

RESEARCH METHODOLOGY

LECTURE-4

Research methodology

Research methodology 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 and why. 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 his methodology for his problem as the same may differ from problem to problem. Research methodology simply refers to the practical “how” of any given piece of research. More specifically, it's about how a researcher systematically designs a study to ensure valid and reliable results that address the research aims and objectives. A research methodology encompasses the way in which you intend to carry out your research. This includes how you plan to tackle things like collection methods, statistical analysis, participant observations, and more.

Applications of Research Methodology

The general process of research methodology is almost common to various domains of knowledge that starts with conceptualization of the problems, followed by statement of objectives and hypothesis, conducting experiments and or surveys, carrying out data analysis and making interpretations thereof, and ultimately communicating the findings. There are however, some differences that have been observed in various domains with respect to the way objectives are stated and hypothesis formulated and tested. The research methodology in Social Sciences, thus, somewhat varies from research methodology in Management Sciences, Engineering and Technology, Physical Sciences, and Medical Sciences. It is, therefore, necessary to understand the basic differences in various domains particularly with respect to the applications of research methodology.

IN HUMANITIES

The humanities can be described as the study of how people, process and document the human experiences. Since humans have been able, we have used philosophy, literature, religion, art, music, history and language to understand and record the world. Research in the domain of humanities examines and augments the cultural wealth of the society.

A hallmark of humanistic study is that research is approached in humanities differently than in the natural and social sciences, where data and hard evidences are required to draw conclusions.

IN MANAGEMENT SCIENCES

Businesses and governments make decisions that will shape the life chances of workers, consumers, and citizens for decades to come. In order to shape these decisions to be rational and implementable these ought to be based on rigorous research and to conduct such research, one should to make sure he knows the constituency that research output is going to serve. At the same time, it is long past time for the field to have a serious conversation where their data comes from, and the ethics of using data

IN SOCIAL SCIENCES

Social science in its broadest sense is the study of society and the manner in which people behave and influence the world around them. It provides vital information for governments and policymakers, local authorities, non-governmental organizations and others. Social science tells us about the world beyond our immediate experience, and can help explain how our own society works – from the causes of unemployment or what helps economic growth, to how and why people vote, or what makes people happy. Economics, political science, geography, sociology, etc are all considered to be part of social science domain

IN ENGINEERING & TECHNOLOGY

The engineering design process is a methodical series of steps that engineers use in creating functional products and processes. The process is highly iterative- parts of the process often need to be repeated many times before another can be entered. One framing of the engineering design process delineates the following stages: research, conceptualization, feasibility assessment, establishing design requirements, preliminary design, detailed design, production planning and tool design, and production.

IN PHYSICAL AND LIFE SCIENCES

Physical science is concerned with the study of natural but inanimate objects. These sciences include astronomy, physics, chemistry, and earth science. Life science, on the other hand, is the scientific study of living organisms, including animals (and humans), plants, and microorganism.

IN OTHER DOMAINS

(e.g. Medical Sciences, Pharmaceutical Sciences etc.): Biomedical research is in general simply known as medical research. It is the basic research, applied research, or translational research. It is conducted to aid and support the development of knowledge in the field of medicine. An important kind of medical research is clinical research, which is distinguished by the involvement of patients. Other kinds of medical research include pre-clinical research, for example on animals, and basic medical research, for example in genetics.