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An Introduction to RESEARCH METHODS

A Handbook for Business & Health Research

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ABOUT THE AUTHOR

Dr. M. Nurul Islam is former Selection Grade Professor of Statistics, Faculty of Science at the University of Dhaka, Bangladesh. Currently Dr. Islam is Pro-Vice Chancellor at the World University of Bangladesh. He joined the University of Dhaka as a Lecturer in 1971 and acted as Chairman of the Department of Statistics during 1985-1987. He held the coveted position of the Vice Chancellor of the Mawlana Bhashani Science and Technology University in Tangail during 2009-2013. He is an elected member of famed International Statistical Institute (ISI) of the Netherlands. Dr. Islam is now holding the position of President of the Bangladesh Statistical Association. He also held the same poison of the Association during 2010–2012. Dr. Islam was an elected member of the Dhaka University Senate for the period 2002-2004. He was also a part-time member of University Grants Commission during 2010-2012. During his 45 years' career as a teacher and researcher, he has written nearly one hundred scientific papers and survey reports related to his discipline, which have been published in both local and international journals. He has supervised a number of M.Sc and PhD works. He provided consultancy services to USAID, DANIDA, UNICEF, CIDA, CARE, SIDA, NETZ, Bangladesh Bureau of Statistics (BBS), Ministry of Health and Family Welfare and Ministry of Textile. He independently conducted a number of field surveys as a Principal Investigator. He extensively toured a number of countries including USA, UK, Canada, Egypt, Indonesia, Singapore, Nepal and India and presented papers there in conferences and seminars. He is author of four textbooks entitled (i) **An Introduction to Statistics and Probability, (ii) An Introduction to Research Methods, (iii) An Introduction to Sampling Methods and (IV) An Introduction to Demographic Techniques** published by Mullick & Brothers. The author has also published his entire research works in a single volume entitled **Demographic Research in Bangladesh: An Update,** with the financial assistance from Social Science Research Council, Ministry of Planning. He has been an Executive Editor of several national and international peer reviewed journals. Dr. Islam is also the recipient of the UGC Award and the Dhaka University Faculty Award for 2007 and 2004 respectively for two of his incomparable textbooks.

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CHAPTER 1

FUNDAMENTALS OF RESEARCH

1.1 Research: Definition and Preliminaries

Research is any original and systematic investigation undertaken to increase knowledge and understanding and to establish facts and principles. It comprises the creation of ideas and generation of new knowledge that lead to new and improved insights and the development of new materials, devices, products and processes. It should have the potentials to produce results that are sufficiently relevant to increase and synthesize existing knowledge or correcting and integrating previous knowledge. Good reflective research produces theories and hypotheses and benefits any intellectual attempt to analyze facts and phenomena.

The word 'research' perhaps originates from the Old French word **recerchier** that meant to '**search again**'. It implicitly assumes that the earlier search was not exhaustive and complete and hence a repeated search is called for. In practice, the term 'research' refers to a scientific process of generating an unexplored horizon of knowledge, aiming at discovering or establishing facts, solving a problem and reaching a decision. Keeping the above points in view, we arrive at the following definition of research:

Definition 1.1: Research is a scientific approach of answering a research question, solving a research problem or generating new knowledge through a systematic and orderly collection, organization, and analysis of data with an ultimate goal of making the findings of research useful in decision-making.

When do we call a research scientific? Any research endeavor is said to be scientific if it

- is based on empirical and measurable evidences subject to specific principles of reasoning;
- consists of systematic observations, measurement and experiment;
- relies on the application of the scientific methods and harnessing of curiosity;
- provides scientific information and theories for the explanation of the nature;
- makes practical applications possible, and
- ensures adequate analysis of data employing appropriate statistical techniques.

The chief characteristic which distinguishes the scientific method from other methods of acquiring knowledge is that scientists seek to let reality speak for itself, supporting a theory when a theory's predictions are confirmed and challenging a theory when its predictions prove false.

Research may also be carried out in historical perspective. Such research is known as **historical research**. Historical research is embodied in the historical method. The historical method comprises the techniques and guidelines by which historians use historical sources and other evidences to research and then to write history. Though items may vary depending on the subject matter and researcher, the following concepts are usually the parts of most formal historical research:

- Identification of date of origin;
- Evidence of localization;
- Recognition of authorship;
- Analysis of data;
- Identification of integrity;
- Attribution of credibility.

The phrase **my research** is also used to describe a person's entire collection of information about a particular subject.

Scientific research has multidimensional functions, characteristics and objectives. Keeping these dimensions in view, we assert that research in any field or discipline:

- attempts to solve a research problem;
- involves gathering new data from primary or first-hand sources or using existing data for a new purpose;

- is based upon observable experiences or empirical evidences;
- demands accurate observation and description;
- employs carefully designed procedures and rigorous analysis;
- attempts to find an objective, unbiased solution to the problem and takes great pains to validate the procedures employed;
- is a deliberate and unhurried activity which is directional but often refines the problem or questions as the research progresses.

Scientific research in any field of inquiry involves three basic operations:

- Data collection;
- Data analysis;
- Report writing.

Data collection refers to observing, measuring and recording data or information. **Data analysis**, on the other hand, refers to arranging and organizing the collected data so that we may be able to find out what their significance is and generalize about them. **Report writing** is the final outcome of the study. Its purpose is to convey information contained in it to the readers or audience.

If you note down, for example. the reading habit of newspapers of a group of residents in a community that would be your data collection. If you then divide these residents, say, into three categories, 'regular', 'occasional' and 'never', you have performed a simple data analysis. Your findings may now be presented in a report form. A reader of your report comes to know what percentage of the community people never read any newspaper and so on.

Here are some examples that demonstrate what research is:

- A farmer is planting two varieties of jute side by side to compare yields;
- A sociologist is examining the social consequence of divorce;
- An economist is looking at the interdependence of inflation and foreign direct investment;
- A physician is experimenting the effects of multiple use of disposable insulin syringes in hospital;
- A business enterprise is examining the effects of advertisement of their products on the volume of sales;
- An economist is doing cost-benefit analysis of reducing the sales tax on essential medicines;
- The Bangladesh Bank is closely observing and monitoring the performance of nationalized and private banks;