Formulating Research Problems

What is a Research Problem

A research problem, in general, refers to some difficulty which a researcher experiences in the context of either a **theoretical** or **practical** situation and wants to obtain a solution for the same. Research problem does exist if the following conditions are met with:

- ✓ There must be an individual or a group which has some difficulty or the problem.
- ✓ There must be some objective(s) to be attained at. If one wants nothing, one cannot have a problem.
- ✓ There must be alternative means (or the courses of action) for obtaining the objective(s) one wishes to attain (In ideation stage of Design Thinking, one synthesizes to attain the best solution
- ✓ There must remain some doubt in the mind of a researcher with regard to the selection of alternatives. This means that research must answer the question concerning the relative efficiency of the possible alternatives.
- ✓ There must be some environment(s) to which the difficulty pertains

What is a Research Problem 2

Thus, a research problem is one which requires a researcher to find out the best solution for the given problem, i.e., to find out by which course of action the objective can be attained optimally in the context of a given environment.

There are several factors which may result in making the problem complicated. For instance, *the environment may change affecting the efficiencies of the courses of action or the values of the outcomes; the number of alternative courses of action may be very large; persons not involved in making the decision may be affected by it and react to it favorably or unfavorably, and similar other factors.*

Selecting the Research Problem

- The research problem undertaken for study must be carefully selected. The task is a difficult one, although it may not appear to be so.
- Help may be taken from a research guide in this connection *(e.g . Write winning grant proposals by Prof Madara Ogot)*
- Nevertheless, every researcher must find out his own salvation for research problems cannot be borrowed.

A problem should not spring from the researcher's mind unless its something the researcher has uniquely observed

A research guide can at the most only help a researcher choose a subject. However, the following points may be observed by a researcher in selecting a research problem or a subject for research:

- ❖ Subject which is overdone should not be normally chosen, for it will be a difficult task to throw any new light in such a case.
- ❖ Controversial subject should not become the choice of an average researcher.
- ❖ Too narrow or too vague problems should be avoided.

Selecting the Research Problem

- The subject selected for research **should be familiar and feasible so that the related research material or sources of research are within one's reach**. Even then it is quite difficult to supply definitive ideas concerning how a researcher should obtain ideas for his research.

For this purpose, a researcher should contact an expert or a lecturer in the University who is already engaged in research. He/She may as well read articles published in current literature available on the subject and may think how the techniques and ideas discussed therein might be applied to the solution of other problems. He may discuss with others what he has in mind concerning a problem. In this way he should make all possible efforts in selecting a problem.

- **The importance of the subject, the qualifications and the training of a researcher, the costs involved, the time factor** are few other criteria that must also be considered in selecting a problem. In other words, before the final selection of a problem is done, a researcher must ask himself the following questions:
  - ✓ Whether he is well equipped in terms of his background to carry out the research?
  - ✓ Whether the study falls within the budget she can afford?
  - ✓ Whether the necessary cooperation can be obtained from those who must participate in research as subjects?

If the answers to all these questions are in the affirmative, one may become sure so far as the practicability of the study is concerned

- The selection of a problem must be preceded by a **preliminary study**. This may not be necessary when the problem requires the conduct of a research closely similar to one that has already been done. But when the field of inquiry is relatively new and does not have available a set of well developed techniques, a brief feasibility study must always be undertaken.

Formulating Research Problems

- **Quite often we all hear that a problem clearly stated is a problem half solved.**
- This statement signifies the need for defining a research problem. The problem to be investigated must be defined unambiguously for that will help to discriminate relevant data from the irrelevant ones.

- A proper definition of research problem will enable the researcher to be on the track whereas an ill-defined problem may create hurdles.
- Questions like: What data are to be collected? What characteristics of data are relevant and need to be studied? What relations are to be explored. What techniques are to be used for the purpose? and similar other questions crop up in the mind of the researcher who can well plan his strategy and find answers to all such questions only when the research problem has been well defined.

- Thus, defining a research problem properly is a prerequisite for any study and is a step of the highest importance.

Formulating Research Problems

- The most difficult aspect of research is formulating a
  - ✓Clear,
  - ✓Concise, &
  - ✓Manageable research problem.

- Research problems are questions that indicate gaps in the scope or the certainty of our knowledge.

- They point either to problematic phenomena, observed events that are puzzling in terms of our currently accepted ideas, or to problematic theories, current ideas that are challenged by new hypotheses.

Technique involved in defining a Problem 1..

- How to define a research problem is undoubtedly a herculean task. However, it is a task that must be tackled intelligently to avoid the perplexity encountered in a research operation. The usual approach is that the researcher should himself pose a question (or in case someone else wants the researcher to carry on research, the concerned individual, organization or an authority should pose the question to the researcher) and set-up techniques and procedures for throwing light on the question concerned for formulating or defining the research problem. *But such an approach generally does not produce definitive results because the question phrased in such a fashion is usually in broad general terms and as such may not be in a form suitable for testing*

Technique involved in defining a Problem 2..

- Defining a research problem properly and clearly is a crucial part of a research study and must in no case be accomplished hurriedly. However, in practice this is frequently overlooked which causes a lot of problems later on. Hence, the research problem should be defined in a systematic manner, giving due weightage to all relating points. The technique for the purpose involves the undertaking of the following steps generally one after the other:

a. *statement of the problem in a general way;*
b. *understanding the nature of the problem;*
c. *surveying the available literature*
d. *developing the ideas through discussions; and*
e. *rephrasing the research problem into a working proposition.*

Technique involved in defining a Problem 3..

Statement Of The Problem In A General Way;

- First of all the problem should be stated in a broad general way, keeping in view either some practical concern or some scientific or intellectual interest. For this purpose, the researcher must immerse himself thoroughly in the subject matter concerning which he wishes to pose a problem. In case of social research, it is considered advisable to do some field observation and as such the researcher may undertake some sort of preliminary survey or what is often called *pilot survey*.

- The problem stated in a broad general way may contain various ambiguities which must be resolved by cool thinking and rethinking over the problem. At the same time the feasibility of a particular solution has to be considered and the same should be kept in view while stating the problem.

Technique involved in defining a Problem 4..

Understanding The Nature Of The Problem;

The next step in defining the problem is to understand its origin and nature clearly. The best way of understanding the problem is to discuss it with those who first raised it in order to find out how the problem originally came about and with what objectives in view. If the researcher has stated the problem himself, he should consider once again all those points that induced him to make a general statement concerning the problem. For a better understanding of the nature of the problem involved, he can enter into discussion with those who have a good knowledge of the problem concerned or similar other problems. The researcher should also keep in view the environment within which the problem is to be studied and understood.

Technique involved in defining a Problem 5..

Surveying The Available Literature

All available literature concerning the problem at hand must necessarily be surveyed and examined before a definition of the research problem is given.

This means that the researcher must be well-conversant with relevant theories in the field, reports and records as also all other relevant literature. **She must devote sufficient time in reviewing of research** already undertaken on related problems. This is done to find out what data and other materials, if any, are available for operational purposes. “Knowing what data are available often serves to narrow the problem itself as well as the technique that might be used.”.
This would also help a researcher to know if there are certain gaps in the theories, **or whether the existing theories applicable to the problem under study are inconsistent with each other, or whether the findings of the different studies do not follow a pattern consistent with the theoretical expectations** and so on. All this will enable a researcher to take new strides in the field for furtherance of knowledge i.e., he can move up starting from the existing premise.

Studies on related problems are useful for indicating the type of difficulties that may be encountered in the present study as also the possible analytical shortcomings. At times such studies may also suggest useful and even new lines of approach to the present problem.

Technique involved in defining a Problem 6..

Developing The Ideas Through Discussions

Discussion concerning a problem often produces useful information. Various new ideas can be developed through such an exercise. Hence, a researcher **must discuss his problem with his colleagues and others who have enough experience in the same area or in working on similar problems**. This is quite often known as an ***experience survey***. People with rich experience are in a position to enlighten the researcher on different aspects of his proposed study and their advice and comments are usually invaluable to the researcher. They help him sharpen his focus of attention on specific aspects within the field. Discussions with such persons should not only be confined to the formulation of the specific problem at hand, but should also be concerned with the general approach to the given problem, techniques that might be used, possible solutions, etc.

Technique involved in defining a Problem 7..

rephrasing the research problem into a working proposition.

Finally, the researcher must sit to rephrase the research problem into a working proposition. Once the nature of the problem has been clearly understood, the environment (within which the problem has got to be studied) has been defined, discussions over the problem have taken place and the available literature has been surveyed and examined, rephrasing the problem into analytical or operational terms is not a difficult task. Through rephrasing, the researcher puts the research problem in as specific terms as possible so that it may become operationally viable and may help in the development of working hypotheses.

Defining the Research Problem

- ✓Technical terms and words or phrases, with special meanings used in the statement of the problem, should be clearly defined.
- ✓Basic assumptions or postulates (if any) relating to the research problem should be clearly stated.
- ✓A straight forward statement of the value of the investigation (i.e., the criteria for the selection of the problem) should be provided.
- ✓The suitability of the time-period and the sources of data available must also be considered by the researcher in defining the problem.
- ✓The scope of the investigation or the limits within which the problem is to be studied must be mentioned explicitly in defining a research problem.

An Example

"Why is productivity in Japan so much higher than in India"?

In this form the question has a number of ambiguities such as: What sort of productivity is being referred to? With what industries the same is related? With what period of time the productivity is being talked about? In view of all such ambiguities the given statement or the question is much too general to be analysed. Rethinking and discussions about the problem may result in narrowing down the question to:

"What factors were responsible for the higher labour productivity of Japan's manufacturing industries during the decade 1971 to 1980 relative to India's manufacturing industries?"

This latter version of the problem is definitely an improvement over its earlier version for the various ambiguities have been removed to the extent possible.

Further rethinking and rephrasing might place the problem on a still better operational basis as shown below:

"To what extent did labor productivity in 1971 to 1980 in Japan exceed that of India in respect of 15 selected manufacturing industries? What factors were responsible for the productivity differentials between the two countries by industries?"

An Example… Contd…

With this sort of formulation, the various terms involved such as ‘labor productivity’, ‘productivity differentials’, etc. must be explained clearly.

The researcher must also see that the necessary data are available. In case the data for one or more industries selected are not available for the concerning time-period, then the said industry or industries will have to be substituted by other industry or industries.

The suitability of the time-period must also be examined.

Thus, all relevant factors must be considered by a researcher before finally defining a research problem.

When and How to Formulate Problems

- There has been considerable debate over whether or not it is important to define problems explicitly in advance of research and to show how they are linked to prior work.

- Many natural and social scientists **hold that research problems should be formulated by carefully analyzing as much of the relevant research literature as possible, formally stating the problem and the major hypotheses that the literature suggests, and only then collecting the data.** Their intention is to give research a clear and firm justification and to encourage hypothesis testing. This will ensure that each new study does its utmost to add in an orderly fashion to the sum of knowledge.

- However, there are many other natural and social scientists who are equally convinced that this style of formulating problems (above) tends to stifle questions and prevent discoveries that a more open-ended approach might stimulate. This group argues instead for **letting problems and hypotheses emerge throughout the research process, pushed forth by new empirical observations that encourage the researcher to ask new questions and build new theories**.

When and How to Formulate Problems

- Stating the problem early and in a highly structured form may indeed lock the researcher into a fixed stance with respect to the situation being observed, and it may also block the emergence of new ideas that might be stimulated by new experience. But open-endedness may have costs as well.

How do researchers come up with the idea for a research project?

- **Experience of practical problems in the field**

One of the most common sources of research ideas is the experience of practical problems in the field. Many researchers are directly engaged in social, health or human service program implementation and come up with their ideas based on what they see happening around them. Others are not directly involved in service contexts, but work with people directly involved in these programmes in order to learn what needs to be done or investigated (on-going research programmes).

Example: "Garbage management in Nairobi City" – This programme involves collection and transportation of municipal solid waste from Nairobi city to Korogocho where it is a land-filled. The primary goal of such a programme is to keep Nairobi City clean; but as we strive to achieve this, another problem crops up in which noxious gases and liquid effluent emanating from decomposition of organic waste at Korogocho pose other environmental problem to nearby communities and the ozone layer. Through such experiences, a research problem is identified and ways of solving it sought.

How do researchers come up with the idea for a research project?

- **Review of literature in your specific field**

Another source for research ideas is the literature in your specific field. Many researchers get ideas for research by reviewing the literature and thinking of ways to extend or refine previous research. Many published articles give an account of the problems that have been researched and the remaining gaps which need to be closed (need further research). In many cases, no single study will provide definite/permanent solutions to a research problem. Research is a continuous process and as one idea or theory is developed, it raises another question often through verification means.

How do researchers come up with the idea for a research project?

❑ Requests For Proposals (RFPs)

Another type of literature that acts as a source of good research ideas is the Requests For Proposals (RFPs) which are often published by government agencies and some companies. These RFPs describe "some problem" that the agency would like researchers to address. They are in principle giving the researcher an idea to work on. Typically, the RFP describes the problem that needs addressing, the contexts in which it operates, the approach they would like you to take to investigate/address the problem, and the amount they would be willing to pay for such research. This type of approach is commonly appealing in cases where partnerships are developed or exist between public or private research institutions (e.g universities) and private companies.

How do researchers come up with the idea for a research project?

❑ Own ideas and peer discussions

Many researchers think up their research topic on their own or through peer discussions. Definitely such thoughts/ideas developed into researchable problems are influenced by researcher's background, culture, education and experiences. Often these concepts are developed through workshops, seminars or presentation.

❑ Concept mapping

Concept mapping is a general method that can be used to help any individual or group to describe their ideas about some topic in a pictorial form. It is primarily a group process and so it is especially well-suited for situations where teams or groups of stakeholders have to work together. Besides, it uses a very structured facilitated approach.

Factors that need consideration when formulating a researchable problem

❑Is the study feasible?

Very soon after you get an idea for a study reality begins to kick in and you begin to think about whether the study is feasible at all. There are several major considerations that come into play. Many of these involve making **tradeoffs between rigor and practicality**.

To do a study well from a scientific point of view may force you to do things you wouldn't do normally. You may have to control the implementation of your program more carefully than you otherwise might. Or, you may have to ask program participants lots of questions that you usually wouldn't if you weren't doing research. *If you had unlimited resources and unbridled control over the circumstances, you would always be able to do the best quality research. But those ideal circumstances seldom exist, and researchers are almost always forced to look for the best tradeoffs they can find in order to get the rigor they desire.*

Factors that need consideration when formulating a researchable problem

There are several practical considerations that almost always need to be considered when deciding on the feasibility of a research project.

- ✓First, you have to think about **how long the research will take** to accomplish.
- ✓Second, you have to question whether there are important **ethical constraints** that need consideration.
- ✓Third, can you achieve the **needed cooperation** to take the project to its successful conclusion?
- ✓And fourth, how significant are the **costs** of conducting the research. Failure to consider any of these factors can mean disaster later.

Factors that need consideration when formulating a researchable problem

❑The Literature Review

One of the most important early steps in a research project is the conducting of the literature review.
This is also one of the most humbling experiences you're likely to have. Why? Because you're likely to find out that just about any worthwhile idea you will have has been thought of before, at least to some degree.

A literature review is designed to identify related research, to set the current research project within a conceptual and theoretical context. If looked at that way, you will find that there is almost no topic that is so new or unique that you can't locate relevant and informative related research.

Some tips about conducting the literature review.

- First, **concentrate your efforts on the** scientific **literature**. Try to determine what the most credible research journals are in your topical area and start with those. Put the greatest emphasis on research journals that use a blind review system. In a blind review, authors submit potential articles to a journal editor who solicits several reviewers who agree to give a critical review of the paper.

Factors that need consideration when formulating a researchable problem

The paper is sent to these reviewers with no identification of the author so that there will be no personal bias (either for or against the author). Based on the reviewers' recommendations, the editor can accept the article, reject it, or recommend that the author revise and resubmit it. Articles in journals with blind review processes can be expected to have a fairly high level of credibility.

- Second, **do the review early** in the research process. You are likely to learn a lot in the literature review that will help you in making the tradeoffs you'll need to face. After all, previous researchers also had to face tradeoff decisions.

What should you look for in the literature review?

- ✓ First, you might be able to find a study that is quite similar to the one you are thinking of doing. Since all credible research studies have to review the literature themselves, you can check their literature review to get a quick-start on your own.

- ✓ Second, prior research will help ensure that you include all of the major relevant constructs in your study. You may find that other similar studies routinely look at an outcome that you might not have included. If you did your study without that construct, it would not be judged credible if it ignored a major construct.

Factors that need consideration when formulating a researchable problem

- ✓ Third, the literature review will help you to find and select appropriate measurement instruments. You will readily see what measurement instruments researchers use themselves in contexts similar to yours.

- ✓ Finally, the literature review will help you to anticipate common problems in your research context. You can use the prior experiences of others to avoid common traps and pitfalls.