OPEN ACCESS
Scholars Bulletin
Abbreviated Key Title: Sch Bull
ISSN 2412-9771 (Print) |ISSN 2412-897X (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Subject Category: Zoology

Glance of Research Methodology for Researchers: A Logical Assessment

Attied Khawar Balwan[1], Wahied Khawar Balwan[2*], Neelam Saba[3]

[1]Department of English, Govt. Degree College Samba, UT of Jammu & Kashmir, India
[2]Assistant Professor & Head, Department of Zoology, Govt. Degree College Kilhotran, UT of Jammu & Kashmir, India
[3]Department of Zoology, Govt. Degree College Doda, UT of Jammu & Kashmir, India

DOI: 10.36348/sb.2022.v08i03.004 | **Received:** 09.02.2022 | **Accepted:** 14.03.2022 | **Published:** 16.03.2022

***Corresponding author:** Wahied Khawar Balwan
Assistant Professor & Head, Department of Zoology, Govt. Degree College Kilhotran, UT of Jammu & Kashmir, India

Abstract

Research is one of the means by which we seek to discover the truth. It is based upon the tacit assumption that the world is a cosmos whose happenings have causes and are controlled by forces and relationships that can be expressed as laws and principles. Discovery of these controls of nature provides us with a hunting license to search for ways of controlling our environment. To search for truth in a scientific way research methodology provides principles to refine our common beliefs through research activity that establishes rules of logical and appropriate reasoning. In order to apply the scientific research methodology properly in research work, the researcher must have a clear basic concept of research methodology & methods that will ensure to find potential research results. This paper deals with the conceptuality of the research methodology like the meaning of the research, objectives of research, motivation in research and types of research. The basic approaches to research, research methods versus methodology, research process i.e. formulation of the research problem, extensive literature survey, development of working hypotheses, preparing the research design, execution of the project, analysis of the data, hypothesis-testing, generalizations and interpretations and preparation of the report have also been described along with the criteria of good research and problems encountered by researchers in India.

Keywords: Research, Principles, Conceptuality Literature, Hypothesis, Project.

INTRODUCTION

Research teaches scientifics and inductive considering. Research likewise advances the improvements of propensities for sensible considering and association. It gives the premise to about all administration approaches in our monetary framework. All the progress in the society is born of inquiry. Doubt is often better than over confidence, for it leads to inquiry and inquiry leads to invention. Thus an increased amount of inquiry makes research possible. Research inculcates scientific and inductive thinking. Research also promotes the development of habits of logical thinking and organization. It provides the basis for nearly all government policies in our economic system. As a matter of fact, the role of research in several fields of applied economics, whether related to business or to economy as a whole, has greatly increased. Research has its special significance in solving various operational and planning problems of business and industry. Research is equally important for social scientists in studying social relationships and in seeking answers to various social problems. Likewise, in every field of science, the research plays a significant role in providing the intellectual satisfaction of knowing a few things just for the sake of knowledge and also has practical utility for the scientists and engineers to know for the sake of being able to do something better or in a more efficient manner [1, 9, 10].

The Research Methodology refers to the systematic and theoretical analysis of the research methods applied to a field of study that combine the techniques and approaches of the used tools for conducting a scientific research study. Therefore, the Basic Concept of Research Methodology is defined as a highly intellectual human activity used in the investigation of social phenomena, nature, and matter that deals especially with the manner in which data is collected, analyzed, and interpreted for a scientific research project. Indeed, the part of research in a few fields of connected financial aspects, regardless of whether identified with business or to economy in

general, has extraordinarily expanded. Research has its exceptional hugeness in taking care of different operational and arranging issues of business and industry. Research is equally important for social scientists in studying social relationships and in seeking answers to various social problems. Likewise, in every field of science, the research plays a significant role in providing the intellectual satisfaction of knowing a few things just for the sake of knowledge and also has practical utility for the scientist and engineers to know for the sake of being able to do something better or in a more efficient manner [10, 11].

On account of the afore-mentioned facts, authors have given their contributions in order to improve the concepts of research methodology. Researchers have laid emphasis on the challenges which the present research methodology is faced with towards the maintenance and sustenance of its quality [2, 9], implementation aspect of any research by way of proposing a heuristic and working taxonomy of eight conceptually distinct implementation outcomes such as acceptability, adoption, appropriateness, feasibility, fidelity, implementation cost, penetration and sustainability [3], multiple qualitative studies for enhancing transparency in reporting the synthesis of quality research by way of generating new theoretical and conceptual models [4].

Research is an academic activity that comprises defining and redefining problems; formulating hypotheses; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at least carefully testing the conclusions to determine whether they fit the formulating hypotheses. They have defined research as manipulation of things, concepts or symbols for the purpose of generalising to extend, correct or verify knowledge [1]. Research is thus an original contribution to the existing treasure of knowledge. It is the pursuit of truth with the help of study, observation, comparison and experiment. Research refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analysing the facts and reaching certain conclusions in the form of solutions towards the concerned problem. In fact, research is an art of scientific investigation leading to a systematic search for pertinent information on a specific topic [12, 13].

OBJECTIVES OF RESEARCH

The purpose of any research is to discover answers to questions through the application of scientific procedures [9, 10]. The main objective of research is to find out the truth which is hidden and which has not been discovered as yet. The main objectives of the research fall into the following groupings:

1. **Exploratory or Formulative Research Studies**: The main objective of this kind of research is to gain familiarity with a phenomenon or to achieve new insights into it.
2. **Descriptive Research Studies**: The main objective of this kind of research is to portray accurately the characteristics of a particular individual, situation or group.
3. **Diagnostic Research Studies**: The main objective of this kind of research is to determine the frequency with which something occurs or with which it is associated with something else.
4. **Hypothesis-Testing Research Studies**: The main objective is to test a hypothesis of a causal relationship between variables.

MOTIVATION IN RESEARCH

The motivation behind any research is of fundamental significance. Some of the motives for doing research may be one or more of the following:

1. Desire to get a research along with its consequential benefits
2. Desire to face the challenges in solving the unsolved problems
3. Desire to get intellectual joy of doing some creative work
4. Desire to be of service to society
5. Desire to get respectability
6. Directives of the government
7. Employment conditions
8. Curiosity about new things
9. Desire to understand causal relationships, social thinking and awakening.

However, this is not an exhaustive list of motives to undertake research, there may be many more such motives which may motivate or at times compel people to undertake research.

TYPES OF RESEARCH

The basic types of research are:

i) Descriptive Vs. Analytical

Descriptive research includes surveys and fact finding enquires of different kinds. The main objective of a descriptive research is the description of the state of affairs as it exists at present. The main characteristic of this kind of research is that the researcher has no control over the variables. The researcher can only report as to what has happened or what is happening. This kind of research is also called Expost facto research in social science or business research. In this kind of research, the researchers also try to find the causes even when they cannot control the variables. In descriptive research, the researchers use survey methods of all kinds, including comparative and correlational methods. In analytical research, on the contrary, the researcher has to use facts or information already available. The

researcher analyses the information to do a critical evaluation of the material.

(ii) Applied vs. Fundamental

The research can either be applied or fundamental. An applied research aims at finding a solution for an immediate problem facing a society or industrial/business organization. The fundamental research, on the other hand, is mainly concerned with the formulation of theory. The fundamental research is also called 'pure' or 'basic' research. According to the researcher gathers knowledge for knowledge's sake [5]. Research concerning some natural phenomenon or relating to pure mathematics are examples of fundamental research. The research studies concerning human behaviour to make generalizations about human behaviour are also the examples of fundamental research. The research aimed at certain conclusions or solutions facing a concrete social or business problem is an example of applied research.

(iii) Quantitative vs. Qualitative

The quantitative research is based on the measurement of quantity or amount. It is applicable to phenomenon that can be expressed in terms of quantity. Qualitative research, on the other hand, is concerned with qualitative phenomena e.g. reasons for human behaviour, motivation research, etc. Motivation research aims at discovering the underlying motives and desires. This kind of research uses in-depth interviews, word association tests, sentences completion tests, story completion tests and similar other projective techniques. The qualitative research is especially important in the behavioural sciences where the aim is to discover the underlying motives of human behaviour. The qualitative research is relatively a difficult job and therefore one should seek guidance from experimental psychologists while doing research.

(iv) Conceptual vs. Empirical

The conceptual research is related to some abstract ideas or theory. It is generally used by philosophers and thinkers to develop new concepts or to interpret existing ones. On the other hand, empirical research relies on experience and observation alone. This does not give due regard for the system or theory. It is a data-base research. This research comes up with conclusions verifiable by observations and experiments. This is infact an experimental type of research in which it is necessary to get at facts first hand, at their source, and actively to go about doing certain things to stimulate the production of desired information. Empirical research, on the other hand, is appropriate when proof is sought that certain variables affect other variables in some way. Evidence gathered through experiments or empirical studies is today considered to be the most powerful support possible for a given hypothesis.

RESEARCH APPROACHES

The afore-mentioned types of research bring to light the fact that there are two basic approaches to research, viz., quantitative approach and qualitative approach. The former involves the data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion. This approach can further be classified into inferential, experimental, and simulation approaches to research.

The purpose of inferential approach to research is to form a database from which to infer characteristics or relationships between various parameters affecting the quality of the product, process and service. Experimental approach is characterized by much greater control over the research environment, and in this case some variables are manipulated to observe their affect on other variables. The analytical approach is used specially in science and engineering to find out 6 solutions of the problems. Simulation approach involves the construction of an artificial environment within which relevant information and data can be generated. This permits an observation of the dynamic behaviour of the system under controlled conditions. Simulation approach can also be useful in building models for understanding future conditions [11-13].

Qualitative approach to research is concerned with subjective assessment of attitudes, opinions and behaviour. Research in this situation is a function of researcher's insights and impressions. Such an approach to research generates results either in non-qualitative form or in the form which are not subjected to rigorous quantitative analysis. In qualitative approach, the techniques of focus group interviews, projective techniques and depth interviews are used.

RESEARCH METHODS AGAINST METHODOLOGY

There is a difference between research methods and research methodology. Research methods may be understood as those methods/techniques that are used in the conduct of the research. Research methods or techniques thus refer to the methods the researchers use in performing research operations. In this way, all those methods which are used by the researcher during the course of studying the research problem are termed as research methods.

Research methodology, on the other hand, is a wider concept. It is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it, we study the various steps that are generally adopted by a researcher in studying his research problem alongwith the logic behind them. It is, therefore, necessary for the researcher to know not only the research methods/techniques but also the methodology. Researchers need to understand the assumptions

underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not. All this means that it is necessary for the researcher to design his methodology for his problem as the same may differ from problem to problem [8, 11-13].

Thus the scope of the research methodology is wider than that of research methods. In research methodology, the researcher not only talks of the research methods but also considers the logic behind the methods he uses in the context of his research study and explains as to why is he using a particular method or technique.

RESEARCH PROCESS

Research process consists of a series of actions or steps necessary to effectively carry out research and desired sequencing of these steps. A brief description of the research process is as follows:

1. Formulating the Research Problem

At the very outset, the researcher must single out the problem he wants to study; i.e., he must decide the general area of interest or aspect of subject matter that he would like to inquire into. Initially, the problem may be stated in a broad general way and then ambiguities, if any, relating to the problem be resolved. Then, the feasibility of a particular solution has to be considered before a working formulation of the problem can be set up. Essentially two steps are involved in formulating the research problem; viz., understanding the problem thoroughly and rephrasing the same into meaningful terms from an analytical point of view.

2. Extensive Literature Survey

Once the problem is formulated, the brief summary of it should be written down. It is compulsory for a research worker writing a thesis for a Ph.D. degree to write a synopsis of the topic and submit it to the necessary Committee or Research Board for approval. At this juncture, the researcher should undertake extensive literature survey connected with the problem. For this purpose, the abstracting and indexing journals and published or unpublished bibliographies are the first place to go. Academic journals, conference proceedings, government reports, books, etc. must be tapped depending on the nature of the problem [11, 12].

3. Development of Working Hypothesis

After extensive literature survey, researcher should state in clear terms the working hypothesis or hypotheses. Working hypothesis is tentative assumption made in order to draw out and test its logical or empirical consequences. Research hypotheses are developed to provide the focal point of the research. The hypotheses also affect the manner in which the tests must be conducted in the analysis of the data, and indirectly the quality of the data which is required for the analysis. The hypotheses should be very specific and limited to the piece of research in hand because it has to be tested.

4. Preparing the Research Design

The research problem having been formulated in clear cut terms, the researcher will be required to prepare a research design; i.e., he will have to state the conceptual structure within which the research would be conducted. The preparation of such a design facilitates research to be as efficient as possible yielding maximal information. In other words, the function of the research design is to provide for the collection of relevant evidence with minimal expenditure of effort, time and money. But how all these can be achieved depends mainly on the research purpose. The research purposes may be grouped into four categories namely Exploration, Description, Diagnosis and Experimentation. A flexible research design which provides opportunity for considering many aspects of a problem is considered appropriate if the purpose of the research study is that of exploration. But when the purpose happens to be an accurate description of a situation or of an association between variables, the suitable design will be the one that minimizes bias and maximizes the reliability of the data collected and analysed.

5. Execution of the Project

The execution of the project is a very important step in the research process. If the execution of the project proceeds on correct lines, the data to be collected would be adequate and dependable. The researcher should see that the project is executed in a systematic manner and in time.

6. Analysis of Data

After the data have been collected, the researcher turns to the task of analyzing them. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inferences.

7. Hypothesis Testing

After analyzing the data as stated above, the researcher is in a position to test the hypotheses, if any, he had formulated earlier. Do the facts support the hypotheses or they happen to be contrary is the usual question which should be answered while testing the hypotheses.

8. Generalisations and Interpreation

If the hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalization; i.e., to build a theory. As a matter of fact, the real value of the research lies in its ability to

arrive at certain generalisations. If the researcher has no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as interpretation. The process of interpretation may quite often trigger of new question which in turn may lead to further researches.

9. Preparation of the Report or the Thesis

Finally, the researcher has to prepare the report of what has been done by him. Writing of the report must be done with great care keeping in view the following:

(A) The layout of the report should be as follows:

i. The preliminary pages
ii. The main text and
iii. The end matter. In the preliminary pages, the report should carry title and date followed by acknowledgements and foreword.

The main text of the report should have the following parts:

a. **Introduction**: It should contain a clear statement of the objective of the research and an explanation of the methodology adopted in accomplishing the research. The scope of the study along with various limitations should as well be stated in this part.
b. **Summary of Findings**: After introduction there would appear a statement of findings and recommendations in non-technical language. If the findings are extensive, they should be summarized.
c. **Main Reports**: The main body of the report should be presented in logical sequence and broken down into readily identifiable sections.
d. **Conclusion**: Towards the end of the main text, the researcher should again put down the results of his research clearly and precisely. In fact, it is final summing up.

At the end of the report, appendices should be enlisted in respect of all technical data. Bibliography, i.e. list of books, journals, reports, etc. consulted, should also be given in the end. Index should also be given specially in a published research report.

(B) The report should be written in a concise and objective style in simple language avoiding vague expressions such as 'it seems', 'there may be', and the like.

(C) Charts and illustrations in the main report should be used only if they present the information more clearly and forcibly.

STANDARDS OF GOOD RESEARCH

Whatever may be the types of research works and studies, one thing that is important is that they all meet on the common ground of scientific methodology employed by them. One expects scientific research to satisfy the following criteria [7].

1) The purpose of the research should be clearly defined and common concepts be used.
2) The research procedure should be defined in sufficient detail.
3) The procedural design of the research should be carefully planned to yield results that are as objective as possible.
4) The analysis of the data should be sufficiently adequate to reveal its significance and the methods of analysis should be appropriate. The validity and reliability of the data should be checked carefully.
5) Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.

In other words, the qualities of a good research [8][11][12] are as under:

1) **Good Research is Systematic**: It means that the research is structured with specified steps to be taken in a specified sequence in accordance with the well-defined set of rules.
2) **Good Research is Logical**: This implies that the research is guided by the rules of logical reasoning and logical process of induction and deduction are of great value in carrying out research. Induction is the process of reasoning from a part to the whole whereas deduction is the process of reasoning from some premise to a conclusion which follows from that very premise. In fact, logical reasoning makes research more meaningful in the context of decision making.
3) **Good Research is Empirical**: It means that the research is related basically to one or more aspects of a real situation and deals with concrete data that provides a basis for external validity to research results.
4) **Good Research is Replicable**: This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

CONCLUSION

Researchers in India are facing several problems while pursuing their research. The lack of scientific training in the methodology of research is a great impediment for researchers in our country. There is a paucity of competent researchers in our country. Many researchers take a loop in the dark without knowing the research methods. Also there is an insufficient interaction between the university research departments on one side and industrial/business/government departments and research institutions on the other side. So, efforts should be made to develop satisfactory liaison among all concerned for better and realistic researches. The library management and functioning is not satisfactory at many

places and much of the time and energy of researchers are spent in tracing out books, journals, reports, etc. So, for quality research, all these problems are required to be eliminated from our research organizations.

Conflict of Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

REFERENCES

1. Slesinger, D., & Stephenson, M. (1930). The Encyclopaedia of Social Sciences. IX (250): MacMillan Publications.
2. Ho, D. G. (2006). *The focus group interview*. Australian review of applied linguistics, 29(1), 5-1.
3. Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A. l., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Adm Policy Ment Health*, 38(2), 65-76.
4. Tong, A., Flemming, K., McInnes, E., Oliver, S., & Craig, J (2012). Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Medical Research Methodology*, 12(1), 181.
5. Young, P. V. (1953). Scientific Social Surveys and Research. New York: Pzentice-Hall Inc., 1949. 621 pages. Nursing Research, 2(2), 95.
6. Meier, R. C., Newell, W. T., & Pazer, H. L. (1969). *Simualtion in Business and Economics* [by] Robert C. Meier, William T. Newell [and] Harold L. Pazer. Prentice-Hall.
7. Fox, J. H. (1958). Criteria of good research. *The Phi Delta Kappan*, 39(6), 284-286.
8. Bellenger, D. N., & Greenberg, B. A. (1978). Marketing Research-A Management information approach. Homewood, Illinois: Richard, D. Irwin p.107.
9. Singh, B. B., & Guled, C. N. (2016). Conceptuality of research methodology: Some introductory remarks. *Everyman's Science*, 156-162.
10. Nia, F. H., & Niavand, H. (2017). A Glance of Business Research Methodology for Researchers. *Journal of Business*, *5*(2), 62-66.
11. Saba, N., & Balwan, W. K (2021). Decoding the role in Memory and other learning activities. *Journal of Chemical, Physical and Biological sciences*, 11(4), 594-602.
12. Balwan, A. K., & Balwan, W. K. (2021). Language and Thought: The Chicken and Egg Syndrome. *The Journal of Oriental Research Madras*, P95-99.
13. Balwan, W. K., & Saba, N. (2021). Gnotobiotic Animals in Life Science Research. *Elementary Education Online*, *20*(1), 1944-1946.