RESEARCH METHODOLOGY

An Introduction

OBJECTIVES OF THIS CLASS

Definition and the goal of research
Methods of knowing
Scientific method
The responsible researcher
Consolidation of research findings
Types of research
Framing a research question
Elements of research methodology

Research is **defined** as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings.

WHY DO WE DO RESEARCH?

TO CREATE KNOWLEDGE

Why?

The importance and responsibility of our task as a researcher.

WHAT IS KNOWLEDGE?

Knowledge is a familiarity, awareness, or understanding of someone or something, such as facts, skills or objects. (facts believed to be true)

HOW DO WE ACQUIRE KNOWLEDGE ?

DO WE ACQUIRE ALL KNOWLEDGE THRUOGH RESAERCH?

YES /NO

KNOWLEDGE

- *AUTHORITY*
- *INTUITION*
- *RATIONALISM*
- *EMPIRICISM*
- *SCIENTIFIC METHOD*

KNOWLEDGE

- Authority - like teachers, parents, government etc.
- Intuition - truth for oneself, what one feels, mostly guided by emotions and gut
- Rationalism - uses logic and reasoning, based on premises which may or may not be true.
- Empiricism - Through one”s own observation and experience, sensory experience
- Scientific method - systematically collecting and evaluating

  evidence to test ideas and answer questions.

PSYCHOLOGY AS A SCIENCE

CREATION OF KNOWLEDGE IN SCIENCE

- Through systematic empiricism - systematic observation and analysis
- Through empirical questions. Eg. Do criminal behaviour have connection with genetics?
- Ie. SCIENTIFIC METHOD
- Science describes, explains and predicts

WHAT WE DO WITH THE KNOWLEDGE CREATED?

Researchers create public knowledge through publication of research papers which is consolidated in books and articles. This helps to improve our life and finds solutions for our problems. It becomes established facts.

Let us recollect __ The significance of research and a researcher

FRAMING A RESEARCH QUESTION

A FEW TERMS

VARIABLES

a) **Independent**
b) **dependent**

CONTROL GROUP(Comparison group)

EXPERIMENTAL GROUP(treatment group)

The independent variable is the variable that is controlled and manipulated by the experimenter.

The dependent variable is the variable that is measured by the experimenter.

The control group is composed of participants who do not receive the experimental treatment.

An experimental group, receives the treatment whose effect researchers wish to study

TYPES OF RESEARCH

BASIC VS. APPLIED

QUANTITATIVE Vs. QUALITATIVE

QUANTITATIVE - Correlational, experimental and quasi-experimental

QUALITATIVE - Descriptive (Observation, case study)

CORRELATIONAL design which measures a relationship between two or more variables without the researcher controlling them. It aims to find out whether there is a positive or negative correlation. It does not imply causation.

EXPERIMENTAL - involves manipulating one variable to determine whether changes in one variable cause changes in another variable. It relies on controlled methods, random assignment and the manipulation of variables to test a hypothesis.

QUASI-EXPERIMENTAL - without the random assignment of participants to conditions or orders of conditions

TYPES OF RESEARCH QUESTIONS

OPEN ENDED QUESTIONS

Descriptive

Exploratory

CLOSE ENDED QUESTIONS

Relational (Correlational)

Causal (includes Experimental)

FEASIBILITY OF THE RESEARCH QUESTION

POINTS TO CONSIDER

- RELEVANT
- POPULATION AND SAMPLE (Ethical issues, existing rules and regulations, availability, payment etc.)
- INCLUSION OF INTERVENTION -Its feasibility)
- EQUIPMENT
- AVAILABILITY OF VALID TOOLS
- TIME
- COST

Let us recollect Framing a Research question

RESEARCH METHODOLOGY

DEFINITION

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic.

ELEMENTS OF RESEARCH METHODOLOGY

1) RESEARCH QUESTION
2) HYPOTHESIS
3) RESEARCH DESIGN
4) POPULATION & SAMPLE
5) TOOLS
6) PROCEDURES
7) ANALYSIS OF DATA
8) LIMITATION & DELIMITATION
9)Conclusion, Recommendations

HYPOTHESIS

a supposition or proposed explanation made on the basis of limited evidence as a starting point for further investigation.

1) NULL HYPOTHESIS
2) ALTERNATIVE HYPOTHESIS (Directional, Non-directional)

RESEARCH DESIGN

RESEARCH DESIGN

1) QUANTITATIVE (Correlational, Experimental, Quasi-experimental etc.)
2) QUALITATIVE (Case study, Observation etc.)descriptive
3) MIXED

POPULATION & SAMPLE

Population is the collection of individuals or objects known to have similar characteristics

SAMPLING TECHNIQUES

QUANTITATIVE RESEARCH & QUALITATIVE RESEARCH

1) Quantitative - Probability & Non probability sampling, Mostly Probability (Random & Non random)
2) Qualitative - Non probability

In probability sampling every member of the target population has a known chance of being included in the sample.

PROBABILITY SAMPLING TECHNIQUES

1) Simple Random - every member of the population has an equal chance of being selected.

2) Stratified - divide the population into subgroups (called strata) based on the relevant characteristic. Then use random or systematic sampling to select a sample from each subgroup.appropriate when the population has mixed characteristics,

3) Cluster - involves dividing the population into subgroups, randomly select entire subgroups.

4) Systematic - similar to simple random sampling, Every member of the population is listed with a number. Individuals are chosen at regular intervals.

Non probability sampling individuals are selected based on non-random criteria, and not every individual has a chance of being included and so has a higher risk of sampling bias

NON PROBABILITY SAMPLING

1) Convenience - select samples because they are conveniently available to the researcher.,easy to recruit
2) Purposive (judgemental) - choose only those people who they deem fit to participate in the research study,
3) *Quota - a nonprobabilistic version of stratified sampling.population is first segmented into mutually exclusive sub-groups.Then judgment is used to select the subjects or units from each segment based on a specified proportion. it allows the researchers to sample a subgroup that is of great interest to the study.. But only the selected traits of the population were taken into account in forming the subgroups.*
4) Snow ball - helps researchers find a sample when they are difficult to locate, Once the researchers find suitable subjects, he asks them for assistance to seek similar subjects to form a considerably good size sample.

PROBABILITY SAMPLING

- sample selected at random.
- Everyone in the population has an equal chance of getting selected.
- Used to reduce sampling bias
- Gets more accurate sample.

NON PROBABILITY SAMPLING

- selection based on the subjective judgment of the researcher.
- Not everyone has an equal chance to participate
- does not consider sampling bias
- sample does not accurately represent the population.

Let us recollect Sampling

TOOLS
VALIDITY AND RELIABILITY

RELIABILITY & VALIDITY

Reliability is about the consistency of a measure

validity is about the accuracy of a measure.

PROCEDURE

Administration of tools on selected sample, considering ethical issues, considering time schedule etc.

ANALYSIS OF DATA

Analyse the data using suitable statistical procedures.

UNIVARIATE ANALYSIS

BIVARIATE ANALYSIS

MULTIVARIATE ANALYSIS

UNIVARIATE ANALYSIS

Involves one dependent variable and one or more independent variables

1) One independent variable - Linear regression- ANOVA (with more than 2 groups) and t-test (with 2 groups)
2) More than one independent variable - Multiple regression

LINEAR REGRESSION

1) ANOVA - One dependent variable and one independent variable with more than two groups.
2) T-test - One dependent variable and one independent variable with two groups. Compares the mean.

ANOVA (Multiple regression)

TWO WAY ANOVA (one de. Vari. & two inde. va.)

THREE WAY ANOVA (one de. Vari. & three inde. va.)

BIVARIATE ANALYSIS

It is the analysis of the relationship between the two variables.Conducted to determine whether a statistical association exists between two variables.

CORRELATION

Pearson correlation
Spearman rank…
Does not imply causation

BIVARIATE ANALYSIS

MULTIVARIATE ANALYSIS

MULTIVARIATE ANALYSIS

More than one dependent variable and one or more independent variable.

MANOVA can be used.

One way, Two way etc. MANOVA depending upon the number of independent variable.

Let us recollect Analysis of data

DISCUSSION

A discussion on the data analysed.

LIMITATION & DELIMITATION

LIMITATION

The influences the researcher cannot control that places restrictions on methodology and conclusions. Like the extraneous variables etc.

DELIMITATION

Choices made by the researcher. The boundary set by the researcher for the study.

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CONCLUSION & RECOMMENDATIONS