

# RESEARCH METHODOLOGY

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*Beloved Teachers*



## Foreword

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I have immense pleasure in writing a foreword to the book entitled, '*Research Methodology*' authored by Prof. Chandrakant Kokare and Prof. Shrikant Kokare.

Research pursued in different disciplines of science and technology constitutes an important milestone in the growth and development of a nation. The countries making significant investments in science and technology facilitate the process of industrialization which ultimately leads to the prosperity of the nation.

The process of research commences with the selection of the problem for study, defining its objectives, planning sound experimental base, and executing the same for desired results. This book is written keeping in view different course contents. It provides useful tips to the budding scientists for undertaking basic and applied research. It covers selection and formulation of research problem, research design, statistical tools for research, paper, thesis and project writing skills, computer application in research and patenting of research.

I congratulate the authors for their sincere efforts in bringing out this useful piece of information on research methodology.



**Prof. Chandrakant Kokate,**  
Vice-Chancellor, KLE University,  
Belagavi, Karnataka, India.



## Preface to the Fourth Edition

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Research is a field that is rapidly changing and growing its importance for development of nation. Research gives the solution for problems of industry, working conditions, the problem of distribution, nature of services, allocation of nation's resources, information on the economic and social structure etc.

There is need to require many changes in research institutes that is able to compete with developed countries. Research is one of important parameters for international university ranking. Hence, all emerging countries made significant investments on scientific and technological production and an ever increasing competitiveness of the country's industrial base.

The research process starts with selecting the problem of study, describing its objectives, planning, data collection, tabulation and determining the sample of the respondents. The research process ends after actual investigation, interpretation of data, report writing and formulation of theory.

This '**Research Methodology**' book has been designed as a self sufficient text for researcher, teacher, students and budding scientists. This book is written by considering the syllabus of all faculties such as Pharmaceutical Sciences, Law, Management, Science, Arts, Commerce, Engineering, Health Sciences, Education etc. Research methodology as a subject taught in different disciplines at different levels in undergraduate, postgraduate, M.Phil as well as Ph.D. studies. All disciplines may vary in research topic, content and methodology adopted for research studies but their broad approach for research is same in all academic disciplines. Hence, this book will serve as a useful guide for all young researchers.

This revised edition of book is designed by adding suggestions and comments of reviewers, colleagues and students.

We express our sincere thanks to teachers, faculty members and students for their kind help, motivation and valuable guidance in writing this book. We are grateful to all researchers whose works have helped us in the writing of this book. We express our deep scene of gratitude to our family for their love, support and motivation in academics and research. We are also thankful to team of Nirali Prakashan for their sustained efforts and keen interest in the publication of this book.

We shall feel amply rewarded if the book proves helpful in the development of genuine research studies. Any suggestions or criticisms for further improvement of this book will be gratefully acknowledged and highly appreciated.

December 2016

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## Preface to the First Edition

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Research is a field that is rapidly changing and growing its importance for development of nation. Research gives the solution for problems of industry, working conditions, the problem of distribution, nature of services, allocation of nation's resources, information on the economic and social structure etc.

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We express our sincere thanks to teachers, faculty members and students for their kind help, motivation and valuable guidance in writing this book. We are grateful to all researchers whose works have helped us in the writing of this book. We express our deep scene of gratitude to our family for their love, support and motivation in academics and research. We are also thankful to team of Nirali Prakashan for their sustained efforts and keen interest in the publication of this book.

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5<sup>th</sup> September, 2013

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# RESEARCH : AN INTRODUCTION

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## **1.1 INTRODUCTION**

Research is a logical and systematic search for new and useful information on a particular topic. It is an investigation of finding solutions to scientific and social problems, through systematic analysis. The English word 'Research' is derived from the French word 'recherche' which means to seek again. Research is an art of scientific investigation or it includes any gathering of data, information and facts for the advancement of knowledge. The information might be collected from different sources such as journals, periodicals, books, nature, experience, internet etc. It is careful investigation or enquiry through search for new facts in any branch of knowledge. It can lead to new contributions to the existing knowledge. Research is done with the help of experimental study, collection of data, observation, analysis, comparison etc.

Research methodology is a systematic way to solve a specific problem. The techniques or procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. In research methodology, we not only discuss the research methods but also consider the logic

behind the methods used by researchers and explain why researcher's use a particular technique or method. The study of research methodology provides us, the necessary training in selected methods, materials, scientific tools and training in techniques related to the research problem.

A good research must meet the validity and reliability that are most important in evaluating measurement tool of research. Validity means that correct procedures have been applied to find answers to a question. It refers to how will the data collection and data analysis of the research captures the reality being studied. Reliability refers to the quality of a measurement procedure that provides repeatability and accuracy. It demonstrates that the operation of a study, such as the data collection procedures, practical experiments, analysis studies etc. can be repeated with the same outcome or results.

### **1.2 OBJECTIVE OF RESEARCH**

The main objective of research is to discover answers to questions through the application of scientific procedures. Researcher or scientist do research to get a research degree (Ph.D) along with its benefits like promotion, increment, better employment or opportunities in other countries like USA, Germany, England, Japan etc. or curiosity to find new things or unknown facts of the event. Some students or researchers who undertake research without any aim, can also become good researchers by motivating themselves toward a respectable goal.

Each research study has its own specific purpose. The main objectives of research are as follows:

- To develop new scientific methods, concepts and theories to solve the scientific and non-scientific problems.
- To analyse or study the process or phenomenon to identify the cause and effect relationship.
- To serve the society by solving social problems.
- To overcome or solve the problems occurring in our everyday life.
- To get research degree for better employment or promotion.
- To discover new things and test the existing facts.

### **1.3 IMPORTANCE OF RESEARCH**

Research is very vital to our everyday decision-making in scientific and non-scientific fields. The importance of research and development (R&D) investment has become more evident everyday among the factors directly related to good economic performance. Research provides the basis for nearly all government policies in our economic system. Research gives the solution for problems of large and small scale industries, working conditions, the problem of distribution, nature of services allocation of nation's resources, information on the economic and social structure etc. Research is one of the important parameters for International University Rankings. Hence, all

# Research Methodology



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