**Unit 1**

**Design of Educational Research**

1.1. Research Design- meaning, purpose, characteristics, elements, types- historical and

experimental.

1.1.1. Historical Research – meaning, scope and steps (defining a research problem and types

of historical enquiry, searching for historical sources, summarizing and evaluating

historical sources and presenting pertinent facts within an interpretive frame work).

Type of historical sources, external and internal criticism of historical sources.

1.1.2.Experimental Design – Principles of experimental design, pre-experimental design, true

experimental design, Quasi experimental design, factorial design. Internal and external

experimental validity- threats to internal and external validity.

1.1.3 Research – Survey, causal comparative, correlational, case study, longitudinal, cross

sectional, Ex-post Facto design.

**Research Design**

Research design refers to the plan and structure of the investigation used to obtain evidence to answer research questions. Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design.

**Miller** defined “*Designed research as the planned sequence of the entire process involved in conducting a research study.”*

According to **Selltiz** and others*, “Research design is a catalogue of the various phases and facts relating to the formulation of a research effort. It is the arrangement of the essential conditions for collection and analysis of data in a form that aims to combine relevance to research purpose with economy in the procedure.”*

Thus, research design is the plan, structure, and strategy of investigation conceived so as to obtain answers to research questions and control variance

**Purpose of Research Design**

1. To provide most valid and accurate answers possible to research questions.
2. To make research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money.
3. It stands for advance planning of the methods adopted for collecting relevant data.
4. The design helps the researcher to organize his ideas in a form, whereby it will be possible for him to look for errors and inadequacies

**Characteristics of Research Design**

A good research design should satisfy the following conditions:

1. **Objectivity**

The objectivity of the findings pertains to the methods of collection of data and scoring of the responses. Thus any research design should permit the use of measuring instruments which are fairly objective in which every observer or judge seeing a performance arrives at precisely the same report. This ensures the objectivity of the collected data.

Ex: Closed ended questionnaires are said to be collecting data with the help of the objective tools because the scores can apply a scoring key and agree perfectly on the result.

1. **Reliability**

Reliability refers to consistency throughout a series of measurements.

1. **Validity**

Any measuring instrument is said to be valid when it measures what it purports to measure.

1. **Generalization**

Generalization means with how much authority and confidence, an investigator can say that the same findings will be obtained even though the data is collected from the total population from which the sample is selected.

**Elements of Research Design**

One may split the overall research design into the following elements:

1. The sampling design - which deals with the method of selecting items to be observed for the given study.
2. The observational design – which relates to the conditions under which the observations are to be made.
3. The statistical design – which concerns with the question of how many items are to be observed and how the information and data gathered are to be analyzed.
4. The operational design – which deals with the techniques by which the procedures specified in the sampling, statistical and observational designs can be carried out.

**Types of Research Design**

The different research designs are:

1. **Research design in case of exploratory research studies (formulative research studies)**

The main purpose of such studies is the discovery of ideas and insights. It includes survey of concerning literature, analysis of insight stimulating examples etc.

1. **Research design in case of descriptive and diagnostic research studies**

Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group, whereas diagnostic research studies determine the frequency with which something occurs or its association with something else.

1. **Research design in case of hypothesis-testing research studies**

Hypothesis testing research studies (generally known as experimental studies) are those where the researcher tests the hypotheses of causal relationships between variables. Such studies require procedures that will not only reduce bias and increase reliability, will permit drawing inferences about causality. Usually experiments meet this requirement through experimental designs.

**Longitudinal Research**

Longitudinal research is a type of correlational research that involves looking at variables over an extended period of time. This type of study can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades. The researchers want to conduct studies that take a very long time to complete because a longitudinal study can be used to discover relationships between [variables](https://www.verywellmind.com/what-is-a-variable-2795789) that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

**Features**

1. Single sample over extended period of time.
2. Enables the same individuals to be compared over time.
3. Micro-level analysis.
4. They are observational in nature
5. They are a type of [correlational research](https://www.verywellmind.com/correlational-research-2795774)
6. Longitudinal research is often contrasted with cross-sectional research

**Types of Longitudinal Study**

There are three major types of longitudinal studies:

1. **Panel study:** [Panel](https://www.questionpro.com/audience/)study is a particular type of longitudinal study in which there is a sample of people from a bigger population and study is conducted at specified intervals for a longer period of time. One of the most important features of panel study is that data is repeatedly collected from the same sample at a different point in time. Most panel studies are designed for [quantitative](https://www.questionpro.com/blog/quantitative-market-research/)analysis, however, they can also be used with ease for [qualitative data](https://www.questionpro.com/blog/qualitative-data/) collection and analysis.
2. **Cohort Study:** Cohort study is a form of longitudinal study that samples a cohort (a group of people who typically experienced a common event at a given point in time). A cohort study is essentially used in the field of medicine. Some might argue and call clinical trials a form of cohort studies, however, in cohort studies, there is a mere observation of the sample or participants involved in the study, unlike clinical trial.
3. **Retrospective study:** Retrospective study makes use of already existing data, that exists because similar kind of research was conducted previously. While conducting a retrospective study, researcher uses an administrative database that already exists, pre-existing medical records or one-to-one interview.

**Advantages of Longitudinal Study**

1. Longitudinal study is used exceptionally because of their ability to identify and relate to events. By conducting this type of study the chronicity of events is identified especially in the field of medicine.
2. Since longitudinal study is carried out over a long period of time, it helps to identify and establish a particular sequence of events.
3. Longitudinal study help provide meaningful insights that might not be possible with other forms of study like cross-sectional and similar studies.
4. Longitudinal study allows researchers to trace development over a longer period of time instead of simply jumping to conclusions.

**Disadvantages of Longitudinal Study**

1. One of the disadvantages of longitudinal studies is that it is not cost-effective. Since this study can run over a period of time, amount of money that needs to be pumped into conducting this study is fairly high.
2. An extended time period may mean dropouts in the number of respondents. People get bored and chances are they won’t participate until the end of research.
3. Its human psychology, people may start to act differently because they know they are being observed. This is a drawback in terms of the data collected. It won’t remain unbiased.
4. Continuity over years may be little difficult. For example, if the lead researcher of the study retires, the person replacing him/her may or may not have the same rapport. So the outcome of the study would be ambiguous.

**Cross Sectional Research**

Cross sectional research is used to examine one variable in different groups that are similar in all other characteristics such as socioeconomic status, educational background, ethnicity etc. It is one which collects data about various variables of the sample at one point of time in order to uncover relationships existing among those variables. There is no experimental procedure in cross sectional research, so no variables are manipulated by the researcher. Instead of performing an experiment you would simply record the information that you observe in the groups you are examining.

Cross sectional research involves looking at different groups of people at different ages. For example, a research might measure or observe a group of young adults and compare this data with information gathered about a group of elderly participants. The benefit of this type of research is that it can be done relatively quickly; the research data is all gathered at same point in time. However because data is gathered from generations of people who share the same cultural experiences, these shared events may play a role in development. This makes it difficult to determine if something is caused by experience on the aging process.

**Characteristics**

1. It gathers data at one time point and creates a kind of ‘snapshot’ of social life.
2. It is exploratory, descriptive or explanatory but it is most consistent with a descriptive approach.
3. It is usually the simplest and least costly alternative but rarely captures social processes or change.

**Example**: A study to examine the relationship between job satisfactory and style of leadership or between similarity of automobile preferences between husbands and wives and the amount of time the couples has been married is cross sectional study.

**Advantages**

1. Many of the practical difficulties of the longitudinal method are not characteristics of cross sectional method. This approach studies subjects of various age levels at the same point in time. For example a cross sectional study of the development of quantitative skills would employ a different sample and of the standard levels. It would compare the statistics derived from the samples and draw conclusions about the growth of children with these skills.
2. Many of the limitations of longitudinal method are overcome in the cross sectional studies. When conducting cross sectional studies rather than following the same group of individuals and taking their repeated measurement over a relatively long period of time, the random sample of successive ages are selected and one set of measurements of different individuals from each age level are taken as the basis for developing growth norms.

**Limitations**

1. The researcher cannot remove all variations due to the variables other than age in which groups differ and differences due to the extraneous variables may seriously affect the results.
2. The measurements taken of individuals at each age level may not be comparable because the groups may differ on other than age,.
3. Another serious limitation is that chance differences between samples may seriously bias the results.

**References**

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3.Neuman,L.(2015)*Social Research Methods-Qualitative and Quantitative Approaches.*Noida:Dorling Kindersley Publications .p 44.