

CHAPTER 1

Introduction

1.1 Research

It can be said that anything we think about deeply about its consequences in future can be called as research. In other words, if we increase the knowledge or refine or redefine the existing knowledge on the subject, can be termed as research. Invention of new method, new object, new variety of crop, new medicine for health improvement, new engineering equipment, new method of imparting of knowledge to students, new method of preparing food, new breed of animal etc., can be considered as products of research.

Similarly new laws on the theorems developed in mathematics, physics and chemistry etc., are the outcomes of research investigation.

1.2 Basic Research

The research conducted to know the laws of nature which may not be of immediate applicability and it enhances the existing knowledge in mathematics, physics, chemistry etc., are viewed as basic research. Basic research is like a foundation on which the applied research can be built. It

is so important that it provides breakthrough in the existing knowledge system which have major consequences in the development of society. For example, invention of gene, G.N.A, light and sound and their properties, electronics and communication etc. Basic research is being conducted in Tata Institute of Fundamental Research in Mumbai. Many major universities in India and abroad which are funded by Govt. of India through University Grants Commission (UGC), Council of Scientific and Industrial Research (CSIR) etc., in India. Sometimes basic research is being conducted for enhancement of knowledge with sheer interest and enthusiasm of the scientist.

1.3 Applied Research

If research is conducted for a particular purpose of achieving something or solving major or minor problem facing the society is termed as applied research. For example by applying genetic theory in evolving new high yielding varieties of a crop or crops, new breeds of high milk yielding animals, new poultry breeds, new techniques of controlling diseases in human beings, animals and crops, new modes of fuel saving transport vehicles, new powerful computer systems with high storage facility, new mobile communication system, space technology, new machines in industry are the products of applied research. Applied research takes intensive help of basic research directly or indirectly. CSIR laboratories, ICMR laboratories, ICAR research institutions etc., are some of the organizations in India conducting applied research.

1.4 Basic Research Vs Applied Research

There is no class or adversity between basic research and applied research. In fact one is complementary to other. Basic research is being conducted to enhance the knowledge and which may create major changes in the knowledge world. Further it may benefit mankind in a big way sometimes. Applied research is being conducted to achieve a specific objective for immediate benefit. In doing so it takes major or minor use of basic research.

1.5 Disciplines of Research

Research can be conducted in any area of education which include (i) Sciences (ii) Social sciences (iii) Engineering (iv) Medicine (v) Agriculture, veterinary and food science (vi) Humanities like English and any other language literature, philosophy etc.

1.5.1 Research in Science

When research is conducted in subjects or disciplines like mathematics, Statistics, Physics, Chemistry, Botany, Genetics, etc., is known as research conducted in Science.

1.5.2 Research in Social Sciences

If research is conducted in disciplines like, Sociology, Economics, Psychology, Planning, Education etc., is called research in social sciences.

1.5.3 Research in Engineering

If research is conducted in engineering subjects like (i) Civil engineering (ii) Electrical engineering (iii) Mechanical engineering (iv) Computer science engineering (v) Information technology etc., is known as research in engineering.

1.5.4 Research in Medicine

When research is conducted in disciplines of medicine such as (i) Medicine (ii) Anatomy (iii) Surgery (iv) Pathology (v) Pharmacology (vi) Dermatology (vii) Radiantology (viii) Physiology etc., can be considered as research in medicine.

1.5.5 Research in Agriculture, Veterinary and Food Sciences

If research is conducted in disciplines of agriculture such as (i) Agronomy (ii) Plant breeding (iii) Soil science and agricultural chemistry (iv) Entomology (v) Pathology (vi) Plant physiology (vii) Horticulture etc., can be called as Research in agriculture science.

Similarly research is done in veterinary subjects like (i) Medicine (ii) Anatomy (iii) Surgery (iv) Pathology (v) Parasitology (vi) Pharmacology (vii) Animal science (viii) Dairy science (ix) Poultry science etc., is known as research in veterinary science.

Also if research is conducted in discipline like (i) Food nutrition (ii) Food preparation etc., is termed as research in food science.

1.5.6 Research in Humanities

If research is conducted in language literatures of English, Hindi, Telugu etc., with respect to styles, grammar, subject etc., and also in subjects like philosophy is called research in humanities.

1.6 Types of Research

Research can be classified as (i) Descriptive and (ii) Analytical.

If the research work of any aspect of a problem is presented in a descriptive manner without giving much data and their analysis then it is called descriptive research. The investigations carried out in social sciences and business are termed as 'Ex post facto research'. The opinion studies, preference to purchase of certain commodities, i.e. market research, exit polls in elections etc., are known as descriptive research. The presentation of percentages and averages without analyzing using statistical techniques is considered as descriptive research. If the research presentation is done by applying statistical techniques to data obtained in an investigation then it is known as analytical research.

1.7 Scientific Research

The analytical research is sometimes called scientific research where logical reasoning, interrelationships and their relationship to existing body of knowledge is studied.

1.8 Experimental Research

Experiment is conducted either in laboratory or agricultural experimental field to bring out new information or to test the existing facts. Most of these experiments are conducted under controlled conditions by the experimenter. Most of the experiments conducted for medical research, Industrial research, laboratory research in agriculture, veterinary, home science, engineering, psychology, biological sciences belong to experimental research. The agricultural field experiments though they are not conducted in laboratory still come under the category of experimental research because the treatments, crops, seed, water etc., are predetermined and the designs such as completely randomized, randomized block, Latin square, split plot etc., are prefixed. Also the experiments conducted under glass houses for crops, animal experiments etc., fall under the category of experimental research.

1.9 Survey Research

The investigations carried out through survey is called survey research. The survey research is generally followed in social sciences including psychology and planning. The survey usually is conducted to know the actual facts from the respondents. The surveys are carried out for doing research in economics, sociology, psychology, town planning, education etc.

1.10 Significance of Research

Research is very important for every nation or country for its progress in terms of protection or defence, health, economy, education etc. In other words, for constant development and progress of any country, continued research is essential to take stock of the present situation and to plan for the future growth in every indicator of economy for well being of human society. In view of the above, after attaining independence, our country had undertaken several steps to establish research laboratories in industry, medicine, defence, agriculture, engineering, veterinary etc., for carrying out investigations for finding solutions to the problems faced by our country and bring out solutions suitable to our environment and people in general.

Further, research work is carried out by individuals for getting M.Phil and Ph.D degrees for enhancing their academic qualifications. Also research projects are undertaken by investigators in different universities on specific problems which are funded by different funding agencies such as World Bank, Foreign countries, Govt. of India, U.G.C, ICAR, ICMR, CSIR etc., depending upon the urgency and importance of the problem at that point of time.

It is well known fact that 'Noble prizes' were instituted by a family in Norway for awarding cash prize of worth about 10 lakh dollars for the best research work done in different areas of sciences, medicine, biology, economics etc., for enhancing the existing knowledge and for improving the living standards of human society. Similarly in our country 'Shanti Swaroop Bhatnagar' awards are presented to research scientists in different areas of 'Science and technology'.

Also Jawaharlal Nehru awards are given every year to best thesis submitted by Ph.D. scholars in different disciplines of agriculture. Young scientists awards are being given to young scientists by different scientific societies at annual conferences for the best research work done in the concerned discipline. These steps indicate to promote creative activity in the young minds towards better future for the society and country in general.