Unit 2 Research Design (concept, elements and types)

Concept

- Once the research problem is formulated, a specific topic is assigned and the hypothesis is formulated, the next stage is to work out a research design. Kerlinger defines a research design as “the plan, structure and strategy of investigation purporting to answer research questions and control variance
- Research design is a strategy of conducting research
- Research design describes the general framework of collecting, analyzing and evaluating data after identifying; a. what you want to know? and b.what has to be dealt with in order to obtain required information?
- Research design is defined as a detailed plan outlining how obserbations will be made. - Sullivan (2001)

- Research design always address certain key issues such as;

1. Who will be studied?
2. How these people will be selected? and
3. What information will be gathered from or about them?

- We have to decide which Research design is undertaken and then to develop methods
- We have to chhose the Research design according to our goals of research

- According to P.V. Young, a research design should be able to provide answer to the following queries:

1. What is the study about and what type of data are required?
2. What is the purpose of the study? What is its scope?
3. What are the sources of the needed data?
4. What should be the place or area of study?
5. What time, approximately, is required for the study?
6. What should be the amount of material or number of cases for the study?

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7. What type of sampling should be used?
8. What method of data collection would be appropriate?
9. How will the data be analyzed?
10. What should be the approximate expenditure?
11. What would be the methodology of study?
12. What should be the specific nature of study?

- “Research design is the plan, structure and the strategy of investigation conceived so as to obtain answers to research question. The plan is the overall scheme or program of the research. It includes an outline of what the investigator will do from writing the hypothesis and their operational implication to the final analysis of data” F. N. Kerlinger(1986)
- “Research design is a master plan specifying the method and procedures for collecting and analyzing the needed information” - William Zikmund(2013)
- Research design is a as “the planned sequence of the entire process involved in conducting a research study” -Miller
- “Research design is the logical and systematic planning and directing of a piece of research.”- P.V. Young,
- Research design is as “a catalogue of the various phases and facts relating to the formulation of a research effort. It is an arrangement of the essential conditions for collection and analysis of data in a form that aims to combine relevance to research purpose with economy with a procedure.” - Selltiz and others

Essentials of good Research design

1. Overall plan for the activities
2. Serves as the framework for the study
3. Guide the researches/researcher
4. A blue print of specifying the method
5. A strategic
6. Objectivity
7. Reliability
8. Validity
9. Generalizability

Elements of Research design

The essential elements of the research design are:

- Accurate purpose statement
- Techniques to be implemented for collecting and analyzing research
- The method applied for analyzing collected details
- Type of research methodology
- Probable objections for research
- Settings for the research study
- Timeline
- Measurement of analysis

Elements of Research Design:

1. Selection of Research Problem:

- As regards the selection of topic for research, anything that is social and empirical is a relevant problem for social research.
- The factors which affect the decisions on selection of topic in social sciences are :

A. The structure and state of a discipline

B. Social problem

c. Other determinants like the availability of grants for particular themes, the popularity and prestige of the particular area ‘of research, public interest and motivation of the researcher etc.,

D. Practical considerations.

2. Selection of Units of Analysis

- Determination of the units of analysis is a key factor in social research. In general, the purpose of the study dictates the selection of the appropriate unit of analysis
- The objects or events or entities under investigation are referred to as units of analysis in social sciences

3. Choice of Variable:

- Since a social scientist is primarily interested in studying the relationship among some characteristics or properties of the observed units, it is necessary for a researcher to decide which variables should be the focus of research
- Explanatory variables are known as the variables under focus. They are of two types dependent and independent. Dependent variable is the presumed effect. The independent variable is the presumed cause
- The extraneous variables are of two types: controlled and uncontrolled. The controlled variables are held constant or prevented from varying during the course of observation. Apart from the above classification of the variables, quantitative variable implies values or categories consisting of numbers, qualitative variables represent certain qualities, attributes or discrete categories

4. Identification of Relationship:

- In real terms, very many social researchers directly aim at developing and testing relationships, apart from gaining familiarity of a phenomenon or description of communities or groups or exploration of a situation or event. However, on the whole, research findings largely depend on particular anticipated relationships
- Therefore, identification of the anticipated relationship and the guiding theoretical premises assume greater importance

5.The Nature of Causal Relationship

- Causal relationships constitute the heart of scientific understanding. These are very much required for purposes of explanation and prediction. In order to establish causality, the social scientists take help of three types of evidence: association, direction and non-spuriousness
- Statistical association, such as a pattern of change in one variable is related to the other variable, indicates that former is the cause. Causal relationships are determined in terms of strong and weak associations..

6. Operationalization of Concepts:

- Since concepts serve a number of important functions, clarity and precision in the usage of concepts are to be achieved by definitions which must contain the distinctive characteristics or qualities of the phenomenon under investigation
- Concepts, in order to be operationally existent, should be established through operational definitions which are instrumental in specifying the contextual meaning of concepts and providing the framework of their application. Briefly stated, the operational definitions serve as a link between the conceptual theoretical level and the observational empirical level.

7. Formulation of Hypothesis

- In order to state the research questions in a precise manner so as to give clear indication of what is to be observed and what kind of information will be gathered, the research questions must be stated in the form of hypotheses.
- Hypotheses are tentative generalizations which are expected but based on unconfirmed relationship between two or more variables.

Types of Research design

1. Historical Research design
2. Descriptive Research design
3. Development Research design
4. Case study Research design
5. Co-relational Research design
6. Causal-comparative Research design
7. Action Research design

1. Historical research design

- History is a meaningful and an organized record of past events. History is the historical reconstruction of pasts
- The purpose of a historical research design is to collect, verify, and synthesize evidence from the past to establish facts that defend or refute a hypothesis
- Historical research involves the careful study and analysis of data about past events
- It relies on available data which are in form of diaries, letters, newspaper, reports and so on
- It covers categories such as historical legal, documentary, bibliographical, biographical, institutional, ideational and organizational events

- Steps of historical research are data collection(Primary sources or first hand information : Remains or relics, Fossils, skeletons, tools, weapons, utensils, clothing, furniture, pictures, painting, coins and art objects), evaluation of the data, and presentation of the facts
- After evaluating the authenticity and accuracy of historical data, the researcher must bring the material together to analyse it and to test the research hypotheses
- The organization of historical material can also be done in topical, thematic or functional arrangement
- Methods and tools used in Historical research design are contemporaneous corroboration, photography, historical revisionism, change log(log or record of changes made to a project such as website or software project)
- Normally, data collection tools are oral history, case study, historical facts

2. Descriptive research design

- Descriptive research design describes events and then organizes, tabulates, depicts and describes the data collection
- Descriptive research design is generally conducted to asses the opinion, behaviours, or characteristics of a given population and to describe the situation and events occuring at present
- In a descriptive design, a researcher is solely interested in describing the situation or case under their research study
- It is a theory-based design method which is created by gathering, analyzing, and presenting collected data
- This allows a researcher to provide insights into the why and how of research. Descriptive design helps others better understand the need for the research

- The purpose of descriptive type of design is to describe some event, situation, people, group or community or some phenomena
- Usually a descriptive design involves detailed numerical descriptions, such as distribution of the population of a community by age, sex, caste or education
- The researcher may also take recourse to descriptive design for estimating the proportion of people in a particular geographical locality in respect of their specific views or attitudes.
- The procedures followed in descriptive design are broadly analogous, notwithstanding the differences evinced in their field, formulation of hypotheses, objectives, for treatment of the problem and in matters of field expansion

- Descriptive research design is accumulation of infortion which is solely descriptive. It does not neccessary to seek or explain relationships, test hypothesis, make predictions, or get at meaning and implications
- Descriptive research design is an extension of an exploratory research. Unlike exploratory research, it is usually formal and rigid. It may be both qualitative and quantitative
- If the problem statement is not clear, you can conduct exploratory research

Exploratory or Formulative Design

- The main purpose of exploratory study is to gather information which will help in future for formulation of a precise research problem
- On the basis of the collected facts, the researcher may be able to formulate sound hypotheses for further research
- The aim of an exploratory or formulative study may be clarification of concepts, establishing priorities for future research and collection of data about the actual conditions which affect an intended research.
- Requirement of Exploratory Design:

(a) Review of pertinent literature

(b) Experience Survey

(c) Analysis of Insight Stimulating cases.

3. Development Research design

- Development Research is carried out for the purpose of predicting future trends
- The forms of Development Research design are as;

1. Longitudinal study: Under such research design, phenomena are studied over time either continuoslyor repeatedly. This study tries to measure nature and rate of change in a sample at differentstages of development. Data are collected from same group of individuals at different points of time. Longitudinal stuy is normally quantitative. It is further divided into;

A. Trend study: When the information are gathered at intervals spread over a period of time, called a trend study. This is designed to establish pattern of change in the past in order to predict future patterns or conditions

- Trend study provides the information about changes, e.g. population of Nepal
- This is designed for combination of information from different or various several studies of the same population toshow the changes

B. Cohort study: Cohort study is a study of specific group who share common characteristics of experiences within a defined period, e.g. birth cohort of 2015

- It is a systematic follow up of group of people for defined period of time or until a specified time
- Data are compiled for the same population over time to form cohort studies

C. Panel study: A panel is a group of individuals that have agreed to provide information to a researcher over a period of time

- In such study, same people are taken and their attitudes towards particular phenomena over time are studied
- It is useful to study change of phenomena. It reveals both type of change, that is net or gross

2. Cross-sectional study

- Cross-sectional study involves observation of same items of the population all at the same time
- It basically measures the rates of changes by drawing samples from a cross-section of society

- This study focuses on comparing and describing the groups of the population
- This type of study usually uses survey strategy
- Cross-sectional study takes place at a single point of time where as longitudinal study takes place a series of measurement over a period of time

Characteristics and steps in developmental research(Isaac 1978)

1. It focuses on the study of variables and their development over a period of time, e.g. patterns, rates, direction, sequence of growth
2. Limited number of subjects that are followed over the years
3. Longitudinal method does not lent itself to improvements in techniques

4. Cross-sectional study usually includes more subjects
5. Sampling is complicated in cross-sectional study
6. Trend studies are vlnerable to unpredictable factors that modify or invalidate trends based on the past

4. Case study Research design

- It is an approach. It needs to be both comprehensive and systematic
- Case study is detailed study of units that may be individuals, groups, organizations, institutions, events, situations etc.
- Typology of case study(Jensen and Rodgers 2001);

A. Snapshot case study: Detailed study of one unit

B. Longitudinal case study: Study of the same unit at multiple time points

C. Pre-post case study: Undertaken at two time points separated by a critical event

D. Cross- case study: Study of multiple case studies for the purpose of comparision

- The features of case study

1. Indepth investigation
2. Tends to examine small number of units
3. Intensive and insight
4. Narrow focus on few units
5. Not generalizable

5. Correlational research design

- In correlational research design two variables are related. This relatioship shows the ifluences of variables
- Correlational research is a non-experimental research design technique that helps researchers establish a relationship between two closely connected variables
- This type of research requires two different groups. There is no assumption while evaluating a relationship between two different variables, and statistical analysis techniques calculate the relationship between them
- A correlation coefficient determines the correlation between two variables, whose value ranges between -1 and +1. If the correlation coefficient is towards +1, it indicates a positive relationship between the variables and -1 means a negative relationship between the two variable

- Relationships may be close, moderate, or unrelated
- The types of co-relation are; a. positive, b. negative and c. no relation
- Co-relations measure over as scale like a. negative(-1.0), b. positive(+1.0) and c. no relation(oo)
- It does not prove casuality, but indicas how strongly two or more variables are related
- The features of co-relational research are;

1. The complexity of relationship
2. Measurement of relationship
3. Degree of relationship

6. Causal comparative research design

- Causal comparative research establishes the causal relationships between variables
- This type of research may be termed as explanatory studies, and also called 'ex post facto(latin- after the fact)
- This type of study focuses on the problems in order to expalin cause-effect relationships of variables
- According to Kerlinger,(2000), ex post facto research is that research in which the independent variable or variables have already occured and in which the researcher starts with the observation of a dependent variable or variables
- This research design focuses on the independent variables in respect for their possible relations to, and effect on the dependent variables

- Causal comparative research involves that there is control or comparison group, ther is an intact group and the treatment has already occured, not manipulated
- There are three type of Causal comparative research;

1. Explorations of effect
2. Exploration of causes
3. Exploration of consequences

- There are other category of variables which have different possibilities of relationships;

1. Symmetrical relationship: two variables fluctuate together
2. Reciprocal: mutually influence or re-enforce each other
3. Assymmetrical: changes in one variable(independent) is responsible for changes in another variable(dependent)

- This is like eperimental research
- Experimental research design establishes a relationship between the cause and effect of a situation
- It is a causal design where one observes the impact caused by the independent variable on the dependent variable
- It is a highly practical research design method as it contributes to solving a problem at hand. The independent variables are manipulated to monitor the change it has on the dependent variable
- It is often used in social sciences to observe human behavior by analyzing two groups
- Discovering the causal relationships is the key to experimental research

7. Action or interventional research design

- Action research involves a continuous gathering and analyzing of rearch data during the usual on-going operations of organization and institution
- It is designed to identify effective ways of dealing with problems. It helps in changing the organization's mode of functioning
- The research strategy of Action research design is to pursue “action and knowledge”
- Action research is task-oriented form of study designed to provide feedbacks to the management for the interventions

- This type of research design involves

1. to address practical problem
2. to generate new knowledge
3. to enact changes
4. to make participatory
5. to relie on cyclical process

- On the other hand, in interventional research studies the researcher intervenes or manipulates a situation to measure the effect of manipulation
- For example,study of job satisfaction, relationships between salary and job satisfaction, relationships between training and job satisfaction
- Usually(but not always), two groups are compared on in which the intervetion takes place