

IQRA National University
Department of Electrical Engineering
Subject: Research Methodologies



Assignment

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Question No: 1

- a) Differentiate between Search and Research. (05)
- b) Why it is necessary to know about different methods in Research Methodology? (05)

Question No: 2

- a) Explain the following: (05)
 - i) Epistemology
 - ii) Methodology
- b) Differentiate between Qualitative and Quantitative Methods of research. (05)

Question No: 3

Assume that you are the Mayor of Greenwood, a small town in Illinois, and you've got to make decision based on the information collected from the following research study.

The chief of police wants to experiment with increasing the number of patrol officers (X) to reduce the crime rate (Y).The chief invites all twelve area captains to participate in the experiment; only the 103rdvolunteers participated. In October, patrol officers in the103rd are increased by 15%.Reported crime drops 5%between September and December. The chief now wants to implement the program citywide.

Test your research survey with the following case. (10)

Good Luck

Question No.1 (a)

Differentiate between search and Research?

Answer:

Search: The definition of search is the process of looking for something or someone, In other words finding things which already exists or known.

Research: Research is a careful and detailed study into a specific problem, concern, or issue using the scientific methods or to find the relation between cause and effect and to find new knowledge, new things, new ideas, theories laws etc.

Meaning of Research according to various scholar

- Longman Dictionary of contemporary English. (1997) Research as a serious study of a subject that is intended to discover new facts or test ideas.
- According to The Merriam- (Webster online Dictionary). A studious inquiry or examination, especially; investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or law in the light of new facts or practical application of such new or revised theories or law.
- According to Waltz and Bansell (1981). Research is a systematic, formal, rigorous and precise process employed to gain solutions to problems or to discover and interpret new facts and relationships.

The Main Difference between Search and Research

Search

- Search cannot be published.
- To go or look through
- To look at or examine
- To explore or examine in order to discover: They searched the hills for gold.

Research

- Research can be published.
- Research originates with a question or problem.
- Research requires clear articulation of a goal.
- Research requires a specific plan for proceeding.
- Research usually divides the principal problem into more manageable sub problems.
- Research is guided by the specific research problem, question, or hypothesis.
- Research accepts certain critical assumptions

Conclusion: Search is to look for something and Research is to look into it. Research is normally done by experts however, the Search is made by everybody.

Question No.1 (b)

Why it is necessary to know about different methods in Research Methodology?

Answer:

Research is a plan to answer the research question. A research method is a strategy used to implement that plan. Research methods are different but closely related, because good research ensures the data we obtain will help us the answers of our research question more effectively.

It is necessary for a researcher to design a methodology for the problem chosen. One should note that even if the method considered in two problems are same, the methodology may be different. It is important for the researcher to know not only the research methods necessary for the research under taken but also the methodology. For example, a researcher not only needs to know how to calculate mean, variance and distribution function for a set of data, how to find a solution of a physical system described by mathematical model, how to determine the roots of algebraic equations and how to apply a particular method but also need to know:

- (i) Which is a suitable method for the chosen problem?
- (ii) What is the order of accuracy of the result of a method?
- (iii) What is the efficiency of the method? And so on.

Consideration of these aspects constitute a research methodology Importance.

Question No .2 (a)

Explain the following:

- I. Epistemology**
- II. Methodology?**

Answer:

Epistemology:

The term “epistemology” comes from the Greek words “episteme” and “logos”. “Episteme” can be translated as “knowledge” or “understanding” or “acquaintance”, while “logos” can be translated as “account” or “argument” or “reason”.

Definition

The theory of knowledge, especially with regard to its methods, validity, and scope, and the distinction between justified belief and opinion.

It is essentially about issues having to do with the creation and dissemination of knowledge in particular areas of inquiry.

Explanation

Epistemology asks questions like: "What is knowledge?", "How is knowledge acquired?", "What do people know?", "What are the necessary and sufficient conditions of knowledge?", "What is its structure, and what are its limits?", "What makes justified beliefs acceptable?", "How we are to understand the concept of justification?", "Is justification internal or external to one's own mind?"

The kind of knowledge usually discussed in Epistemology is propositional knowledge, "knowledge-that" as opposed to "knowledge-how" (for example, the knowledge that " $2 + 2 = 4$ ", as opposed to the knowledge of how to go about adding two numbers).

Methodology

Definition

Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge. Typically, it encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques.

Explanation

Methodology does not set out to provide solutions, it is therefore, not the same as a method. Instead, a methodology offers the theoretical underpinning for understanding which method, set of methods, or best practices can be applied to a specific case.

For example, to calculate a specific result.

It has been defined also as follows:

1. "The analysis of the principles of methods, rules, and postulates employed by a discipline";
2. "The systematic study of methods can be, or have been applied within a discipline";
3. "The study or description of methods".

The methodology is the general research strategy that outlines the way in which research is to be undertaken and, among other things, identifies the methods to be used in it. These methods, described in the methodology, define the means or modes of data collection or sometimes, how a specific result is to be calculated.

Question No.2 (b)

Differentiate between Qualitative and Quantitative Methods of research?

Answer:

Difference between Qualitative and Quantitative Research

Qualitative Research	Quantitative Research
Methods include focus groups, in-depth interviews, and reviews of documents for types of themes	Surveys, structured interviews & observations, and reviews of records or documents for numeric information
Primarily inductive process used to formulate theory or hypotheses	Primarily deductive process used to test pre-specified concepts, constructs, and hypotheses that make up a theory
More subjective: describes a problem or condition from the point of view of those experiencing it	More objective: provides observed effects (interpreted by researchers) of a program on a problem or condition
Text-based	Number-based
More in-depth information on a few cases	Less in-depth but more breadth of information across a large number of cases
Unstructured or semi-structured response options	Fixed response options
No statistical tests	Statistical tests are used for analysis
Can be valid and reliable: largely depends on skill and rigor of the researcher	Can be valid and reliable: largely depends on the measurement device or instrument used
Time expenditure lighter on the planning end and heavier during the analysis phase	Time expenditure heavier on the planning phase and lighter on the analysis phase
Less generalizable	More generalizable

Question No: 3

Assume that you are the Mayor of Greenwood, a small town in Illinois, and you've got to make decision based on the information collected from the following research study.

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Test your research survey with the following case

Answer

Unemployment has adverse effects on society. Opportunities to youth play vital role in the development of nation on regional and national level. Now, if we cannot get opportunities to earn money and fulfil the basic needs, so such unemployment youth or citizen used shortcuts by doing robbery, which means increasing crime rates (Y).

Now as the Chief police want to increase patrol officers (X) so the good achievement will be to decrease unemployment in a society. Thus automatically crime rates (Y) will be decreased.

As 103 volunteers was assigned a jobs of Patrol officers (X), so they will offer their services to Cities /towns and will be on duties on different spots where crimes usually occurs and reported. It means crime rates (Y) will decrease.

The number of patrol officers (X) in the month of October was increased by 15% so 18 Patrol officers (X) will get a job and more possibility that crime rate (Y) will reduced.

Suppose crimes reported in four month from September, to decrease were 1000 so decreased by 5% means 50 crimes were reduced just in four months. In such a great achievement that has a positive impact on society.

Now if the program is executed to city wise, so more optimistic results will be achieved by decreasing crime rates (Y). Such programs assist in the development of the territories on national and international forums. In Netherlands most of the prisons (jails) are closed due to no crime reported due to their effective police system, education system and public awareness on crimes and its penalties.