

IQRA NATIONAL UNIVERSITY

Department of Electrical Engineering



ASSIGNMENT

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Question No: 1

a) Differentiate between Search and Research. (05)

ANSWER:

Differences between Research and Search

• **Definition**

- Research is a process of analyzing data and information in order to establish facts and get the required conclusions. The methods involve tools, strategies, techniques that the researcher uses in the conduction of the whole research process.
- A search is a process of looking for anything; this could be a person, a set of words, a meaning to something, documents, anything. Searches can be used to find basic solutions or missing items,

• **Expertise**

- In conducting a research, the researcher should have a specific set of skills and great expertise in order to conduct it successfully. Certain aspects of the research process such as the results analysis require additional training.
- Search does not require any specific set of skills or expertise; anyone can conduct a search.

• **Goal**

- The main goal of research is to uncover new information, update current knowledge or to determine facts from lies.
- However, the goal of a search is to simply find something, such as a lost item or the meaning of something etc.

• **Duration**

- Research takes up a longer time than search. Research could last for even months or years.
- Searches do not take time and can last even up to a few seconds.

• **Process**

- The research process involves the use of specific tools and strategies and is more regulated when compared to a search process. The process is more stringent in researches; it may also involve stages and steps as mentioned above.

- A search process is simple, requires less tools and strategies. Searches do not necessarily require any steps or stages to be followed.

- **Regulation**

- Researches can be monitored and regulated. For example, in education institutions, students have a supervisor assigned to them to monitor the whole process. Some research processes may also require legal authorization.
- Searches are not monitored and may not require legal authorization.

- **Inter-dependence**

- Research can at times be dependent on basic search results. In the preliminary research stages, the researcher has to conduct a couple of searches.
- However, searches on the other hand are not dependent on researches done.

b) Why it is necessary to know about different methods in Research Methodology? (05)

ANSWER: It is necessary to know about different methods in Research Methodology as follow:

1) As a graduate student:

- To be able to read and understand the empirical literature in your field; to become a critical consumer of information

2) As a graduate student preparing for a thesis or dissertation:

- To be able to both design and implement your thesis or dissertation as well as future studies that interest you.

3) As a future practitioner:

- To be able to intelligently participate in research projects, evaluations, and studies undertaken by your institution

4) As an educated citizen:

- To understand the difference between scientifically acquired knowledge and other kinds of information

Question No: 2

a) Explain the following: (05)

i) Epistemology

ANSWER:**Epistemology:**

- Epistemology is the theory of knowledge. It is the theory that decided what could be observed. It raises questions like:
 - a) *What is truth?*
 - b) *Do we really know what we think we know?*
 - c) *How can knowledge be made more reliable?*
- It involves an awareness of certain aspects of reality, and it seeks to discover what is known and how it is known.
- Considered as a branch of philosophy,
- Epistemology addresses cognitive sciences, cultural studies and the history of science.
- Moreover, epistemology explains why our minds relate to reality and how these relationships are either valid or invalid.
- It is needed in order to distinguish between the truth and falsehood as we obtain knowledge from the world around us.
- Divided into the following four categories:
 - a) **Intuitive knowledge** is based on intuition, faith, beliefs etc. Human feelings plays greater role in intuitive knowledge compared to reliance on facts.
 - b) **Authoritarian knowledge** relies on information that has been obtained from books, research papers, experts, supreme powers etc.
 - c) **Logical knowledge** is a creation of new knowledge through the application of logical reasoning.
 - d) **Empirical knowledge** relies on objective facts that have been established and can be demonstrated.

ii) Methodology

ANSWER:**Methodology:**

- Methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic.
- In a research paper, the methodology section allows the reader to critically evaluate a study's overall validity and reliability.
- The methodology section answers two main questions:
 - a) How was the data collected or generated?
 - b) How was it analyzed?
- Typically, it encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques

b) Differentiate between Qualitative and Quantitative Methods of research. (05)

ANSWER:

Differences between Qualitative and Quantitative Research Methods

| Qualitative Research | Quantitative Research |
|---|---|
| Qualitative Research is primarily exploratory research. It is used to gain an understanding of underlying reasons, opinions, and motivations. | Quantitative Research is used to quantify the problem by way of generating numerical data or data that can be transformed into usable statistics. |
| It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research. | It is used to quantify attitudes, opinions, behaviors, and other defined variables – and generalize results from a larger sample population |
| 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.

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 103rd volunteers participated. In October, patrol officers in the 103rd 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)

ANSWER:

- As patrol officers in the 103rd are increased by 15%. Reported crime drops 5% between September and December. Therefore, it is clear from the experiment that increasing numbers of patrol officers can reduce crime.
- Critically, the finding was not that adding patrol officers leads to more arrests and then locking up crooks leads to lower crime in the long run. It is simply that with more officers around, fewer people commit crimes in the first place. That seems to be the criminal justice ideal, in which fewer people are being locked up because criminals are victimizing fewer people.
- As the crime drops 5% between September and December, its winter season. So people are at home due to snow and winter holidays that's why in September and December have caused the crime rate to decline
- That's why Crime can be seasonal, peaking in the summer and declining in the winter
- The captain may have implemented other programs that account for the decline in crime of the 103rd volunteered of the program
- It can be possible that old patrol officers in the 103rd take bribe from criminals that's why crime rate was increased and after knowing that they were involved in a priority program, it can be possible that the recorded reported crime differently and show that crime rate is reduce
- It is also possible that increasing 15% patrol officer in the 103rd, criminals have moved to other city. As a result, crime rate is reduced but can have been increase in other cities.
- By increasing 15% patrol officers, the monthly funding of patrol office would be increased and you have to think, you can pay them or not. Instead of this, we can install cameras to monitor street crimes. Simply, it cost one time instead of paying to each patrol officer on monthly basis.
- It can be possible due to increase of patrol officer; criminals go underground for some time.

Conclusion:

- As a Mayor, I can't allow chief to implement the program citywide because It matches with prediction survey.