

# An Article to clear up some Misconceptions about the nature of Research

P. Venkataram

Chairman

Center for Continuing Education(CCE)

Indian Institute of Science

Bangalore 560 012, INDIA

*Chairman@cce.iisc.ernet.in*

## Abstract

Research is a systematic process of collecting and analyzing information to increase our understanding of the phenomenon under study. It is the function of the researcher to contribute to the understanding of the phenomenon and to communicate that understanding to others. This article explains what research is, importance of research, how enjoyable it is to do research, etc.

Research is, however, a skilled activity. Like any skill, it must be practiced. The best way to improve your research method is, therefore, to continually assess your research practice against the objectives and guidelines.

## 1 What is Research?

In every research area or subject, our knowledge is incomplete and problems are waiting to be solved. We address the void in our knowledge and those unresolved problems by asking relevant questions and seeking answers to them. The role of research is to

provide a method for obtaining those answers by inquiringly studying the evidence within the parameters of the scientific method.

The word "research" is used to cover a broad spectrum of meaning the activity, which makes it a decidedly confusing term for students. Unfortunately, many students have been having several misconceptions about the nature of research. From school to college, they have heard the word research used loosely and given multiple, misleading meanings. On one hand, the word connotes the finding of an item of information or the making of notes and the writing of a documented paper. On the other hand, it is used for the act of informing oneself about what one does not know or going through available sources to retrieve a required information.

Researchers are sometimes regarded as esoteric individuals who seclude themselves in laboratories, in scholarly libraries, or within the precincts of an academic environment. The public generally is not aware of their daily activity or of the important contributions their work frequently makes to people's comfort and general welfare. Many people, therefore, regard research as a way of life dissociated from the common activities of the everyday world and reluctant to even know more about research.

To appreciate the difference between people's common understanding of research and the more accurate definition, we can perhaps illustrate the following for better understand of the nature of research.

1. The Importance of Research
2. Long- and Short-term benefits of Research
3. Tips for doing Good Research
4. Planning and Organization of a Thesis.

## **2 The Importance of Research**

The importance of research may vary according to kind, especially whether basic or applied.

## **2.1 Basic Research**

Basic research aims to study an advance knowledge with no application to existing problems in view. The audience for basic research consists almost exclusively of other scholars or researchers interested in learning more about a phenomena. There is substantial basic research is going on in subjects, like Physics, Chemistry, etc., whereas virtually no basic research being done in library science and only a small amount in information science.

## **2.2 Applied Research**

Applied research is designed to help solve particular, existing problems so there is a much larger audience eager to support research that is likely to be profitable or solve problems of immediate concern. Much computer communication research on information transfer with considerable impact is a good example.

Applied research can be very simplistic within a given application or it can become quite complicated. While the principle of applied research is easily grasped, not every organization contains persons who are competent in the process of engaging in applied research. Fortunately, there are a number of professionals who are able to step in and help any entity create a working model for applied research.

Besides this, quite a bit of applied research is survey research or marketing research. This is the art and science of systematically asking questions and observing behavior to obtain information from a population of interest.

# **3 Why Do We Do Research?**

Following are the some of the reasons we undertake research has a profession or a hobby.

## **3.1 It is due to to Job Requirement**

In most positions, some sort of research is required to support normal decision-making or Organizational growth.

The organizations hire some of their employees to conduct either **Operational research** which focus on on-going programs and business operations, or **Strategic research** which concentrates on the issues of a long-term goals and marketing strategies.

Often, this type of research is limited by what data is relatively easily available. We need to take advantage of data already available while encouraging managers to see the value in collecting the right information. We need to gather evidence that answers important questions about effectiveness and efficiency rather than just what is easily counted or has always been counted.

Experimental designs are of considerable importance in the organizational research.

### **3.2 Curious to Know Things**

Curiosity is a crucial part of the human condition. Many professionals, including scientists, want to know more about something that interests them. Do anthropologists use government information? How many well-know children's authors have personal websites? Where did my family come from? Are web-log sites more likely to be created by men or women? What do school boys read?. There is an excitement in the discovery of new information and knowing more about some topic than anyone else. There is joy in sharing newly gathered and previously unavailable information. Finally, publishing or sharing information via publication or public meetings provides visibility and recognition. These and many more like these would lead to individual research.

### **3.3 To Build an Ideal World**

In an ideal world, research methods would be an integral part of thoughtful management of any subject development. Better reporting would result in better developments in the subject which would result in better decisions and a much more effective, visibly so, services to the community.

## **4 Educational and Professional Benefits of a Research Degree**

An awareness of the education and skills that you develop during your research will be invaluable when you finish your research and begin the next stage of your career. Following sections highlights some of the benefits of PhD degree.

### **4.1 Transformative Experience**

The education is an experience of personal transformation, although the nature of the transformation varies considerably and may be intensely personal. Examples that of PhD degrees providing such personal transformations include gaining a qualification, learning and developing new skill, improving employment opportunities, professional development, personal development, the pursuit of a challenge, the pleasure of learning and the advancement of knowledge. Of course, these examples are neither exhaustive nor mutually exclusive.

### **4.2 Specialist Knowledge and Skills**

Traditionally, the specialist knowledge and skill developed during the PhD were seen as a preparation for a career in research or academia. It is difficult to be prescriptive, but examples might include: specialist knowledge of your subject discipline; awareness of the boundaries of knowledge within the subject discipline; ability to describe a research problem and develop an appropriate methodology; the ability to use specialized software or technical equipment.

Nevertheless, the reality nowadays is that many PhD graduates do not continue research or academia, but enter quite different careers where they are highly successful due to the confidence and training they obtained during their research programmes. Therefore, it should be obvious that the completion of doctoral research endows the student with more than just specialist knowledge.

### 4.3 Transferable Skills

The completion of PhD degree demonstrates ability to sustain application to a research project for a substantial period of time and apply a variety of management and communication skills to an original piece of research. This should also indicate ability to successfully manage a project; to identify and resolve problems; to demonstrate initiative and determination; and to communicate to a high standard. Interviews with doctoral graduates indicated that, in their opinion, one of the most important outcomes from the PhD process is the training and development of practical and intellectual skills as much as the original contribution to knowledge from their research.

## 5 Points To Be Noted for Good Research

A number of factors affect the success or failure of research, irrespective of the method that is being used:

- **Need for research**

Topic that you are look for must have a significant need for the research should exist. The results need not have immediate application but the topic should not be trivial. The candidate should be confident that his/her research is important and worthwhile. This will help to retain motivation in periods of routine work on the thesis. The need to understand the nature of some specific phenomenon is the motivation for much research that has no immediate practical relevance, but there should, at the same time, be some need, importance or significance in knowing the results.

- **Research problem definition**

If you don't understand your research problem clearly then it is unlikely that you will arrive at a reasonable solution. This is an obvious remark. However, many research projects do little more than re-express a problem in a form that can then be addressed by subsequent research.

- **Well defined research context is required**

There must be well-defined research context. If not, there is a danger that you will "re-invent the spoon" if you do not have a good grasp of previous work in

the area. Today we are well provided with web-based search engines, advice and encouragement. We need to get much relevant information about the research problem either individually or with someones help. It is critical that you spend some time consulting many sources before starting any research project. Otherwise you will find yourself repeating work that others have done before you. However, many research projects actively seek to replicate the results of previous investigations. This must be an explicit objective of your research and not an unfortunate product of poor planning.

- **Good documentation**

It is important that you spend some time documenting your daily activities when engaged on a research project. For example, it is common to find much relevant papers or URLs or books as references and then lose them by not making a careful note or bookmarks. Given that most research is conducted under time pressure, you only have three to four years for most PhD works and two years for an MS(research), you cannot afford to waste time looking for such lost resources. A good rule of thumb is that it must be possible for someone else to follow your steps from your notes alone.

- **Effective time management**

Research is labour intensive. It takes time to find reference material. It can take days to complete a proof. It can take weeks to complete a simulation (or emulation) program or run a set of experiments. It can take many months to write up a thesis or dissertation. You will run out of time if you do not carefully plan your allocation of time to each of these components. It is also important that you plan for failure. Vital pieces of your research infrastructure can and do fail. For instance, your PC, printing resources, and experimental units, are often stretched to breaking point in the hours before a deadline.

- **Match with your interests and capabilities**

The research topic should match both your interests and capabilities. This will sustain you in times of frustration and offset the possibility of entering areas in which you are less competent.

- **Area for professional development**

Your PhD thesis may often be only the beginning of research on a topic. Candidates can make their thesis a stepping-stone in their careers by selecting a topic that provides development in areas in which they hope to work.

- **Contribution of knowledge**

The definition of this concept is difficult. A Masters research thesis does not have to make a significant contribution to knowledge. Thus it does not have to be entirely original, yet it should be based on a significant problem, research question or hypothesis. For example, you may replicate a study in a new geographical area, or with improved data and/or techniques. Your work should relate to, explain, solve or add proof to the question, problem or hypothesis. The results of your research should increase knowledge of that particular field of enquiry. Knowledge can be increased by the following.

- New or improved evidence
- New or improved methodology
- New or improved analysis
- New or improved concepts of theories

## 6 Planning of the Research Proposal

It is crucial that the research proposal is clear and well-planned if effort is not to be misdirected. A great deal of planning must go into your research project; possibly as much as 50 percent of the total time you spend on your thesis will be taken up by planning. The research proposal is designed to enhance your skills in the following areas:

1. Formulation of a research question.
2. Identification of a "gap" in the research literature.
3. Formulation of a set of hypotheses.
4. Preparation of a literature review pertinent to the hypotheses.
5. Choice of a methodology that is appropriate to an examination of the hypotheses.
6. Choice of techniques that are appropriate to an examination of the hypotheses.
7. Description and justification of the chosen methodology and analysis.



8. Organisation and presentation of material into a logical, clear, convincing statement of the proposed research.

## 7 Organising your Thesis

Organise the research material in a logical way. There is no set structure exists but the following arrangement will fit most studies.

- **Abstract**

Summarises what your research work and how you have done it as well as the main conclusions you have drawn.

- **Chapter 1: Introduction**

Lead the reader for a better understanding of the broad objectives of the research study. Be brief and clear but interesting. Include a brief statement of the problem, question or hypotheses, the methodology used, the importance of the research, the limitations and key assumptions and the contribution to knowledge. Briefly describe the lay-out of your thesis by mentioning what you will do in subsequent chapters.

- **Chapter 2: Significant Prior Research on Similar issue**

Present the theoretical foundations of the study, including a statement of research paradigm. Critically review the literature that has a bearing on your problem and lead logically towards a statement of your research question. This part of the thesis need not be limited to one chapter and you can also separate purely theoretical issues from empirical research relating to the problem area. Move logically in the direction of a statement of your research question.

- **Chapter 3: The Research Problem Definition**

Give a comprehensive account of your research problem. Define the research model, and testable hypotheses or objectives. These hypotheses should be supported by your literature study and a brief rationale for each should be provided. This chapter may not be necessary if a comprehensive account of the research problem has been given at the end of chapter 2.

- **Chapter 4: Research Methods**

In this chapter discuss the research methods and techniques that you will employ. Give special attention (where appropriate) to your sample, measuring instruments and any statistical analysis that you will undertake.

- **Chapter 5: Research Results**

Describe simulation, analytical, experimental results, whichever you have obtained and interpret them in detail. Do not refer to other studies at this stage.

In this chapter, you can also, discuss the outcomes of your study with reference to other relevant research and the underlying theoretical framework.

- **Chapter 6: Conclusions and Discussion**

Summarise your investigation and critically discuss your main findings, including limitations. Make recommendations and suggest areas for further research (if appropriate).

- **References**

A reference describes a document from which you have obtained some of your information or evidence. Citing a reference means acknowledging within your text the document from which you have obtained your information.

**Why reference?**

Referencing is a way of demonstrating that you have done that reading. Each time you use someone else ideas or words it is essential that you acknowledge this in your work. Not acknowledging other people's work is not only intellectually dishonest but also illegal. You should provide references:

- To acknowledge your sources.
- To substantiate your arguments.
- To avoid plagiarism, even when unintentional.
- To enable your reader to follow up your source material.

**When to reference?**

Whenever you use any source of information for:

- Your inspiration.

- Particular facts, theories, findings or ideas in an author’s work.
- Specific data or statistics.
- A direct quotation.
- Paraphrasing an author’s words.

**Where and how to reference?**

There are a variety of accepted conventions for citing bibliographic references. Several of these are set out in the British Standards BS 1629:1989 and BS5605:1990. Please check with your research guide which method he/she wants to use.

Remember, whatever referencing method you use, references should be correct, complete and consistent, with the individual elements clearly differentiated.

• **Appendices**

An appendix is supplementary back matter or other written material added at the end of a Thesis or a book or an article or a document or any other text which is in the printed form. The purpose of appendices is basically to explain the statistical concepts or bibliographical references which are used as sources in the book or document or article. In anatomical terminology, the word appendices refers to process or projections. Here are some examples of an appendix:

- Explanations and helpful information the author has decided not to make part of the text.
- Definitions of words or concepts used in the publication.
- Maps, charts, tables, lists, diagrams, or other explanatory sections.

## 8 Conclusions

This article highlighted the importance and nature of research, and its benefits for personal development. It also given some points to be followed for doing quality research. Finally, it illustrated some tips for the selection of a research problem and organisation of your Thesis.