

# Problem Identification

## *Problem Identification*

There are countless problems with family planning and health programs. Finding a problem is not hard, but identifying one for the purpose of research is not always easy. One of the most important tasks of research is to identify and define clearly the problem you wish to study. If you are uncertain about the research problem, if you are not certain in your own mind about what you want to study, you may be sure that others who read your proposal will also be uncertain. A well-defined problem leads naturally to the statement of research objectives, to the hypotheses, to a definition of key variables, and to a selection of a methodology for measuring the variables. A poorly defined research problem leads to confusion.

All research is set in motion by the existence of a problem. A problem is a perceived difficulty, a feeling of discomfort with the way things are, a discrepancy between what someone believes **should be** and **what is**. While problems are the initiating force behind research, not all problems require research. A potential research situation arises when three conditions exist:

- 1 A perceived **discrepancy** between what is and what should be.
- 2 A **question** about why the discrepancy exists.
- 3 At least **two possible and plausible answers** to the question.

The last point is important. If there is only one possible and plausible answer to the question about the discrepancy, then a research situation does not exist. Consider the example given below.

### *1 Example of a Nonresearch Problem*

**Problem Situation:** A recent survey in District A found that 1,000 women were continuous users of contraceptive pills. But last month's service statistics indicate that none of these women are using contraceptive pills.

**Discrepancy:** All 1,000 women **should be using** contraceptive pills, but all 1,000 women **are not using** contraceptive pills.

**Problem Question:** What factor or factors are responsible for 1,000 women discontinuing their use of contraceptive pills?

**Answer:** A monsoon flood has prevented all new supplies of pills reaching District A, and all old supplies have been exhausted.

In the above example, a problem situation exists, but the reason for the problem is already known. Therefore, assuming that all the facts are correct, there is no reason to conduct research on the factors associated with pill discontinuation among the 1,000 women. On the other hand, there may very well be a need to conduct research on the question of why the supply and logistics system is incapable of providing contraceptives to women during the monsoon. Study the next example.

## 2 Example of a Research Problem

**Problem Situation:** District A is always flooded during the monsoon season. Recognizing this problem, the national family planning program established a new supply logistics system for the district. Each pill user is given a four-month supply before the monsoon begins. During the monsoon, small motorboats are available to transport new supplies to selected distribution centers accessible to village-level family planning workers. Despite these new measures, this year service statistics indicated that there are no pill supplies in District A.

**Discrepancy:** The new logistics system **should be able** to assure a continuous supply of pills, but this year **there are no supplies**.

**Problem Question:** Why has the new supply logistics system been incapable of delivering contraceptive pills to users?

**Possible Answers:**

- 1 An order for new pill supplies was not placed in time before the monsoon rains.
- 2 The riverboats used to transport the supplies are out of order.
- 3 Field-workers were not told about the new system and failed to give users a four-month supply of pills before the monsoon.

In this example, there are several possible and plausible reasons for the problem situation. One or more of these reasons might be correct. Therefore, this is a potential research situation.

In some situations, it is relatively easy to identify the problem, to define it, to hypothesize the reasons for it, and to conduct research to determine which reason is correct or more nearly correct. The reasons for the supply and logistics problem in the above example could probably be determined fairly easily and certainly would not require an expensive research study. Other problems, such as the one in the next example, are not so easy to identify or to study.

## 3 Example of a Research Problem

**Problem Situation:** A recent family planning survey revealed great differences between villages in the rate of contraceptive prevalence. Despite the fact that all villages receive the same level of health and family planning services, some villages have a prevalence rate as high as 80 percent, while others have a rate as low as 6 percent.

**Discrepancy:** All villages **should have** approximately the same rate of contraceptive prevalence, but in fact **there is great variation** between villages.

**Problem Question:** What factors are responsible for the areal variation in contraceptive prevalence rates?

**Possible Answers:**

- 1 Villages differ in their socioeconomic environments. Some villages are agricultural; some are fishing communities. Some villages are Hindu; others are predominantly Muslim or Buddhist. Some villages have access to markets in towns; others do not. Some villages have schools, health clinics, electricity, and a good water supply; others do not have these facilities. These socioeconomic differences affect the level of contraceptive practice.
- 2 Villages differ in institutional support for contraceptive acceptance. In some villages, local influentials strongly support the national family planning program. In other villages, they do not support it. In some villages, there are active Mothers' Clubs that support family planning. In other villages, there are

- no Mothers' Clubs. These differences in institutional support for family planning affect the level of contraceptive practice.
- 3** Village-level health and family planning workers differ in their effectiveness. Some workers are highly motivated and very active in their assigned areas. Other workers are less motivated and less active. These differences in worker effectiveness affect the level of contraceptive practice.

While the problem situation presented above is fairly clear, the reasons for the problem are complex. Three reasons have been given, but it is likely many more could be stated. In situations such as this, the researcher must devote considerable time and attention to identifying the problem situation. The aim is to focus the research on the most important aspects of the problem.

# **An Introduction to Research Methodology**

## **Meaning of Research**

Research may be defined as systematic gathering of data and information and its analysis for advancement of knowledge in any subject. Research attempts to find answer of intellectual and practical questions through application of systematic methods. Webster's Collegiate Dictionary defines research as "studious inquiry or examination; esp: investigation or experimentation aimed for the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws". Some people consider research as a movement, a movement from the known to the unknown.

We all possess the vital instinct of inquisitiveness for, when the unknown confronts us, we wonder and our inquisitiveness makes us probe and attain full and fuller understanding of the unknown. This inquisitiveness is the mother of all knowledge and the method, which man employs for obtaining the knowledge of whatever the unknown, can be termed as research.

Research is an academic activity and as such the term should be used in a technical sense. According to Clifford Woody research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis. D. Steiner and M. Stephenson in the Encyclopedia of Social Sciences define research as "the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art."

Research is, thus, an original contribution to the existing stock of knowledge making for its advancement. It is the pursuit of truth with the help of study, observation, comparison and experiment. In short, the search for knowledge through objective and systematic method of finding solution to a problem is research. The systematic approach concerning generalization and the formulation of a theory is also research. As such the term 'research' refers 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 the form of solutions(s) towards the concerned problem or in certain generalizations for some theoretical formulation.

## **Objectives of Research:**

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies);
2. To portray accurately the characteristics of a particular individual, situation or a group(studies with this object in view are known as descriptive research studies);
3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies);
4. To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

### **Utility of Research**

It has been observed that research is of extensive use for a manager in planning, forecasting, coordinating, motivating, controlling, decision- making, etc. While managerial research helps in managerial analysis, academic research helps in academic objectives. Utility of social research includes social prediction, social enlightenment social welfare, social growth, social cohesion, social control, improving and perfecting the tools of social research, etc..

Utility of research can be summed up as:

- a) Research is an aid to decision-making.
- b) Research facilitates the process of thinking, analysis, evaluation, and interpretation of the business environment; and of the various business situations.
- c) Research provides a basis for innovation.
- d) Research and development helps to develop new products and to modify the existing products.
- e) Research identifies problem areas.
- f) Research establishes the relationship not only between variables in each functional area, but also between the various functional areas.
- g) Research is an aid to forecasting, which is an effective tool in the hands of managers.
- h) Research helps all the managerial functions.
- i) Research helps in the economic utilization of resources
- j) Market and marketing analysis may be based on research.
- k) Research is an aid to management information systems and
- l) Research is helpful in the formulation of policy and strategy.

### **Research Methods**

Research methods may be understood as all those methods/techniques that are used for conduction of research. Research methods or techniques, thus, refer to the methods the researchers use in performing research operations. In other words, all those methods

which are used by the researcher during the course of studying his research problem are termed as research methods. Since the object of research, particularly the applied research, is to arrive at a solution for a given problem, the available data and the unknown aspects of the problem have to be related to each other to make a solution possible. Keeping this in view, research methods can be put into the following three groups:

1. In the first group we include those methods which are concerned with the collection of data. These methods will be used where the data already available is not sufficient to arrive at the required solution;
2. The second group consists of those statistical techniques which are used for establishing relationships between the data and the unknowns;
3. The third group consists of those methods which are used to evaluate the accuracy of the results obtained.

**Research methodology** 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 along with the logic behind them. It is necessary for the researcher to know not only the research methods / techniques but also the methodology. Researchers not only need to know how to develop certain indices or tests, how to calculate the mean, the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques are relevant and which are not, and what would they mean and indicate. Researchers also 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 a methodology for his problem as the same may differ from problem to problem. For example, an architect, who designs a building, has to consciously evaluate the basis of his decisions, i.e., he has to evaluate why and on what basis he selects particular size, number and location of doors, windows and ventilators, uses particular materials and not others and the like. Similarly, in research the scientist has to expose the research decisions to evaluation before they are implemented. He has to specify very clearly and precisely what decisions he selects and why he selects them so that they can be evaluated by others also.

From what has been stated above, we can say that research methodology has many dimensions and research methods do constitute a part of the research methodology. The scope of research methodology is wider than that of research methods. *Thus, when we talk of research*

*methodology we not only talk of the research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others so that research results are capable of being evaluated either by the researcher himself or by others.* Why a research study has been undertaken, how the research problem has been defined, in what way and why the hypothesis has been formulated what data have been collected and what particular method has been adopted, why particular technique of analyzing data has been used and a host of similar other questions are usually answered when we talk about research methodology concerning a research problem or study.

### **Need of Research Methodology**

It is necessary for a researcher to design a research methodology for the problem chosen. One should note that even if the research method considered for two problems are the same the research methodology may be different. It is important for the researcher to know not only the research methods necessary for the research undertaken but also the methodology. For example, a researcher not only needs to know how to calculate the mean, variance, and distribution function for a set of data, how to find a solution to a physical system described by a mathematical model, how to determine the roots of algebraic equations and how to apply a particular method but also need to know (i) which is a suitable method for the chosen problem?, (ii) what is the order of accuracy of the result of a method?, (iii) what is the efficiency of the method? And so on. Considerations of these aspects constitute a research methodology. More precisely, research methods help us get a solution to a problem. On the other hand, the research methodology is concerned with the explanation of the following:

1. Why is a particular research study undertaken?
2. How did one formulate a research problem?
3. What types of data were collected?
4. What particular method has been used?
5. Why was a particular technique of analysis of data used?

The study of research methods gives the training to apply them to a problem. The study of research methodology provides us with the necessary training in choosing research methods, materials, scientific tools, and training in techniques relevant to the problem chosen.



## **Deduction: Testing Theory**

Deduction is the research approach used to test a theory. It involves the development of a theory that is subjected to a rigorous test. The stages involved in such research are:

- a) deducing a hypothesis from the theory ,
- b) expressing the hypothesis in operational terms ,
- c) testing the operational hypothesis ,
- d) examining the specific outcomes of the enquiry , and
- e) Modifying the theory in the light of the findings, if necessary.

An attempt is thus made to verify the revised theory by going back to the first step and repeating the whole cycle

## **Induction: Building Theory**

In this approach, the researcher tries to understand the nature of the problem, gather the required quantitative and qualitative data, and analyze them to draw conclusions. Hence, developing an understanding about the problem and making proper analysis of its different dimensions are the strengths of inductive research. The result of this analysis would be the formulation of a theory. Thus, in an inductive approach, theory is built from the empirical evidences gathered through different sources. In deductive approach, data would follow a theory.

## **Characteristics of a Scientific Method:**

The chief characteristic of a scientific method are:

**1. Verifiability:** The conclusion drawn through a scientific method is subjected to verification at any time. The preposition is that the phenomenon under investigation must be capable of being observed and measured. In case direct observation could not be done, other methods such as interview can be utilized for verification. For instance, two man's order of preference for various jobs, although incapable of being observed can still be verified by means of an interview.

**2. Generality:** Laws derived through scientific method are universal in their applications. They are not limited to individual objects or individual groups of objects. The individual groups or objects considered as specimen or instances, and there are relationships discovered through these individual groups should be applicable to whole group called Universe.

**3. Predictability:** Another characteristic of a Scientific method is that its results can be predicted with sufficient accuracy. For example, we can say with certainty that if water is heated to 100°C, it will vaporize, and if it is cooled to 0°C, it will turn to ice. Also we can say that if an unbiased coin is tossed 500 times, head will turn about 250 times. Predictability is fixed on two factors i.e. fixing of relationship between the cause and the effect and the stability of causative factors.

**4. Objectivity:** The results obtained through a scientific method should be free from investigator's own views, wishes or prevalent notions i. e., they must be subjected to objective observations. The main criterion of objectivity is that all persons should arrive to the same conclusion about the phenomenon. For example, when we say Coal is black, it is objective statement because coal will appear black to all people. But when we say Coal is useful mineral, the statement may not be objective, for every one may not agree to the statement.

**5. System:** In every scientific study, there is an accepted mode of investigation. The result arrived true, at by means of a haphazard method, even true, cannot be called scientific because its accuracy is purely accidental.

## **Types of Research**

Research can be divided into two broad types relative to its purposes; applied and fundamental

### **1. Applied Research**

Applied research is conducted in response to a specific problem, which requires a solution. The major purpose of applied research is to answer practical and useful questions about policies programs, projects, procedures, or organizations. Business executives, therefore, take interest in applied research. They often hire outside researchers and consultants to study a problem of concern to them in order to find solutions that can be implemented to rectify the problem situation

As applied research is concerned with knowledge that has immediate applications, it is also called decisional research. The attempt to get a cure for Bird Flu is a case in point.

**EXAMPLE:** *The Dairy Development Corporation (DDC) has to improve its productivity in order to remain competitive in the market. There are two alternative strategies to improve its productivity. One is to pay attention to all of its existing brands and make continuous improvement; the other is to focus on new brand development. Each of these alternatives has some advantages and disadvantages. The Corporation will now have to research into each of these strategies and see which one would best be suitable to it, taking into account its capabilities, know-how, resources and so on.*

The above example indicates the need for an applied research to work out a strategy in view of the strengths and weaknesses of the DDC. Applied research is thus more concerned with knowledge that has immediate application and would be useful in making decisions and formulating policies.

The defining quality of applied research is that the researcher attempts to conduct a study whose

results can be applied directly to a specific situation. To accomplish this task, the researcher must choose a research strategy that maximizes the applicability of findings. Applied research often results in recommendations on decisions or actions.

## **2. Fundamental Research**

Fundamental research is undertaken to improve our understanding of certain problems that commonly occur in organizational setting, and how to solve them. It is undertaken for the sole purpose of adding to our knowledge that is fundamental and generalizable. It is conducted without any practical end-use in mind. It is also known as pure or basic research.

The purpose of fundamental research is not to apply the findings to solve an immediate problem at hand, but rather to generate more knowledge and understanding of the phenomena and problems that occur in several organizations, and to build theories based on the research results. Such theories subsequently become the foundation for further study of the phenomena.

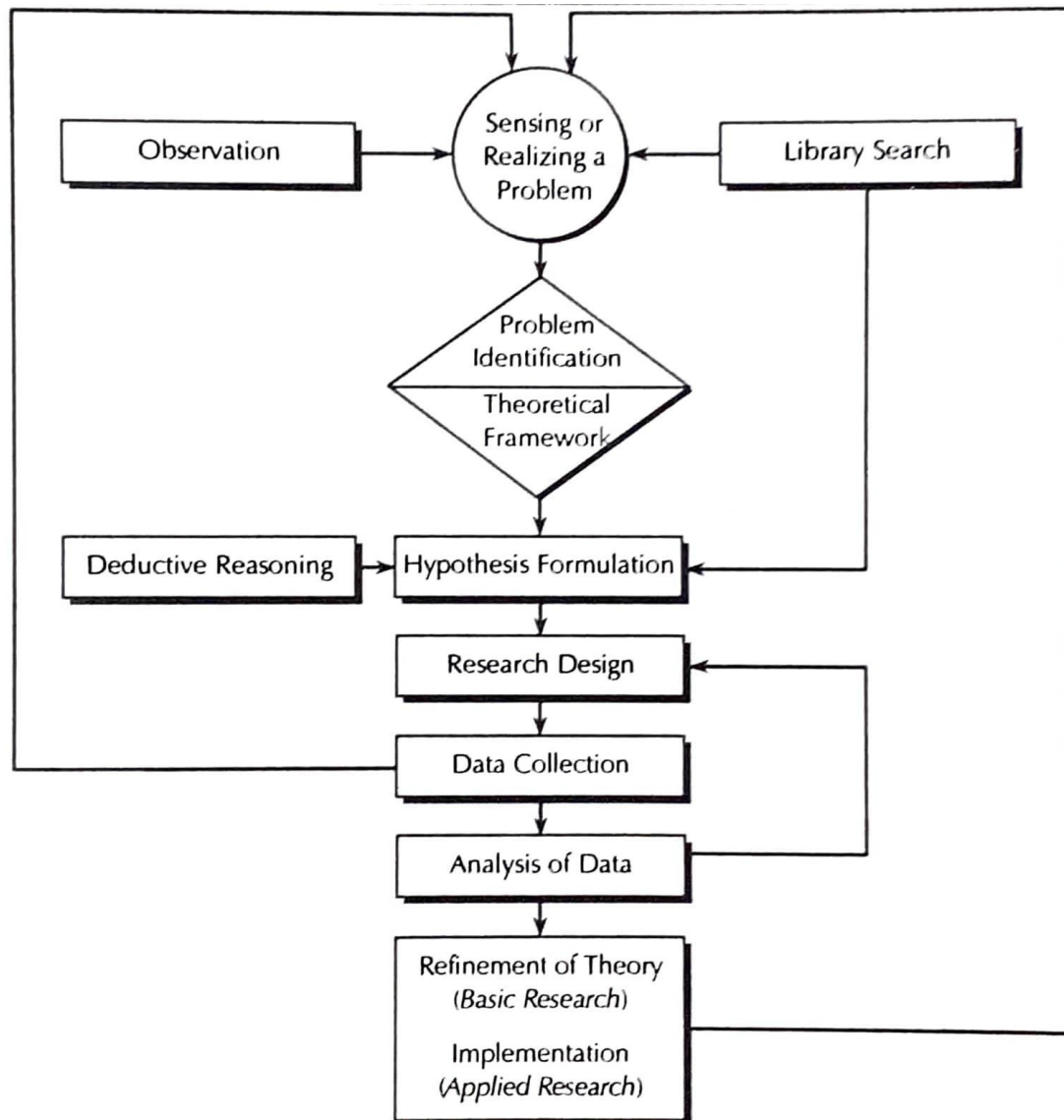
Fundamental research is also concerned with the development, examination, verification and refinement of research methods, procedures, techniques and tools that form the body of research methodology. Thus, fundamental research simply aims to advance knowledge and to identify and explain relationships between variables.

***EXAMPLE:** The HRD Managers' Conference recently held in Kathmandu focused on the issue of employee socialization, training and commitment. The participants in that HRD Conference commonly believed that socialization and training should have a great impact on the productivity and organizational commitment of employees. However, through the years; it has been observed that the productivity of workers over forty years of age does not improve from Socialization and training. On the other hand, organizational commitment of employees over 40 years is relatively higher. Why is this so? The participating HRD managers were looking for answers to these phenomena. What factors might be responsible for these phenomena? What type of socialization and training should be given to employees to improve their productivity and organizational commitment?*

To answer the questions raised by the HRD managers, one has to undertake a basic research. Our existing knowledge is not enough to answer these questions. The purpose of the research is thus to simply increase the amount of knowledge on the issue of employee commitment and training, not to actually come up with a practical solution to a problem. The researcher therefore, has to design an investigation and conduct a study observing socialization and training programs in different work settings and recording the effects of such programs on the productivity and commitment of younger and older employees.

Several of such experiments conducted in different work situations would give the research some idea about the relationship between socialization, training, commitment and productivity of employees belonging to different age groups. The main purpose of conducting fundamental research is thus to advance the level of scientific knowledge.

## **Scientific Research Process**



**Scientific research** is systematic and follows the steps of the scientific method. From the inception of a research idea to the final report of results, the research process has several crucial steps. However, these steps do not provide a rigid pattern into which you must force your thinking. Thinking simply cannot be scheduled. An investigator does not tackle one step at a time, complete that process and then move on to the next step. Some steps can go simultaneously. Others need proper sequencing and logical arrangement.

There are eight steps in scientific method. These eight steps cover the total spectrum of a research endeavor, starting from problem formulation through to refinement of theory or practice. However, these steps may vary depending on the subject matter and the researcher, and also are interdependent with considerable back and forth interaction.

### Sensing or Realizing Problem

The first step in any scientific inquiry is to identify an issue you want to study. There are many sources of research idea (observing the situation or sensing the problem). New problems keep on emerging in the environment. At this stage, you may not know exactly what is happening, but you can definitely sense that things are not going on as smoothly as they should be.

### **Problem Identification**

Once you increase your level of awareness of what is happening in the environment, you would then focus on the problem and the associated factors through further search of information. In this step, you try to identify what exactly are the problems or issues in the situation. There is a saying in research that "a problem well defined is a problem half solved".

### **Theoretical Framework**

In the third step of scientific research, you make an attempt to integrate the information logically so that the reason for the problem can be conceptualized. The critical variables are examined and the association among them is identified. Putting all the variables and their association together, a theoretical framework is developed.

### **Hypothesis Formulation**

In the fourth step of scientific research, hypotheses are formulated. Hypotheses are logically conjectured relationship between two or more variables expressed in the form of testable statements. Hypotheses for the study are drawn from the theoretical framework. Research hypotheses are even more focused. They provide the specific answers to questions that the research will examine often in an empirical way. Hypotheses are particularly useful in quantitative research, where there is statistical analysis.

## **Research Design**

The fifth step is devising the plan for the research. Once you have narrowed your research hypothesis, you must next decide on a design or plan of attack for your research. **The research design is thus a strategy for conducting research.** It describes the general framework for analyzing and evaluating data after identifying:

- a) What you want to know, and
- b) What has to be dealt with in order to obtain required information?

The decision of which design to use can totally depend on the nature of the research project.

## **Collection of Data**

Data collection, the sixth step in scientific research, is also known as fieldwork. **At this stage, you have to administer the research instruments (questionnaire, interview schedules, observation schedules, etc.) to gather data.** However, the procedures used to obtain the data vary depending on the research design chosen and the source of the data. It is important to note that this step is the key part of the scientific research process and is crucial to the success of the research project.

## **Data Analysis**

After you have collected data, you must summarize and analyze them. Data analysis is in fact the statistical analysis of data that have been edited, coded and tabulated. It is especially important in cases, where you have collected large amounts of information from many respondents. You can analyze data in several ways, and some types of data are better analyzed with one method than another. In most cases, you will probably calculate some descriptive statistics that provide a "nutshell" description of your data and inferential statistics that assess the reliability of our data. With the use of these different statistical techniques, the hypotheses are tested.

## **Refinement of Theory or Practice**

The final step involves interpretation and generalization of the findings into the larger body of knowledge about the phenomenon. In the case of applied research, specific implementation strategy is proposed to solve the problem identified by the study. Through research existing theories or practices are refined and modified.

By carefully following the major steps outlined above, you can reduce the possibility of making major errors and increases the possibility that meaningful research results will be obtained. Scientific research helps you to state your findings more accurately and with confidence.

Consider the following case as an example, which shows the nature and process of scientific research:

**EXAMPLE** *A dealer of a car producing company was concerned with the complaints received from the car users that the cars it produces have some problems with rattling sound at the dashboard and the rear passenger seat after a few thousand kilometers of driving.*

- *He obtained information from the company workers to identify the various factors influencing the problem.*
- *He then formulated the problem and generated guesses (hypotheses).*
- *He constructed a checklist and obtained requisite information from a representative sample of cars.*
- *He analyzed the data thus collected, interpreted the results in the light of his hypotheses and reached conclusions.*

In this example, the dealer went through a sequence of steps which were in order and thus systematic. Secondly, the dealer did not just jump at the conclusions. He used a step-wise scientific method of inquiry in reaching at conclusions. This research study, thus, met the important characteristics of research: first, it was a systematic process, and secondly it followed a step-wise scientific method of enquiry to reach at the conclusion.

The most characteristic feature of the scientific research process is its cyclical nature. Research usually starts with a problem and ends in a tentative empirical generalization. The generalization at the end of one cycle is the beginning of the next cycle. The cyclical process continues indefinitely, reflecting the process of a scientific discipline and the ongoing accumulation of scientific knowledge. The research process is also self-correcting. Tentative generalizations to research problems are tested logically and empirically. If these generalizations are rejected, new ones are formulated and tested.