practical and cost reasons most statistical studies are based on samples taken out of the entire population of people or things in which researchers are interested. Selection of samples depends on what method the researcher uses. Sampling may be a:

  - **Simple Random Sampling:** The basic type of random in which each person or item has an equal chance of being chosen;
  - **Stratified Random Sampling:** Sampling of each stratum separately to increase precision, or reduces time, effort and cost of allowing smaller sample sizes for a given level of precision;
  - **Multi-stage Sampling:** For widely dispersed populations. As a general rule, the larger is the size of the sample the smaller the standard error; and
  - **Area Sampling:** small areas designated as sampling units.

- **Tools for Data Collection**

The construction of a research instrument or tool for data collection is the most important aspect of a research project because anything a researcher says by way of findings or conclusions is based upon the type of information he collects, and the data he collects is entirely dependent upon the questions that he asks of his respondents. While preparing the questionnaire, the researcher has ensured the validity of instrument by making sure that his questions relate to the objectives of his study. The researcher has clearly defined and individually listed all the specific objectives or research questions for his study. For each objective or research questions, he has listed all the associated questions that he wanted to answer through his study. The Questionnaire developed by the researcher is a combination of both closed ended questions which include all possible answers/prewritten response categories, and respondents are asked to choose among them, and open-ended questions that allow respondents to answer in their own words.

- **Collecting Data**

Having formulated the research problem, developed a study design, constructed a research instrument and selected a sample, the researcher then collected the data from which he drew inferences and conclusions for his study. Depending upon his plans, he commenced interviews, mailed out a questionnaire, conducted experiments and made observation.

- **Techniques of Data Collection**

To collect reliable and impartial scientific data, numerous methods are used in order to minimize errors. According to 'Sociology Journal' some of the commonly used sources in collecting data are:

  - Existing materials including the official statistical record and historical and contemporary documents.
  - Social surveys through questionnaire and schedules
  - Interviewing
  - Observation- Participants and non-participant

- **Processing of Data**

Processing of data involves a number of closely related operations which are performed with the purpose of summarizing the collected data and organizing these in a manner that they answer the research questions (objectives). The Data Processing operations include editing and classification.

Data can be analyzed on the basis of common characteristics which can either be descriptive or numerical. Tabulation may also be classified as simple and complex tabulation. Simple tabulation generally results in one-way tables which supply answers to questions about one characteristic of data only. Complex tabulation usually results on two-way tables, three –way tables or still higher order tables, also known as manifold tables.

Data Analysis Methods and Interpretation

Data analysis is a technique for the systematic, objective and quantitative description of the content of research data procured through interviews, questionnaires, schedules and other linguistic expressions, written or oral. The researcher has used both Qualitative and Quantitative methods for the analysis of his data. The collected data were analyzed using simple percentages, charts and graphs. Qualitative results in the sense that it is the basis of graphic illustrations such as pie chart, bar chart and histogram.

The purpose of assembling data is to present some theoretical analysis or interpretation of it. But the processes of observation and analysis are rarely independent of one another. Data analysis involves seeking for observations with object of determination in available circumstances.

Problems Faced by the Researcher

For the success of any scientific research, it is very important to select such tools which could collect the information reliably and objectively. Two important things- the method of data collection and appropriate tools to measure the given phenomenon quantitatively while analyzing the underlying relationships between different aspects of given phenomenon are the backbone of any research work. In spite of being a time-consuming process of data collection, it is preferred to other methods because it provides rich and reliable data. The collection of data by the researcher was not easy. It was really a rigorous task to convince most of the heads of institutions as well as respondents to cooperate in the process of data-collection. To collect information without the knowledge of the participant, and their expressed willingness and informed consent was unethical. So, the respondents were made adequately aware of the type of information he wanted from them, why the information was being sought, what purpose it will be put to, how they were expected to participate in the study, and how it will directly or indirectly affect them. The researcher made every possible effort to get voluntary consent for this. In collecting data the researcher was all conscious of the sensitivities of his respondents and so, he tried to avoid any sort of possibility of causing harm to participants where harm includes hazardous experiments, discomfort, anxiety, harassment, invasion of privacy, or demeaning or dehumanizing procedures. The researcher has maintained confidentiality and kept the information provided by respondents anonymous.

References

- Aduwa Ogiegbaen, S.E. Iyamu, E.O.S. “Factors affecting quality of English language teaching and learning in secondary schools in Nigeria.” College Student Journal**.** Project Innovation. Alabama.
- Baskerville R. Risk Analysis as a Source of Professional Knowledge. Computers & Security. (1991). 10 (8): 749–764.
- Concise Oxford English Dictionary. 8eds. Oxford University Press. 18 August 2011.
- Du Plooy G. M., ed. Introduction to Communication. 1995.
- Einstein and Enfield. The Evolution of Physics. New York. (1983).
- Paul Brunton. Science Notebooks of wisdoms goldenrod. <http://wisdomsgoldenrod.org/notebooks/para/10268>
- Pearson Karl. The Grammar of Science. London. Google book search. 2007. Pg. 17. Print.
- Sociology Journal. “Research Methods and Statistics.” Sociology Guide.Com Site Designed, Developed and Maintained by Concern Info tech Pvt. Ltd. SEO Expert Chennai.
- Wiersma William and Jurs, Stephen G., Research Methods in Education. 2009. <http://books.google.co.in/books/about/Research_methods_in_education.html?id=3M9XAAAAYAAJ&redir_esc=y>.

☯☯☯