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University of Basrah
College of Veterinary Medicine
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Research Methods

RESEARCH METHODOLOGY: TOOLS AND TECHNIQUES

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Basics of scientific research
Research Problem
Definition, identification, sources and selection criteria

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Definitions of Research:

The following are the important definitions of research:

“Research is an endeavor / attempt to discover, develop and verify knowledge. It is an intellectual process that has developed over hundreds of years ever changing in purpose and form and always researching to truth.” J. Francis Rummel

“Research is an honest, exhaustive, intelligent searching for facts and their meanings or implications with reference to a given problem. The product or findings of a given piece of research should be an authentic, verifiable contribution to knowledge in the field studied.” P.M. Cook

“Research may be defined as a method of studying problems whose solutions are to be derived partly or wholly from facts.” W.S. Monroes

“Research is considered to be the more formal, systematic intensive process of carrying on the scientific method of analysis. It involves a more systematic structure of investigation, usually resulting in some sort of formal record of procedures and a report of results or conclusion.” John W. Best

“Research comprises defining and redefining problems ,formulating hypothesis or suggested solutions, collecting ,organizing and evaluating data, making deductions and reaching conclusions and at last careful testing the conclusions to determine whether they fit the formulated hypothesis. Clifford Woody

Research is also considered as the application of scientific method in solving the problems. It is a systematic, formal and intensive process of carrying on the scientific method of analysis.

Purpose of Research:

The purpose of research is to discover answers to questions through the application of scientific procedure. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, some general objectives of research below:

1-To gain familiarity with a phenomenon or to achieve new insights into it. (Studies with this object in view are termed as exploratory or formative research studies).

2-To portray accurately the characteristics of a particular individual, situation or a group.(Studies with this object in view are known as descriptive research studies).

3-To determine the frequency with which something occurs or with which it is associated with something else. (Studies with this object in view are known as diagnostic research studies).

4-To test a hypothesis of a causal relationship between variables. (Such studies are known as hypothesis-testing research studies).

Characteristics of Research:

Following are the characteristics of research;

1-Research is directed toward the solution of a problem.

2-Research requires expertise.

3-Research emphasizes the development of generalizations, principles, or theories that will be helpful in predicting future occurrences.

4-Research is based upon observable experience or empirical evidences.

5-Research demands accurate observation and description.

6-Research involves gathering new data from primary or first-hand sources or using existing data for a new purpose.

7-Research is characterized by carefully designed procedures that apply rigorous analysis.

8-Research involves the quest for answers to un-solved problems.

9-Research strives to be objective and logical, applying every possible test to validate the procedures employed the data collected and the conclusions reached.

10-Research is characterized by patient and unhurried activity.

11-Research is carefully recorded and collected.

12- Research sometimes requires courage.

Types of Research:

There are varieties of ways through which we may classify it into different categories.

(A) On the basis of nature of information:

On the basis of nature of information we can classify the research into two types;

1- Qualitative Research: When information is in the form of qualitative data.

2- Quantitative Research: When information is in the form of quantitative data.

(B) On the basis of utility of content or nature of subject matter of research:

On the basis of these criteria we can categorize the research into two categories.

1- Basic/ Fundamental /pure or Theoretical Research: Its utility is universal.

2- Experimental or Applied Research: Its utility is limited

(C) On the basis of approach of research:

We may classify research into two different categories.

1-Longitudinal Research: Examples of this category are historical, Case study and Genetic research.

2-Cross-Sectional Research: Examples of this category are Experimental and Survey Research.

(D) On the basis of method of research :

On the basis of research method we may classify a research into five different categories.

1- Philosophical Research: It is purely qualitative in nature and we are focusing on the vision of others on the content of research.

2-Historical Research: It is both qualitative as well as quantitative in nature and deals with past events.

3- Survey Research: It deals with present events and is quantitative in nature. It may further be sub-divided into; discretionary, correlational and exploratory type of research.

4-Experimental Research: This is purely quantitative in nature and deals with future events.

5- Case-Study Research: It deals with unusual events. It may be qualitative as well as quantitative in nature depending upon the content.

Criteria of Good Research:

One expects scientific research to satisfy the following criteria:

1-The purpose of the research should be clearly defined and common concepts be used.

2- The research procedure used should be described in sufficient detail to permit another researcher to repeat the researcher for further advancement, keeping the continuity of what has already been attained.

3- The procedural design of the research should be carefully planned to yield results that are as objective as possible.

4-The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.

5- The analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate.

6-The validity and reliability of the data should be checked carefully.

7-Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.

8- Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity.

Research Problem

The problems lie everywhere around us. They even lie at our door step and in our backyards. Human nature is so complicated, that a problem solved for one individual may still exist for another individual.

Selection of problem is not the first step in research but identification of the problem is the first step in research. Selection of problem is governed by reflective thinking. It is wrong to think that identification of a problem means to select a topic of a research or statement of the problem.

Definitions of the Problem:

The obstacles which hinder our path are regarded as problem. Different definitions of the problem are given below;

“Problem is the obstacle in the path of satisfying our needs.” John Geoffery

“Problem is a question which is to be solved.” John. G. Tornsand

“To define a problem means to put a fence around it, to separate it by careful distinctions from like questions found in related situations of need.” Whitney

“A problem is a question proposed for a solution generally speaking a problem exists when there is a no available answer to same question.” J.C. Townsend

“A problem is an interrogative sentence or statement that asks: What relation exists between two or more variables?” F.N. Kerlinger

“To define a problem means to specify it in detail and with precision each question and subordinate question to be answered is to be specified, the limits of the investigation must be determined. Frequently, it is necessary to review previous studies in order to determine just what is to be done. Sometimes it is necessary to formulate the point of view or educational theory on which the investigation is to be based. If certain assumptions are made, they must be explicitly noted.”

Identification of a Research Problem:

The following steps are to be followed in identifying a research problem;

Step 1 Determining the field of research in which a researcher is keen to do the research work.

Step 2 The researcher should develop the mastery on the area or it should be the field of his specialization.

Step 3 He should review the research conducted in area to know the recent trend and studies are being conducted in the area.

Step 4 On the basis of review, he should consider the priority field of the study.

Step 5 He should draw an analogy and insight in identifying a problem or employ his personal experience of the field in locating the problem. He may take help of supervisor or expert of the field.

Step 6 He should pin point specific aspect of the problem which is to be investigated

The Sources of the Problem:

1- The classroom, school, home, community and other agencies of education are obvious sources.

2-Social developments and technological changes are constantly bringing forth new problems and opportunities for research.

3-Record of previous research such specialized sources as the encyclopedias of educational, research abstracts, research bulletins, research reports, journals of researches, dissertations and many similar publications are rich sources of research problems.

4- Text book assignments, special assignments, reports and term papers will suggest additional areas of needed research.

5- Discussions-Classroom discussions, seminars and exchange of ideas with faculty members and fellow scholars and students will suggest many stimulating problems to be solved, close professional relationships, academic discussions and constructive academic climate are especially advantageous opportunities.

6- Questioning attitude: A questioning attitude towards prevailing practices and research oriented academic experience will effectively promote problem awareness.

7- The most practical source of problem is to consult supervisor, experts of the field and most experienced persons of the field. They may suggest most significant problems of the area. He can discuss certain issues of the area to emerge a problem.

Q\Definition Research, Research Problem, Case-Study Research

Q\what are the criteria of Good Research

Q\Classify the research according to method of research

Q\Classify the research according to approach of research

Q\ what are the purpose of research

Q\Give only five Characteristics of Research