RESEARCH APPROACHES AND DESIGNS

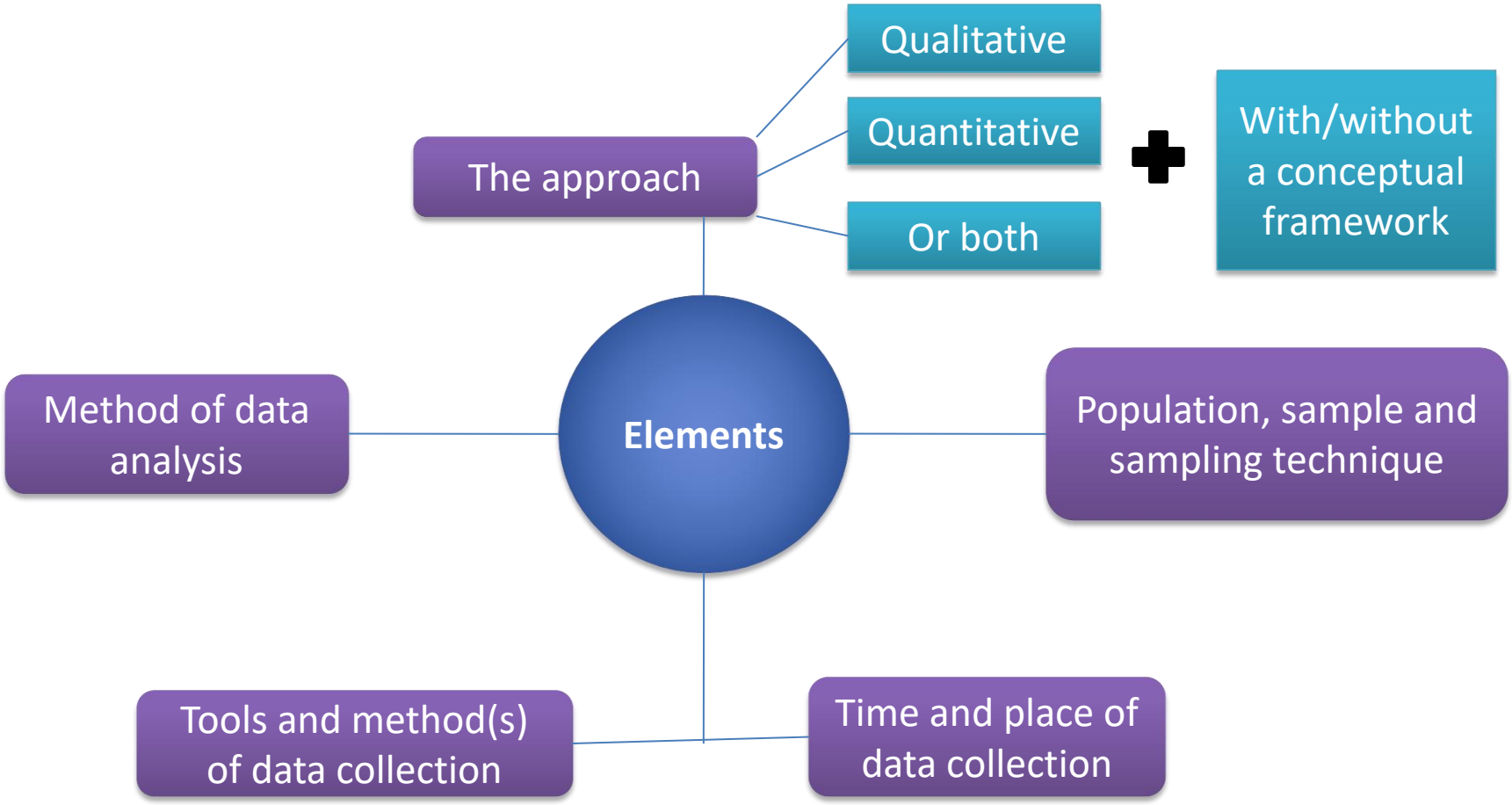
Introduction

- Research design &research approach – used interchangeably
- Research design is the framework or guide
- Research approach is an important element of research design which governs it

Definition

Research design can be defined as a blue print to conduct a research study, which involves the description of research approach, study setting, sampling size, sampling technique, tools and method of data collection and analysis to answer a specific research question or for testing research hypothesis.

Elements Of Research Design



Factors Affecting Selection Of Research Design

- Nature of research problem
- Purpose of the study
- Researchers knowledge and experience
- Researchers interest and motivation
- Research ethics and principles
- Subjects/participants
- Resources
- Time
- Possible control on extraneous variables
- Users of the study findings

Validity Of Research

- Two important criteria for evaluating credibility and dependability of research
- Internal validity (validates whether independent variables actually made a difference)
- External validity (refers to the extent to which the results can be generalized)

Factors affecting Internal validity

- History
- Maturation of subjects
- Testing
- Instrumentation change
- Mortality (loss or dropout of subjects)
- Selection bias

Factors affecting External validity

- Hawthorne effect
- Experimental effect
- Reactive effect of pretest
- Novelty effect
- People (race)
- Place
- Time

Types Of Research Design

- Quantitative research design
- Qualitative research design
- Mixed methodology

Quantitative Research Designs

- Experimental research design
- Non experimental research design
- Other additional research designs

Experimental research design

- Scientifically sophisticated research method
- Defined as observation under controlled conditions
- Concerned with effects of independent variable on the dependent variable
- Independent variable is manipulated through treatment and effect is observed on the dependent variable

Steps In Experimental Design

1. Delineate the population or universe to be studied
2. Select a sample from the population by random sampling
3. By random sampling subdivide the sample into 2 sub – samples
4. Specify one sub-sample, the experimental group and other the control group
5. Before introducing the independent variable, observe and record all important characteristics of both the groups.
6. Introduce the independent variable into the experimental group but with holds it from the control group.
7. After introducing the independent variable, observe the dependent variable in experimental and control group
8. Compare the changes that occur in the experimental group with those that may have occurred in the control group.
9. Record the difference
10. Compare these values with statistically computed values that judge the significance of the difference, and indicate whether or not the observed differences could have occurred by chance

Experimental research designs

- True experimental design
- Post test only control design
- Pre-test – post test control group design
- Solomon four group design
- Factorial design
- Randomized block design
- Crossover design
- Quasi experimental design
- Non randomized control group design
- Time series design
- Pre – experimental design
- One shot case design
- One group pretest – post-test design

True Experimental Design

- Complete control over extraneous variables
- Can confidently predict that the effect on dependent variable is due to manipulation of the independent variable
- Essential characteristics

- Manipulation
- Control
- Randomization

Manipulation

- Example gentle massage and pain levels
- Gentle massage – independent variable
- Pain levels – dependent variable

Control

- Refers to use of control groups
- Similar number & characteristics are needed
- Experimental group receives treatment and control group does not
- Comparison is made

Randomization

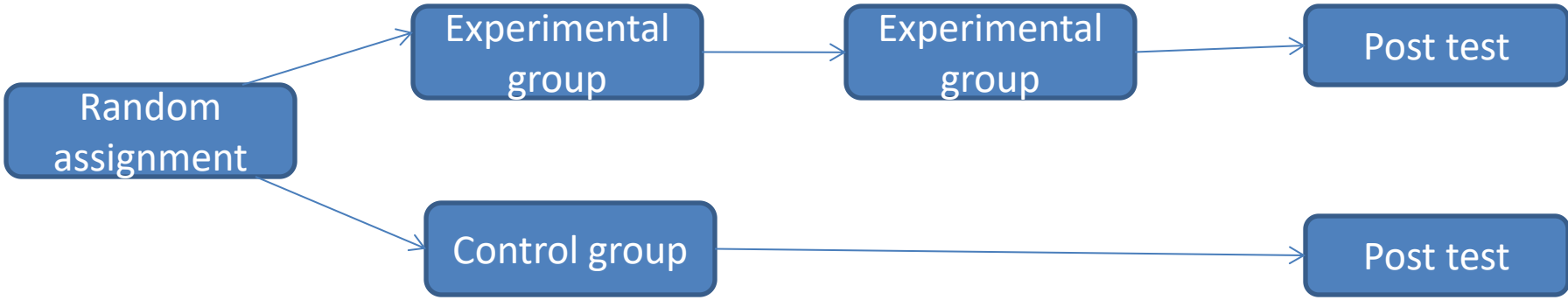
- Means every individual has an equal chance of being assigned to experimental or control group
- Involves random assignment of subjects
- Methods
- Flip of coin
- Lot
- Random table
- Symbolic presentation

R – Random assignment

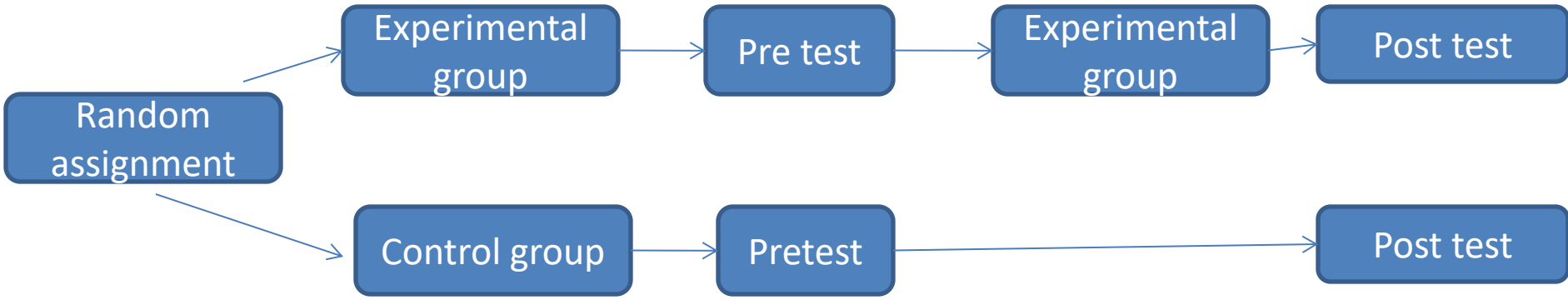
O – observation

X – experimental treatment

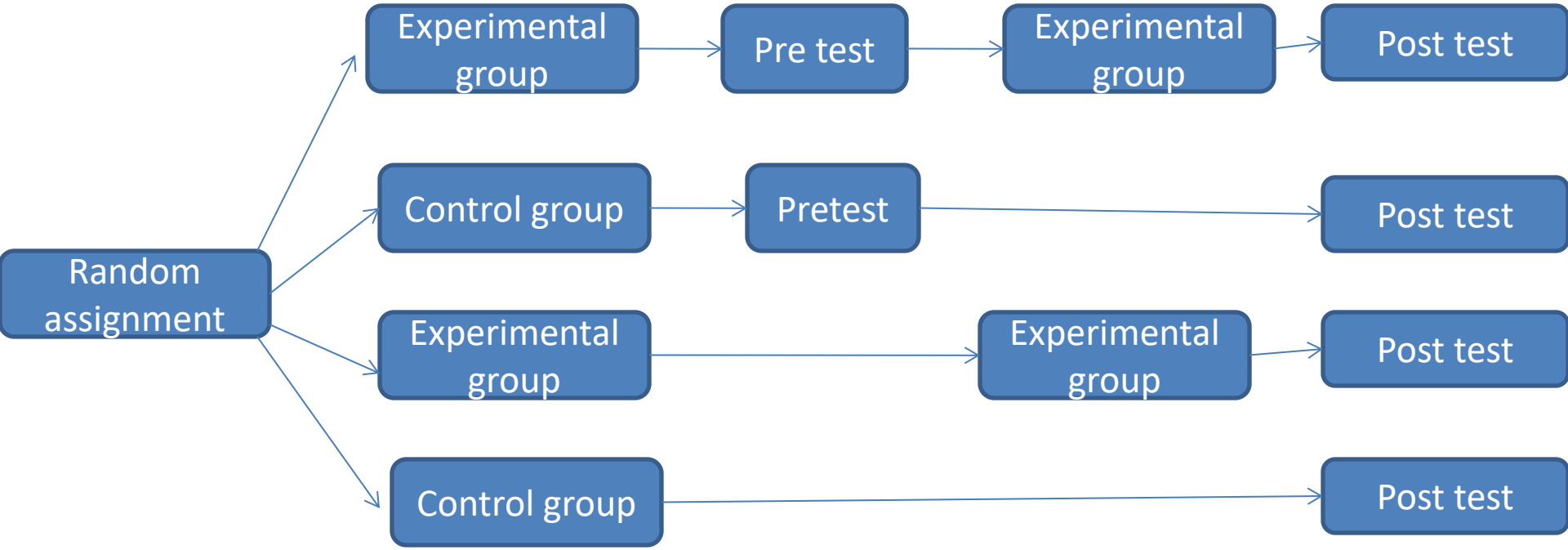
Post Test Only Control Group Design



Pre test Post Test Control Group Design



Solomon Four Group Design



Factorial design

- Researcher manipulates 2 or more factors (independent variables) simultaneously
- Facilitates testing of several hypotheses at single time

Frequency of mouth care	Protocols of the mouth care	
	Chlorhexidine	Saline
4 hourly	4 hourly	4 hourly
6 hourly	6 hourly	6 hourly
8 hourly	8 hourly	8 hourly

Randomized block design

- Formation of categories
- Out of two factors one factor is not manipulated
- For e.g, effect of 3 antihypertensive drugs on 3 different categories of hypertensive clients

Crossover design

- Subjects are exposed to more than one treatment

Groups of clients	Protocols of the mouth care	
	Chlorhexidine	Saline
Group I	Chlorehexidine	Saline
Group II	saline	Chlorehexidin e

Advantages

- Most powerful methods
- Usually shows cause and effect relationship
- Greater degree of purity in observation as it uses control
- Can create conditions

Disadvantages

- Not possible to conduct research on human beings
- Sometimes control may not be possible
- They are impractical

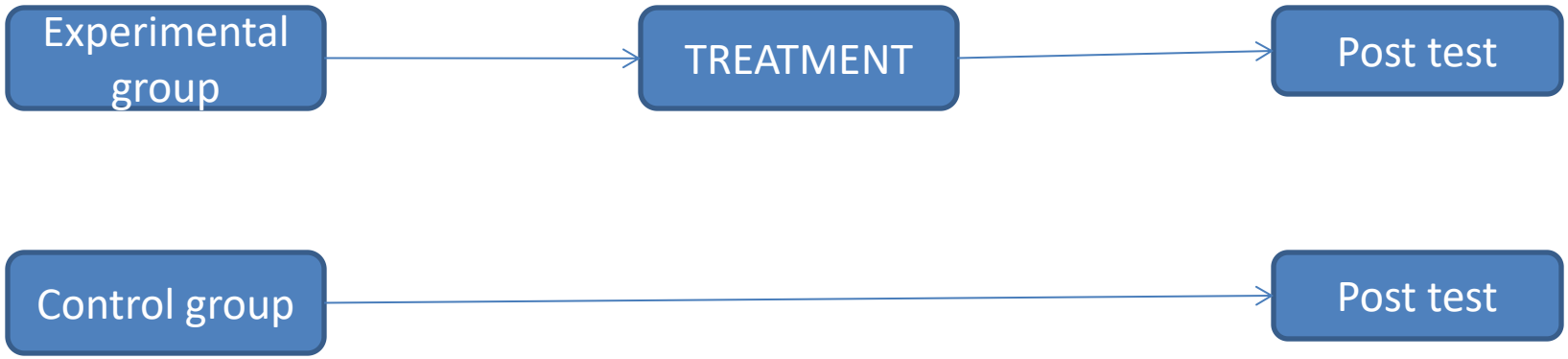
Quasi Experimental Research Design

- Involves manipulation
- May or may not involve either control or randomization

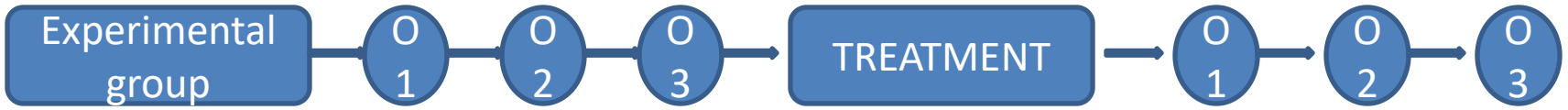
Types Of Quasi Experimental Research Design

- Non randomized control group design
- Time series design

Non Randomized Control Group Design



TIME SERIES



ADVANTAGES

- More frequently used
- Suitable for real world natural settings
- May help in establishing cause and effect relationship

Disadvantages

- No control over extraneous variables
- Absence or lack of control over settings

Pre experimental research design

- Considered very weak as the researcher has very less control

Types

- One shot case design
- One group pretest – post-test design

One - Shot Case Design

One Group Pre Test Post Test Design

Advantages

- Very simple and convenient
- Most suitable for beginners

Disadvantages

- Very weak to establish cause and effect relationship
- Has very little control

Non experimental research design

- Broad categories of research design

THANK YOU