

Block

2

RESEARCH METHODS IN SOCIAL WORK

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Introduction to Methods of Research in Social Work 5

UNIT 2

**Research Methods I: Descriptive, Exploratory,
Diagnostic, Evaluation and Action Research** 26

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BLOCK INTRODUCTION

Block 2 “Research Methods in Social Work” is the second block of Social Work Research, This block has four units. **Unit 1** is on **Introduction to Methods of Research in Social Work**. We have included discussion on single subject design research, problem formulation, pre-intervention assessment, data analysis, test of significance, experimental research in Social Work, pretest-post test control group design, quasi experimental research design and multiple time series designs.

Unit 2 is on **Research Methods I: Descriptive, Exploratory, Diagnostic, Evaluation and Action Research**. It deals with descriptive research, correlational studies, action research, diagnostic research, exploratory research, steps involved in experimental research etc.

Unit 3 is on **Research Methods II: Experimental Research**. In this unit an extensive coverage is given to steps involved in experimental research, pre-experimental design, true experimental design, quasi experiment design and factorial design.

Unit 4 is on **Research Methods III: Qualitative Research**. This unit deals with the procedural uniqueness of qualitative research, main steps of qualitative method, issues regarding trustworthiness and objectivity in qualitative research, case study method, participatory research and relationship methods.

The units of this block have been aptly chosen to help you to understand research methods in social work. These methods will become useful to social work professionals intending to pursue research studies leading to M. Phil and Ph. D. It will also be useful for NGO functionaries interested in preparing project proposals based on empirical studies.

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UNIT 1 INTRODUCTION TO METHODS OF RESEARCH IN SOCIAL WORK

Structure

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Single Subject Design Research
- 1.3 Experimental Research Designs
- 1.4 Let Us Sum Up
- 1.5 Check Your Progress: The Key
- 1.6 Further Readings and References

1.0 OBJECTIVES

On the completion of this Unit, you should be able to:

- describe the single subject designs research and its process;
- describe different types of single subject designs;
- explain the concept of evaluation research; and
- describe different types of evaluation research designs.

1.1 INTRODUCTION

The ultimate goal of practice of social research is to improve the social functioning of individuals, groups and communities. In brief, the process of improving social functioning of individuals, groups and communities involves study, assessment, intervention and evaluation. In most cases, these steps require use of research methods in general, and measurement techniques in particular, such as rating scales, score analysis, statistical significance etc. The purpose of this Chapter is to describe some special research methods, also known as intervention research methods, It is commonly known as single-subject designs research, through which social researchers attempt to improve social functioning of individuals, groups, families and communities.

1.2 SINGLE SUBJECT DESIGN RESEARCH

Single subject designs research is basically quasi-experimental research, which uses time series analysis technique of social research to the evaluation of the impact of interventions on individual cases, groups, family and community. Such designs involve repeated measure of the dependent variable before and after a particular intervention, to see if a sustained pattern of change in the dependent variable commences shortly after the onset of intervention (Rubin and Babbie, 1989).

The unit of analysis in this design of research is one irrespective of whether the unit of analysis is one individual, one family, one community or one organisation. As such, one of the major limitations of these designs is their dubious external validity.

But we should not forget that single-subject experiments can identify with a high degree of internal validity in those interventions that seem to work in one, perhaps idiosyncratic, context and can be tested for generalisability in subsequent studies. These subsequent studies might include larger scale experiments utilising control groups or they might be additional single-subject experiments that attempt to approximate replications of the original single-subject experiment in other contexts (Rubin and Babbie, 1989)

Such research designs are also termed as “single-case designs”, or “single-system designs”. The latter two terms are used to indicate that subjects need not be individual’s only, but can include a family, a community, and so on. But the term “single-subject designs” is more commonly used and hence will be used in this text with the understanding that it would also apply to cases or systems that may involve groups, family members and a community.

The Background

Prior to single-subject designs, social researchers had no alternative other than to use conventional experimental research designs such as comparison of experimental group with control group. Such experimental researches, however, were often inappropriate or impossible to conduct in practice settings. It was often too time-consuming and expensive to identify clients with similar problems and randomly assign some to treatment and others to control groups.

In such experiments the results were an average of the whole group’s response, obscuring individual reactions which are significant to practitioners. For example, knowing that a given intervention was effective on majority in an experimental group may be interesting, but it does not help at all in inferring about a particular client (Monette et.al.,1986)

In nutshell, single-subject designs aim at systematic evaluation of practice through the use of scientific research techniques. It must be kept in mind, however, that this research design does not reject conventional large-group experimental researches. Such researches are necessary for evaluating completed programmes and for confirming the generalisability of programme effectiveness. In the following sections, we will discuss the stages in the single-subject design research.

Check Your Progress 1

1) What is a Single Subject Design Research?

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The Baseline Phase

The single-subject design researches are based on the principle of time series data analysis. As such, it requires measurements of dependent variable at successive intervals of time. The measurement points before the intervention are called baseline phase. These measurements serve as control; that is, they serve the same function as control groups do in conventional group experiments. The data collected during the baseline phase are compared to the data collected during the intervention (experimental) phase. In order to infer that an intervention is effective – that is, change in the dependent variable can be attributed to the intervention and not to history or maturation – we look for shifts in the trend or pattern of data that coincide with the intervention.

To assess the shift in data-pattern, it is necessary that the data trend in the baseline phase is clear and stable. A trend is one that shows the target problem to be occurring in a predictable and orderly fashion.

The stability of observed trend is identified by plotting the data on a graph, and then observing whether the trend is clearly increasing (Figure A), decreasing (Figure B), cyclical (Figure C) or stable (Figure D).

The Single-Subject Designs – Research Process

Single – Subject designs have many similarities with scientific practice. Single-subject designs also bring in objectivity and empiricism into the practice. By following these research designs, social researchers are in a position to know precisely what intervention was applied and how much effect was produced and to have supporting data for proof. These designs link research and practice by putting the practitioner in the enviable position of not only bringing about change but also having valid evidence as to why the change occurred (Monette, et. al., 1986.p.255). The process of single-subject design research is presented below:

STEP I	: Problem Formulation
STEP II	: Identification of objectives
STEP III	: Selection of Single-Subject Design
STEP IV	: Pre-Intervention Assessment
STEP V	: Intervention Strategies
STEP IV	: Assessment of Intervention Effects
STEP VII	: Drawing of Conclusions.

Fig. 1.1: Steps in Single Subject Design Research Process

Problem Formulation

In the first stage, researcher strives to obtain as clear and specific an understanding of the problem as possible, using various assessment methods and techniques, such as interviewing the individual, his peer group and family members, case history etc.

Identification of Objectives

After the problem is identified, the next step is to determine what objectives are to be achieved through intervention. At this point, the first real difference between the

research-based practice and traditional practice is encountered. In research-based practice it is to be ensured, firstly, that the objectives are measurable in some way and secondly that they are more specific and precisely defined than is often done in conventional practice.

Selection of Single –Subject Design

Once a problem and corresponding objectives for intervention have been identified, the next phase of the research process is to select an appropriate single-subject design that will suit the objectives and constraints of a particular subject.

Pre-Intervention Assessment (Baseline Phase)

Pre – intervention Assessment or needs assessment is a systematic appraisal in evaluating the client's problems, needs and potential solutions. For this, the researcher generally uses one of the standardised rating scales designed to measure the degree or level of target behaviours or problems.

Single-subject designs call for repeated measures of the subject's behaviour or condition so that trends and changes can be noted. Thus, the fourth step in the research process is to establish a baseline or a series of measurements of the subject's behaviour or condition prior to intervention.

Intervention Strategies

In this phase of research, the researcher develops an intervention strategy which aims at modification of behaviour or conditions of the subject. The strategies may include a single intervention or a set of interventions at a time or in succession depending upon the degree of severity of the subject's condition. For example, a researcher may decide to use counselling technique to modify the behaviour of an adolescent student who is at high risk of dropping – out along with other supportive intervention such as facilitation, ventilation of feelings and universalisation.

Once the intervention strategy is decided, the next step is the introduction of intervention. When the intervention is introduced, it is important that only a single, coherent intervention be introduced during any intervention phase (Barlow and Hersen, 1973).

During the intervention phase, the measurement of the subject's condition, started during the baseline phase, is continued. This, of course, is done to track what changes (if any) the intervention is producing in the subject's condition. It is crucial that the conditions under which measurements are made during the intervention phase remain consistent with those under which the baseline measurements were obtained (Jayaratne and Levy, 1979).

Assessment of Intervention Effects

Assessment of intervention effects ascertains whether the intervention strategy has achieved the desired result in the subjects. It reviews all the other components of the process to make an appraisal of the result. It also gives answers to whether the intensity of the problem has reduced, increased or even remained constant.

The last stage of the research process addresses itself to assessing the effects of intervention. Let us assume that higher scores represent improvement, as in the case of 'self esteem'. If the goal of intervention were to increase self-esteem, higher

scores would indicate improvement. A stable baseline is ideal since post-intervention comparisons will then readily reveal intervention effects. If the intervention is helpful, there should be a pronounced upward move in measurement levels. An ineffective intervention would be revealed by little change from baseline levels. The value of a stable baseline is that it allows all three possible intervention outcomes to be readily noted.

Check Your Progress 2

1) What are the steps of Single Design Research Process?

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Types of Single-Subject Designs

Although there are numerous types of single-subject designs, all involve repeated measurements during baseline and intervention phases and a comparison across phases as evidence of intervention effects. The designs differ in the number of phases involved, the number of intervention applied, and the number of baselines employed. Perhaps, the most important differences are in the internal validity of the designs. Some are more capable of providing evidence for the effect of an intervention when such an effect actually exists. Ideally, of course, researchers should select the most valid design that fits their particular case.

There are three alternative single-subject designs:

- 1) AB : The Basic Single Subject Design.
- 2) ABAB : Withdrawal / Reversal Design.
- 3) ABCD : Multiple Component Design.

AB: The basic Single Subject Design

The Basic Single-Subject design as the name suggests, is the simplest single subject design and most popular design among researchers mainly because it involves only one baseline phase (A) and one intervention phase (B) as illustrated below :

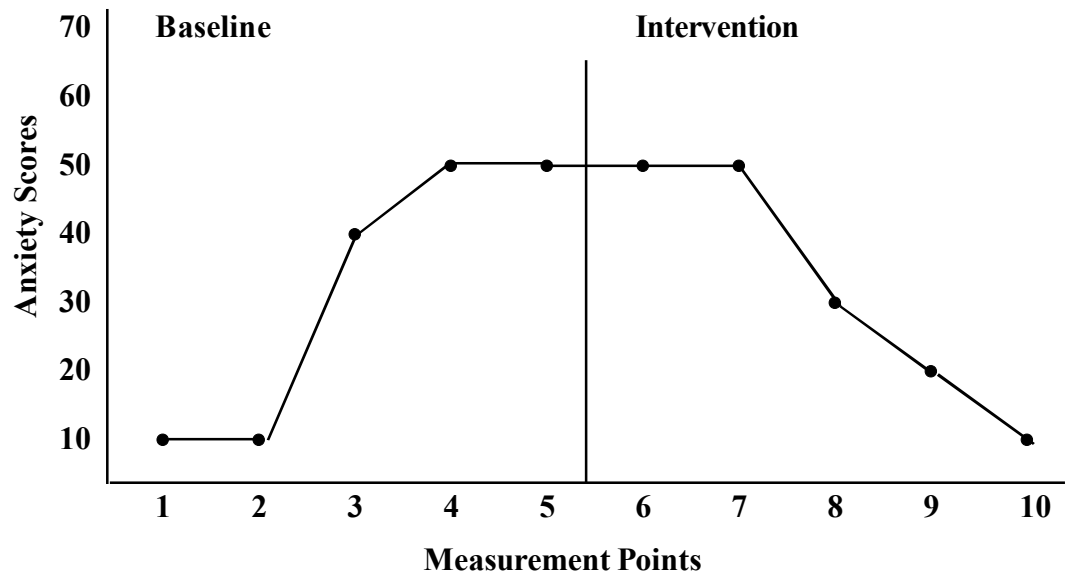


Fig.1.2: Hypothetical Baseline Followed by Successful Intervention

This design is more commonly known as AB design. The letter A signifies baseline phase and a period when intervention is withdrawn in some of the more complex designs. The letter B indicates an intervention phase when some specific intervention is introduced.

In this research design the effects of intervention are ascertained by comparing the client's condition during intervention phase with that of the baseline phase.

Since this design involves one baseline assessment and one intervention phase, its validity is threatened by history : events other than the intervention could be responsible for the change in the client's behaviour.

Despite the limitations of the AB design, it provides better evidence of intervention effects than non-experimental case histories. It also has the advantage of being applicable to most clinical situations, especially in cases where more rigorous designs might be precluded.

Despite its limitations and relative weakness, the AB design provides better evidence of effects than non-experimental case treatment. With enough repeated observations, this design can provide valid and reliable evidence concerning the effectiveness of interventions.

ABAB: Withdrawal / Reversal Design

In order to have better control over extraneous factors withdrawal / reversal design has two baseline phases and two intervention phases. In this research design, after the first intervention is over, it is withdrawn and the second base line phase is established. Once the second baseline is stable the intervention is reintroduced. This design is based on the logic that if there is improvement in the target problem by the first intervention, then the target problem will go back to its original baseline level during the second baseline if the intervention is withdrawn and the target problem should improve when intervention is reintroduced.

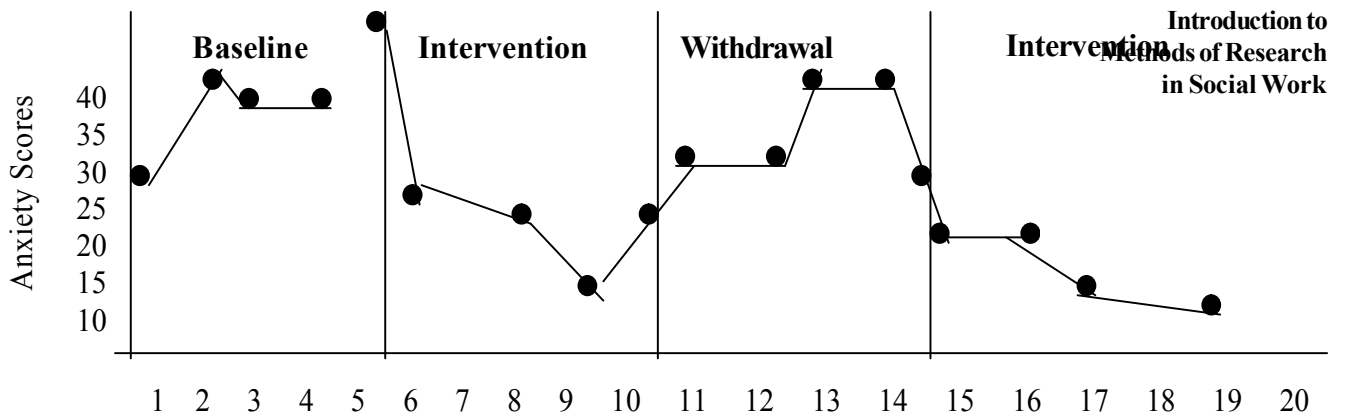


Fig. 1.3: Hypothetical Examples of ABAB Design

The AB design can be strengthened substantially by moving to a reversal design because, after one intervention phase, the intervention is withdrawn for a period of time. There are basically two versions of the reversal design: ABA and ABAB. The two versions differ only in that the ABA design ends in a no intervention phase whereas, in the ABAB design, the intervention is reintroduced a second time.

The value of the reversal designs stems from their ability to demonstrate more conclusively that it is the intervention and not some extraneous factor that is producing change in the client's condition. If the client's condition deteriorates when the intervention is withdrawn, we have evidence that the intervention is the controlling factor. Even more evidence is provided with the ABAB design if the reintroduction of the intervention coincides with renewed improvement of the client. Although it is possible for a set of extraneous factors to produce the first client improvement, it is likely that the same set of factors would recur at precisely the right time to produce improvement on reintroduction of the intervention. As figure C illustrates. Especially with the ABAB design, we would have great confidence in the efficacy of an intervention that produced similar real life results.

This research design has higher strengths on internal validity when compared with the AB design. However, there are practical problems that restrict the use of ABAB designs. First, the changes in client's due to first intervention which are more or less, permanent in nature cannot be put in reverse order. Second, putting clients to their baseline is not only unwise but it is also unethical.

ABCD : Multiple Component Design

The multiple component designs, are designed to handle special problems in different situations. These designs are commonly known as specialised designs and symbolised as ABCD design where B, C, D stands for alternative interventions.

These designs are basically used to evaluate the impact of changes in the intervention and modify the intervention that does not appear to be effective. Conversely, the researcher seeks to determine which intervention package is really responsible for the improvement in the target problem. Let us consider the problem of a client who is an alcoholic. Say for example, first we introduce problem experiencing in relation to drinking behaviour as a treatment (B) and find that it is not effective. Then we try the costs and benefits of drinking behaviour as a technique (C) in its place. Suppose, there still is no improvement then method for resolving drinking problems is used. The process describes a typical ABCD designs.

A → Baseline

Interventions

B → Problems Experienced in relation to Drinking Behaviours

C → Costs and Benefits of Drinking Behaviours

D → Methods for Resolving Drinking Problems

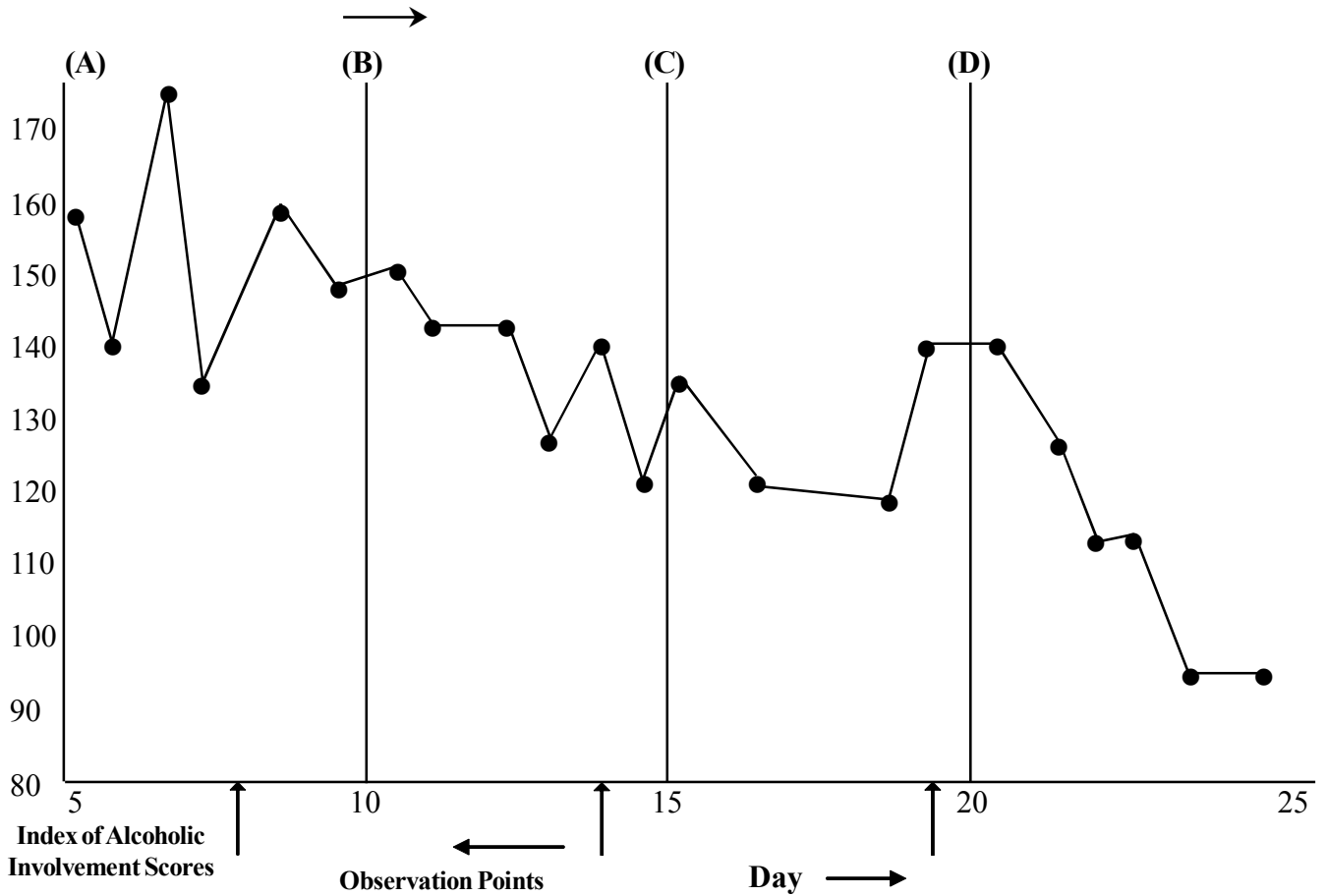


Fig. 1.4: Hypothetical Example of the Multiple Component Design

Check Your Progress 3

1) What are the types of Single Subject Design Research?

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Data Analysis

The results of single-subject experiments are presented in graphic form. In analysing data from the graph, generally, we look for pattern or trend of data and the slope of the line graph. When we analyse the meaning of a graph we look for the data pattern and its trend so that we can see the shifts in the target problem when intervention is introduced. That is, we try to get evidence for supporting that the intervention is affecting the target problem.

The point in analysing data through graph is the slope of the curve. That is the examination of the curve with reference to an axis of the graph (generally 'Y' axis). With reference to single subject design the slope is examined by comparing the proportion of data above and below the line showing the slope.

Both these points are further explained in the following section, which discuss about significance of data. The trend or slope analysis of observed data tells us whether a particular intervention, has caused the change or whether the change is caused by chance variation.

Tests of Significance for Single Subject Research Designs

There are a number of statistical procedures for testing the significance of change caused by interventions. Two procedures, namely, two- standard deviation method and Celeration line approach method, which will be discussed in this section, are most popular among researchers mainly because they involve simple mathematical operations:

Two- Standard Deviation Method

The two-standard deviation procedure is based on the presumption that if the difference between the average baseline value and the average intervention values are larger than twice the value of the standard deviation then the changes in the target problem is not due to chance. This procedure is used if the data-points are not dichotomous and the baseline trend is relatively flat or cyclical. It should not be used when there is a pronounced trend in the baseline.

The steps for computing Two Standard Deviation is given below :

- 1) Compute arithmetic mean of the baseline score.
- 2) Find standard deviation (SD) of the scores by using the formula

$$SD = \sqrt{\frac{\sum d^2}{n-1}}$$

- 3) Multiply the SD by 2
- 4) Find out $\bar{X} \pm 2 SD$
- 5) Calculate the difference between the baseline mean and intervention mean.

Let us take an example of scores obtained by a social worker in a single-subject design research. In a study mean baseline scores and standard deviation were found to be:

$$\bar{X} \text{ (Mean Baseline Score) } = 57.2 \text{ and } SD = 2.29$$

Therefore

$$\begin{aligned}2SD &= 2 \times 2.29 \\ &= 4.516 \\ &= 4.6 \\ &= \bar{X} \pm 2SD \\ &= 57.2 + 4.6 = 61.8 \text{ or } 52.6\end{aligned}$$

Method of Celeration Line Approach

Test of significance through celeration line approach is based on the assumption that the data would continue increasing or decreasing at the same rate it was in the baseline phase. As such, this test of significance is used when the slope of baseline is clearly showing increasing or decreasing trend of the data.

This test of significance is carried out in two stages. In the first stage, the slope of the baseline is determined and it is extended into the intervention period. Then, in the second stage, the proportion of data points above or below the line showing the slope of baseline to the proportion during the intervention phase.

The procedure involves the computation steps suggested by Gingerich and Feyerherm (1979).

- 1) Construct a chronological graph of the baseline scores.
- 2) Divide the baseline in half chronologically. (If there is an odd number of baseline data points, do not include the middle point in either half.)
- 3) Calculate the mean score of each half.
- 4) Plot the mean of each half at the chronological halfway point of each half (the one-quarter and three-quarter points of the overall baseline).
- 5) Draw a straight line connecting the two points plotted in step 4.
- 6) Extend the above line from the beginning of the baseline to the end of the intervention period. This is the celeration line.
- 7) Calculate the percentage of baseline observations that fall in the desired zone. The desired zone is above the celeration line if we are looking for an increase in the data points and below the celeration line if we are looking for a decrease.
- 8) Count the total number of data points in the intervention period.
- 9) Count the number of data points that fall in the desired zone during the intervention period. (See number 7 for definition of desired zone.)
- 10) Examine the cell entries in Appendix A to see if the proportion of data points in the desired zone is significantly greater during intervention than during baseline.

To rule out the possibility of change variation a number of statistical procedures have been evolved. However, some statistical procedures require a large number of measurements of observation points, which makes it impossible for researchers to use. Yet, some other statistical procedures are highly controversial.

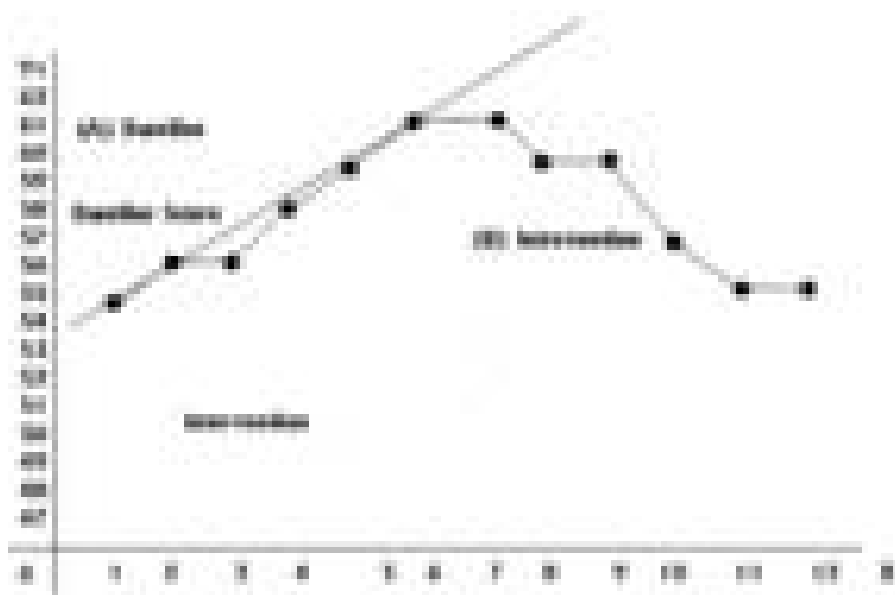


Fig. 1.5 : Chronological Graph Showing Celeration Line

Before we draw our conclusions we have to ascertain that the change in the target problem is not due to chance variation. In other words, we have to ascertain that the difference between baseline and intervention levels is too great to be due to chance variation. The procedure to rule out the chance factor is known as the test of statistical significance.

Generalisability of Single-Subject Designs

The ultimate goal of a scientific research is generalisability of the findings of the study. In social research, findings which are generalisable to a considerably large number of situations and cases can only contribute to the knowledge base of practice.

Interestingly, in single-subject designs research even if it is proved that the interventions were effective, there is no guarantee that the same intervention would be effective on other clients in different settings. This limitation of single-subject designs research, however, does not discourage social researcher because generaliability of findings can be achieved through repeating the study by taking more measurements.

Check Your Progress 4

1) What is Tests of Significance for Single Subject Research Designs?

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1.3 EXPERIMENTAL RESEARCH DESIGNS

Experimental researches are designed for testing causal relationships. A causal relationship refers to relationships between two variables where one variable (characteristic or occurrence) X determines another variable (characteristic or occurrence) Y. For example, if a researcher wishes to test a causal relationship that punishments (X) cause low self-esteem (Y) by comparing a group of students who have been exposed to punishments (X) with one that has not been exposed, he has to measure the two groups with respect of Y, either during or after exposure to X.

The Logic of Causal Inference

To clarify the issues raised above, we have to understand the logic of causal inference. The three conditions that have to be fulfilled to draw a causal inference are :

- If
- 1) the cause precedes the effect in time,
 - 2) there is an empirical correlation between them,
and
 - 3) the relationship is not found to be the result of the effects of some third variable on each of the two initially observed variables.

The first condition in a causal relationship is that the cause precedes the effect in time. For example, in the game of snooker, the first impulsion is the cause of movements of the second ball and the subsequent balls. The movements of second and subsequent balls are the effect of the cause induced by the impulsion

The second condition in a causal relationship is that the two variables may be empirically correlated with one another. For example, if a researcher wishes to examine if there is cause-effect relationship between gender and achievement, he or she has to use correlational technique to assess the magnitude of the relationship. It is also required that the coefficient of correlation is substantial.

The third condition for a causal relationship is that the observed empirical correlation between two variables cannot be explained away as being due to the influence of some third variable that causes both of them. For example, it may be observed that there is a strong correlation between 'knee joints pain' and 'amount of rainfall' but this does not mean that joints pain effect rainfall. A third variable, relative humidity is the cause of both knee joints pain and rainfall. Any relationship satisfying all these conditions is causal, and these are the only conditions of cause –effect relationship.

Types of Experimental Research Designs

There are a large number of experimental designs. Various authors have grouped experimental designs into certain categories based on extent of control. Most common grouping comprises:

- True Experimental Designs,
- Pre-Experimental Designs, and
- Quasi Experimental designs

In this chapter we will discuss the first category of experimental designs that is True Experimental Designs. The other two categories of experimental designs will be discussed in the next chapter.

True Experimental Designs

True Experimental Designs have maximum control and hence highest degree of internal validity. The essential components of an experimental research design involve (a) random assignments of subjects to experimental and control groups, (b) introducing the stimulus (independent variable) to the experimental group while withholding it from the control group, and (c) comparing the amount of change in dependent variable in experimental and control groups.

Pre-Test, Post-Test – Control Group Design

The classic experimental design, which is also known as pre-test-post-test control group design can be shown in shorthand notation as:

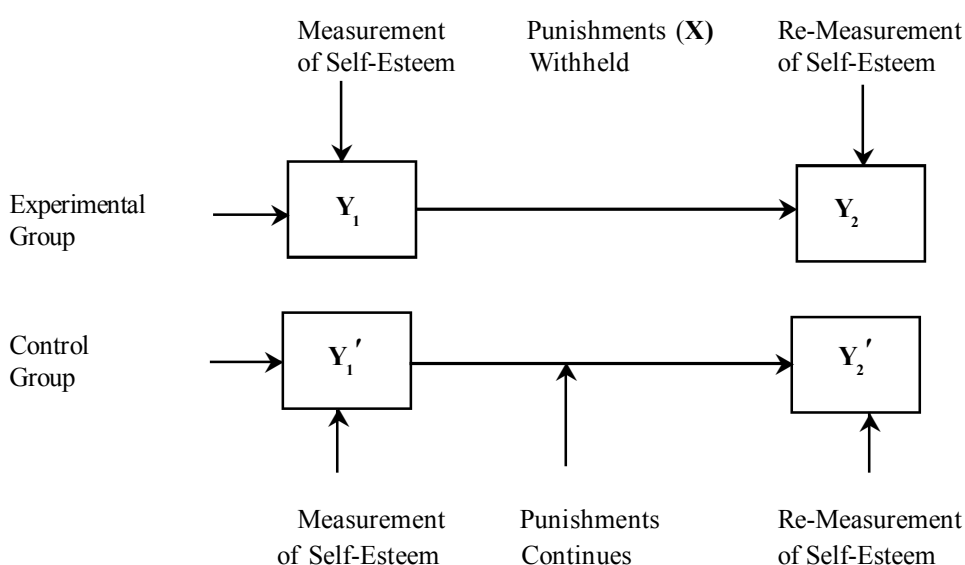
$$E \longrightarrow R \longrightarrow Y_1 \longrightarrow X \longrightarrow Y_2$$

$$C \longrightarrow R \longrightarrow Y'_1 \longrightarrow \text{Non-X} \longrightarrow Y'_2$$

E and C represent experimental group and control groups respectively. R stands for random assignments of subjects to either experimental group or the control group. The notation X represents the introduction of a stimulus, Y_1 's represent pre-tests and the Y_2 's represent post-tests. In this design, experimental group and the control group subjects are measured on a dependent variable before and after the introduction of stimulus.

Suppose, for example, a researcher wishes to test a hypothesis that punishments lead to low self-esteem using pre-test-post-test control group design. To test the hypothesis first he/she has to select a sample of students preferably from one particular class, say, 10th Standard. Then he/she has to randomly assign the subjects to either the experimental group (E) or the control group (C). Now both the groups are measured for their self-esteem (Y_1, Y'_1). Punishments (X) are withheld for students who are in experimental group. Later, both the groups are measured and compared for self-esteem (Y_2, Y'_2). If there is a significant difference in the pre- and post- self-esteem scores it can be concluded that suspension of punishment had an effect on self-esteem. Further, if it is observed that the average post self-esteem scores of students in group E is comparatively lower than the students in group C then the hypothesis that punishments lead to low self-esteem will be accepted.

The pre-test-post-test control group design, is diagrammed as shown below :



Effects on Experimental Group (D_1) = $Y_2 - Y_1$

Effects on Control Group (D_2) = $Y'_2 - Y'_1$

Net Effects = $D_2 - D_1$

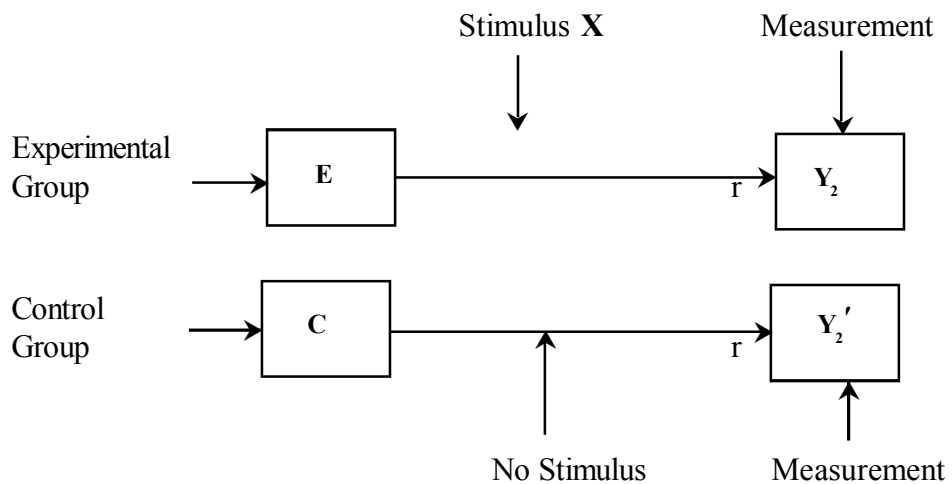
The Post-test- Only Control Group Design

The Post-test- Only Control Group Design is modification of Solomon Four- Group Design by removing the pre-testing of the groups. In shorthand notation it can be shown as:

E → R → X → Y
C → R → Non-X → Y'

This design is used to nullify the effects of repeated testing which often enhances the performance without any corresponding improvement in the variable under examination. In this design the subjects are randomly assigned to either the experimental group or the control group and are measured during or after the introduction of the stimulus (the independent variable).

The post –test only control group design, is diagrammed as shown below :



Suppose, for example, that a researcher examining the effects of punishments on the self – esteem of the students selects a sample of subjects who are randomly assigned to either of the two groups. One group is not subjected to punishments and later both groups are measured for their self-esteem and their scores are compared. A significant difference will indicate that suspension of punishment had an effect on self –esteem.

Pre-Experimental Research Designs

Research designs in which most of the sources of internal and external validity are not controlled are termed as Pre-Experimental Research Designs. These designs are the weakest kind of research designs. In fact, the risk of drawing causal inference from these designs is extremely high. Still they are used quite often in social research. These designs help to illustrate the advantages of experimental research designs.

Types of Pre-Experimental Designs

The three very commonly used Pre-Experimental Designs are :

- 1) One Shot Case Study
- 2) One Group Pre-test, Post-test Design
- 3) The Post-test Comparison Group Design

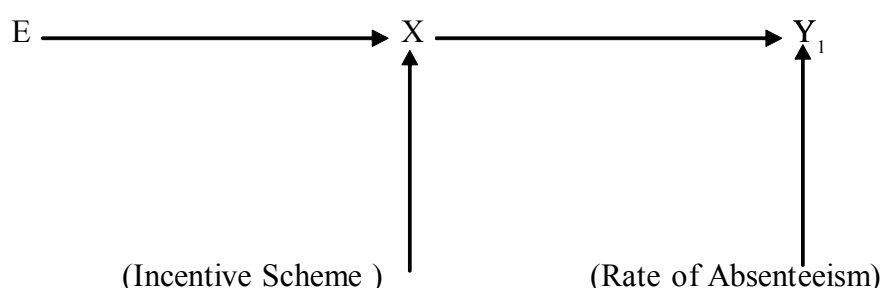
One Shot Case Study

The shorthand notation for One Shot Case Study design is :

$$X \longrightarrow Y$$

The X in this notation represents the introduction of stimulus. The Y represents the measurement of dependent variable. In this research design, a group of subject is measured on a dependent variable after the introduction of stimulus. In this design it is not possible to ascertain if the change in the dependent variable is higher (or lower) than it was before the introduction of stimulus. It also does not tell that there is no change among the comparable subjects where stimulus was not introduced. Thus, this design fulfills only two of three conditions of causal inference, that is, *time order* and *correlation*. Hence, we cannot rule out the possibility that the extraneous variables caused the observed change.

For instance, to solve the problem of absenteeism, an incentive scheme is launched for the employees who are found to be chronic absentees. After a month or so the attendance is checked. In case there is decrease in rate of absenteeism, it can be inferred that the decrease in the rate of absenteeism is because of new incentive scheme. This example may be shown diagrammatically as:



One Group Pre-test, Post-test Design

The shorthand notation for this design is:

$$Y \longrightarrow X \longrightarrow Y_1$$

The notations Y and Y₁ refer to the measurement before and the measurement after the introduction of stimulus. In this design the dependent variable is measured before and after the introduction of stimulus is introduced. Although this research design measures *time-order*, *correlation* and *control* for internal factors, it does not take into account factors other than the independent variable that might have caused the change between pre-test and post-test results. The factors that might have caused the change may be associated with the various threats to the internal validity, such as, history, maturation, testing and statistical regression.

Suppose, we wish to assess the effect of cognitive behaviour intervention on abusive parents and we decide to undertake the study using One Group Pretest -Posttest Design. The shorthand notation for this design may be diagrammed as shown below:

$$E \longrightarrow Y_1 \longrightarrow X \longrightarrow Y_2$$

Where:

X → Independent Variable (Intervention)

Y_1 → Dependent Variable before introduction of X (Pre-Test)

Y_2 → Dependent Variable after introduction of X (Post Test)

E → Experimental Group

To conduct the study, first we select a group of abusive parents and measure their parenting skills and cognition about childhood behaviours. The test is followed by introduction of Cognitive Behavioural Intervention with the abusive parents. After a specified period of intervention its effects on parental skills are assessed. If it is found that there is significant increase in the parental skills scores of the abusive parents we may infer that the change in the score is due to the intervention.

The Post-test Comparison Group Design

The third commonly used pre-experimental research designs involves post-test measurement only but does employ a comparison group. The term comparison group denotes a group which is not formed by random selection of subjects and whom experimental manipulation is not performed. This research design can be symbolised as follows:

E → X → Y_1

C → Y'_1

In example mentioned above if we compare the parenting skills and cognition about childhood behaviours of the group of abusive parents who participated in experiment with the parenting skills and cognition about childhood behaviours of a group of abusive parents who did not, it exactly demonstrates, the post-test comparison group design of research. The comparison group is usually chosen to be as similar as possible to the group that was introduced to the intervention. The example may be shown diagrammatically as :

E → X → Y_1

C → Non-X → Y'_1

Where:

X → Independent Variable (Cognitive Behaviour Intervention)

Y_1 → Dependent Variable (Parental Skills) before introduction of X (Pre-Test)

E → Experimental Group

C → Comparison Group

One serious disadvantage of this design is that the groups were not equivalent before introduction of the stimulus (intervention) . In other words, it is possible that the subjects in the two groups might have differed initially with respect to the dependent variable measured (parenting skills and cognition about childhood behaviours)

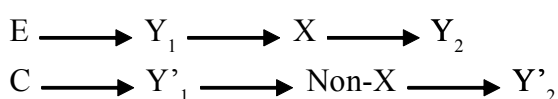
The internal validity of the three pre-experimental research designs discussed in the preceding sections is weak. Hence, causal inference drawn from pre-experimental research designs is inconclusive.

Quasi-Experimental Research Designs

Many a times it is not possible to achieve random assignments of subjects to experimental and control groups and withhold stimulus (intervention) to one group (control group). In such cases, instead of foregoing the study altogether, it is sometimes possible to create and execute alternative research designs that have less internal validity than experimental research designs but still provide reasonably good amount of evidences for causal inferences. These designs are called quasi-experimental research designs and are distinguished from experimental research designs due to lack of random assignments of subjects to experimental and control groups. In this section , we will discuss some quasi-experimental research designs that are applicable to social research.

Pre-test Post-test Non-equivalent Control Group Design

When it is not possible to divide subjects into experimental and control groups by random assignments, we try to get an existing control group (comparison group) that appears to be similar to experimental group. This research design is commonly called as Pre-test Post-test Non-equivalent Control Group Design and can be symbolized as follows:



Where :

X \longrightarrow Independent Variable (Intervention)

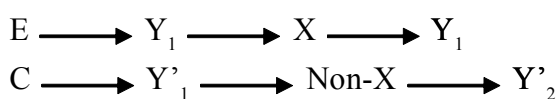
Y_1 \longrightarrow Dependent Variable before introduction of X (Pre-Test)

Y_2 \longrightarrow Dependent Variable after introduction of X (Post Test)

E \longrightarrow Experimental Group

C \longrightarrow Comparison Group

Suppose we wish to evaluate the effects of an intervention (say, counselling) on level of loneliness of residents of a Home for the Aged. It is unlikely that we would be permitted to select randomly in any Home for the Aged those residents who will be given counseling and those who will not be given. As an alternative, we may find two Homes for the Aged that agree to participate in our research study and which appear to be very similar apparently in all respects. That is we make sure that the inmates in two homes are very similar in terms of age, socio-economic status, mental and physical disabilities, psychological functioning, and so on. We can introduce the intervention in one home, and use the other as a comparison group. The two homes could be compared by a pre-test measurement to make sure that they really are equivalent on the dependent variable before introducing the intervention (independent variable). If their average loneliness scores are approximately same, then it would be reasonable to infer that differences in post-test scores are due to the effects of intervention. The example may be shown diagrammatically as:



Where:

X Independent Variable (Intervention : Counselling)

Y_1 Dependent Variable before introduction of X (Pre-Test)

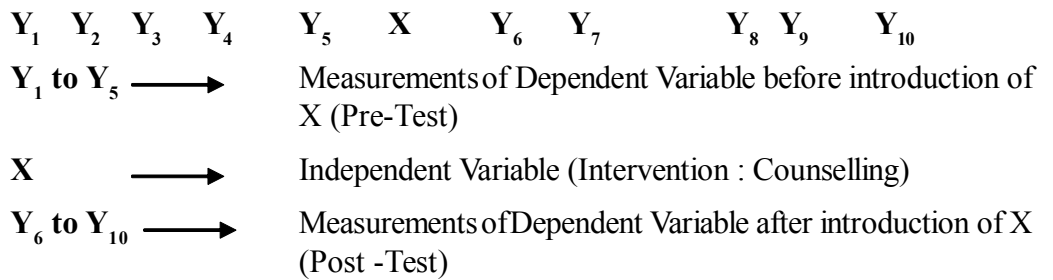
Y_2 Dependent Variable after introduction of X (Post Test)

- E Experimental Group
- C Comparison Group

Time-Series Designs

Simple Time-Series Designs

When comparison group is not available for assessing cause-effect relationship — Time-Series Designs can be used. In Time-Series Designs pre-test and post-test measures are taken a number of times before and after the introduction of stimulus. Usually the researcher attempts to obtain at least five sets of measures before and after the introduction of independent variable. A typical time series design can be represented as follows:



The above diagram indicates that the dependent variable was measured at five points in time before the intervention (X) was introduced and at another five points after that.

To illustrate the Time-Series Design we will take a group of students whose morale has been observed as very low. First, we will measure the morale of students by using a standardized scale. The measurement will be repeated another four times with an interval of a week. After recording the fifth observation, the intervention (a play which has been tested for boosting morale of students) is introduced. After completion of the intervention the dependent variable (morale in this case) is measured five times with an interval of a week. These measurements can be compared with the measurements recorded before the intervention to infer if there is significant change in the dependent variable. In case there is significant increase in the morale of students after witnessing/ participating in the play it can be inferred that it has been caused by the intervention (the play). The simple set of data is presented graphically in Figure given below

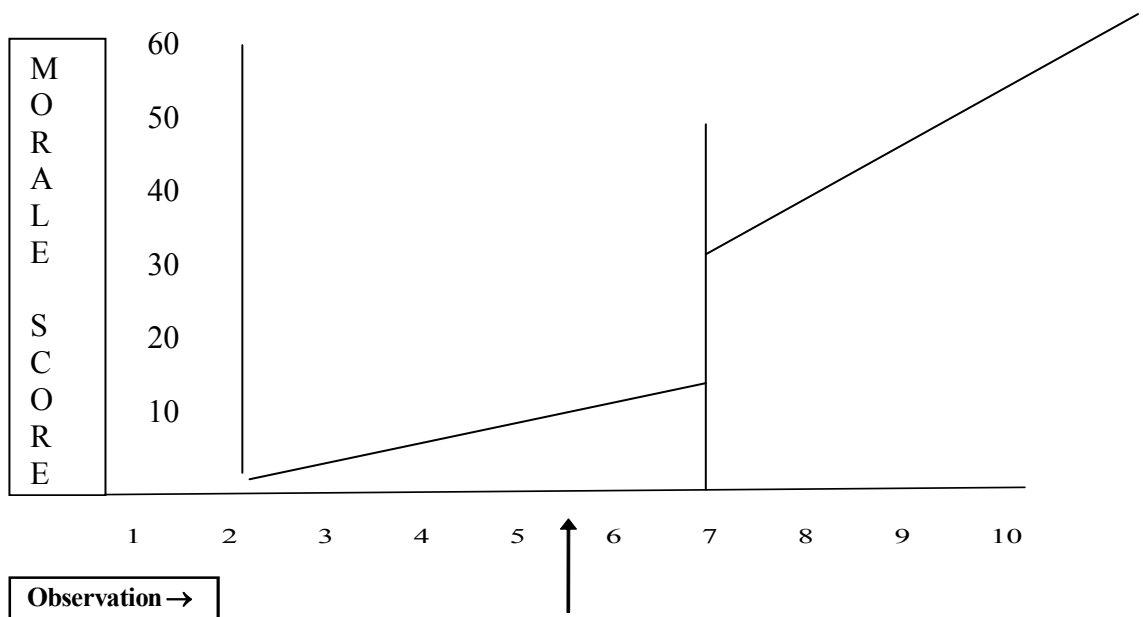
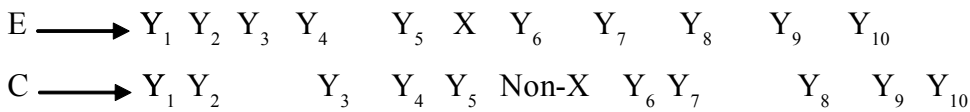


Fig.1.6 : Time Series Design

Multiple Time Series Design

Multiple Time Series Design is another form of time series design with greater internal validity. The shorthand notation for this design is :



In this design both an experimental group and a non-equivalent comparison group are measured at multiple points in time before and after intervention are introduced in the experimental group.

We will consider a hypothetical study of children at risk (severely underweight) to illustrate the multiple time-series design. In this study, first age and weight of children in two communities are measured and children at risk are identified. The measurements are repeated for five times with an interval of a week or so. After recording the fifth observation, the intervention (a supplementary nutrition programme) is introduced in one of the communities. On completion of the intervention, the dependent variable (weight) is measured five times with an interval of a week. These measurements can be compared with the measurements recorded before the intervention to infer if there is significant change in the dependent variable. In case there is significant increase in the weight of the children after implementing the supplementary nutrition programme it can be inferred that it has been caused by the intervention. To substantiate the causal inference the results can be compared with the measurements of the children of other community where the programme was not implemented.

Check Your Progress 5

1) What is Experimental Research Design

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1.4 LET US SUM UP

Single subject designs research uses time series analysis technique for the evaluation of the interventions on individual cases, groups, family and community. Such designs involve repeated measurement of the dependent variable before and after a particular intervention, to see if a sustained pattern of change in the dependent variable commences shortly after the onset of intervention.

The process of single-subject design research involves Problem Formulation, Identification of objectives, Selection of Single-Subject Design, Pre-Intervention Assessment, Intervention Strategies, Assessment of Intervention Effects and Drawing of Conclusions.

There are three important single-subject designs, namely, (1) AB: The Basic Single Subject Design, (2) ABAB: Withdrawal / Reversal Design and (3) ABCD: Multiple Component Design..

Experimental research are designed for testing causal relationships. A causal relationships refers to relationships between two variables where one variable (characteristic or occurrence) X determines another variable (characteristic or occurrence) Y.

There are a large number of experimental designs. They can be grouped into three categories based on extent of control; True Experimental Designs, Pre-Experimental Designs, and Quasi Experimental designs.

1.5 CHECK YOUR PROGRESS: THE KEY

Check Your Progress 1

Single subject designs research is quasi-experimental research which uses time series analysis technique for the evaluation of the interventions on individual cases, groups, family and community. Such designs involve repeated measurement of the dependent variable before and after a particular intervention to see if a sustained pattern of change in the dependent variable commences shortly after the onset of intervention

Check Your Progress 2

The process of single-subject design research involves problem formulation, identification of objectives, selection of Single-Subject Design, pre-intervention assessment, intervention strategies, assessment of intervention effects and drawing of conclusions.

Check Your Progress 3

There are three Single Subject Research Designs, namely, AB: The Basic Single Subject Research Design, ABAB: Withdrawal/Reversal Single Subject Research Design and ABCD: Multi component Single Subject Research Design.

Check Your Progress 4

Tests of significance of data tell us whether a particular intervention, has caused the change or whether the change is caused by chance variation.

Check Your Progress 5

Experimental research is designed for testing causal relationships. A causal relationships refers to relationships between two variables where one variable (characteristic or occurrence) X determines another variable (characteristic or occurrence) Y.

1.6 FURTHER READINGS AND REFERENCES

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UNIT 2 RESEARCH METHODS I: DESCRIPTIVE, EXPLORATORY, DIAGNOSTIC, EVALUATION AND ACTION RESEARCH

Structure

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Descriptive Research
- 2.3 Evaluation Research
- 2.4 Action Research Designs
- 2.5 Diagnostic Research Studies
- 2.6 Exploratory Research Studies
- 2.7 Let Us Sum Up
- 2.8 Check Your Progress: The Key
- 2.9 Further Readings and References

2.0 OBJECTIVES

After the completion of this Unit, you should be able to:

- describe the descriptive research;
- explain the features of descriptive research studies;
- understand the meaning of evaluation research studies;
- describe the types of evaluation research studies;
- understand the meaning of action research studies;
- describe the characteristics of action research; and
- understand the meaning of exploratory and diagnostic research studies.

2.1 INTRODUCTION

We discussed about ‘social work research methods’ in the previous Chapter. In this Chapter we shall discuss Descriptive Method and Experimental Method of research in detail.

2.2 DESCRIPTIVE RESEARCH

Descriptive research studies are designed to obtain information concerning the current status of a given phenomenon. They are concerned with the existing conditions or relationships, prevailing practices, current beliefs, points of view or attitudes, processes

that are going on and their effects and the developing trends. In short, it determines the nature of a situation as it exists at the time of study. The aim of descriptive research is to describe “what exists” with respect to variables or conditions in a situation.

The descriptive research method is appropriate in behavioural sciences. Many types of behaviour that interest the researcher cannot be arranged in a realistic setting. For example, it would be unthinkable to prescribe cigarette smoking for the purpose of studying its possible relationship to throat or lung cancer, or deliberately arrange accidents, in order to evaluate the effectiveness of seat-belts or helmets in preventing serious injuries.

Although some experimental studies of human behaviour can be appropriately carried out, both in laboratory and in the field, the prevailing method used in social sciences is descriptive. Under the conditions that naturally occur at home, inside the classroom, on the playground or within the community, human behaviour can be systematically examined and analysed. This analysis may lead to the modification of factors or influences that determine the nature of human interaction. It is through this modification of factors that social institutions may exercise more effective influences in promoting human welfare.

Check Your Progress 1

1) Describe briefly the meaning of descriptive research studies.

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Correlational Studies

Human behaviour at both individual and the social level is characterised by great complexity. However, given the present state of social research, we understand too little of this complexity. One approach to a fuller understanding of human behaviour is to begin by testing out simple relationships between those factors and elements which are supposed to have some bearing on the phenomenon in question. The value of correlational research is that it is able to achieve this end. We know that one of the primary purposes of science, as conceived traditionally, is to discover relationships among phenomena with a view ultimately to predicting and, in some situations, controlling their occurrence.

Much of social sciences research is concerned at our present stage of development with the first step in this sequence, i.e., establishing interrelationships among variables. Correlational studies are concerned with determining the extent of relationship existing between variables. They enable us to measure the extent to which variations in one variable are associated with variations in another. We may wish to know, for example, how delinquency is related to social and class background, or whether a relationship exists between the number of years spent in full-time education and subsequent annual income, or whether there is a link between personality and achievement.

Correlational studies are generally intended to answer three questions. These are:

- a) Is there a relationship between two variables (or two sets of data)? If the answer to this question is 'yes', then other questions follow:
- b) What is the direction of the relationship? and
- c) What is the magnitude of the relationship? The magnitude of the relationship is determined by the coefficient of correlation.

For instance, on the basis of his/her experience, a researcher may hypothesize that there is a relationship between performance in an intelligence test and a test of achievement in arithmetic. The correlational technique will help him test his/her hypothesis about the relationship. Pearson's product moment, one of the best known measures of association, is a statistical value of the coefficient of correlation ranging from -1.0 to $+1.0$, through zero and expresses relationship in quantitative form. Where the two variables fluctuate in the same direction, i.e., as one increases so does the other, a **positive** relationship is said to exist. A **negative** correlation or relationship, on the other hand, is to be found when an increase in one variable is accompanied by a decrease in the other variable. The values near zero indicate a weak relationship between the variables, whereas values closer to either $+1.0$ or -1.0 indicate a stronger relationship in either of directions. Thus, the coefficient of correlation, tells us something about the relationship between two variables. However, other measures exist which allow us to specify relationship when more than two variables are involved. These are known as measures of **multiple correlation** and **partial correlation**. (We will not go into details about these measures over here.)

One danger in interpreting correlations is to assume that because two variables are related in a predictable fashion to one another with a high degree of probability, they are also in a causal relationship. This is not necessarily the case. For one thing, there is never more than a probable relationship between variables in any case. For another, it is quite possible for two variables to be related to one another with a high degree of probability but with a third variable accounting for the nature of relationship. Correlation must not be interpreted to mean that one variable is causing the scores in other variable to be what they are. For example, it may be found that there is a negative correlation between measures of anxiety and measures of intelligence. It should not be interpreted that there is a causative relationship between anxiety and intelligence; that is, that pupils are anxious because they are unintelligent or that pupils appear unintelligent because they are anxious. It might be that there are other underlying characteristics of individuals that tend to make some appear unintelligent and anxious, and others, intelligent and not anxious. Interpretation of such a correlation is difficult without experimental confirmation, For example, the relationship between anxiety measures and intelligence measures could be investigated experimentally by deliberately inducing anxiety in a testing situation and determining the effect on intelligence test scores.

Causal-comparative Studies

There is, at times the need to discover **how** and **why** a particular phenomenon occurs, and not confine our investigation to **what** a phenomenon is like. In this instance, the investigator tries to compare the similarities and differences among phenomena to find out what factors or circumstances seem to accompany or contribute to the occurrence of certain events, conditions or practices.

Unlike a scientist working in a laboratory, a social researcher cannot always select, control and manipulate factors that are necessary to study cause-effect relations. An investigator cannot, for example, manipulate domestic background, social class, intelligence, etc. in situations that do not allow researchers manipulate the independent variable and establish the controls that are required in “true experiments”, they may conduct a causal-comparative study.

In a causal-comparative investigation, a researcher studies a real life situation in which subjects have experienced what he/she wants to investigate. For example, if an investigator wants to study emotional instability, he/she does not place children in a situation where all factors are kept constant except one variable which is manipulated to determine what causes a particular type of emotional disturbance. Rather, he/she chooses children who according to a selected criterion are ‘disturbed’ and compares them with emotionally stable children. After searching for factors or conditions which seem to be associated with one group and not the other, he/she may present a possible explanation of the underlying causes of the emotional problem.

Check Your Progress 2

- 1) Explain briefly the purpose of correlational studies.

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- 2) List the weaknesses of casual-comparative studies.

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2.3 EVALUATION RESEARCH

Voluntary organisations undertake many welfare programmes and provide services to individuals, groups and communities. While they provide the services they are constantly concerned about the outcome of their services: Do they achieve their goals while providing services? A set of questions are raised: Are the services effective? Are these programmes leading to undesirable consequences? Are the services relevant; will these services achieve their predetermined goals? And many such questions puzzle agency administrators. As such, they need some reliable and valid data which can give answers to these questions. The term used for the process of getting these reliable data in assessment using some scientific technique is known as evaluation. Broadly speaking, evaluation is a systematic assessment of progress made by the implementing machinery; an analysis of problems and difficulties arising in the effective implementation of a programme and an indication of the corrective measures necessary.

In a very broad sense, the concept of evaluation research simply connotes use of research methods to evaluate programmes or services and determine how effectively they are achieving their goals. The terms like evaluation research, evaluative research, programme evaluations and evaluation are synonymous, interrelated and hence used interchangeably.

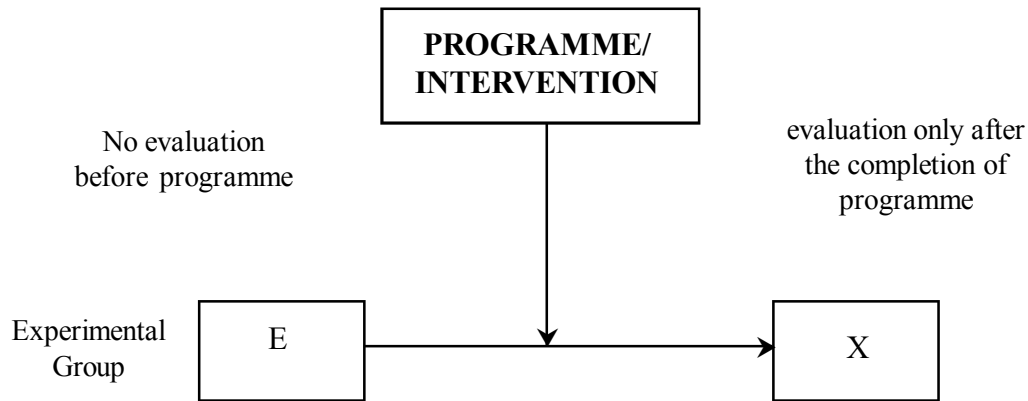
Check Your Progress 3
1) What is Evaluation Research?
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Evaluation Research Designs

Any of the basic research designs, can be used for the purpose of evaluation research with some modifications. However, evaluation research often calls for testing of cause-effect relationship. As such, *experimental designs* are more appropriate for the purpose of evaluation research.

The After-Only Evaluation Design without a Control (Comparison) Group

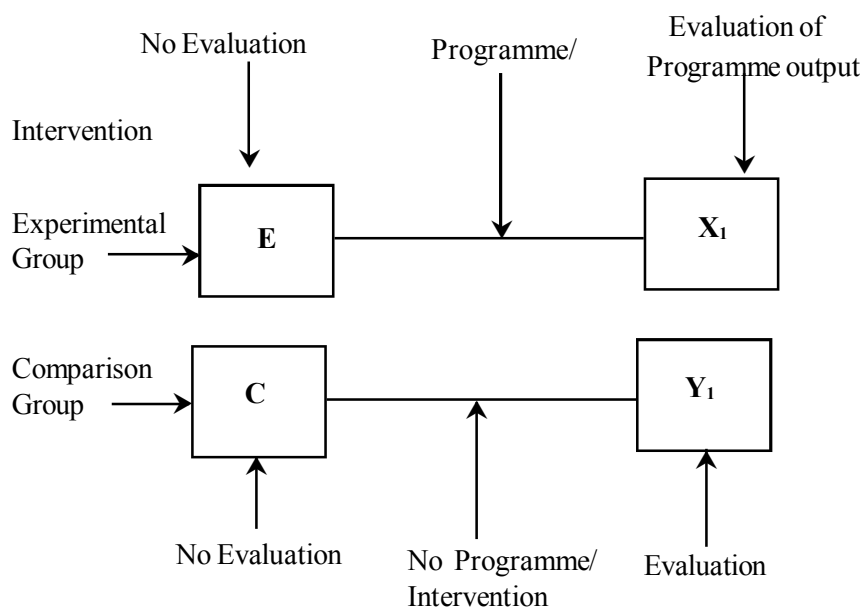
In this study design, the measurements are limited to the target group and taken only once at some point of time after completion of the programme / project activities. This is by far the weakest evaluation design. It is difficult to know whether any change has occurred or to assess the degree to which the changes, if any, can be attributed to the programme / project implementation.



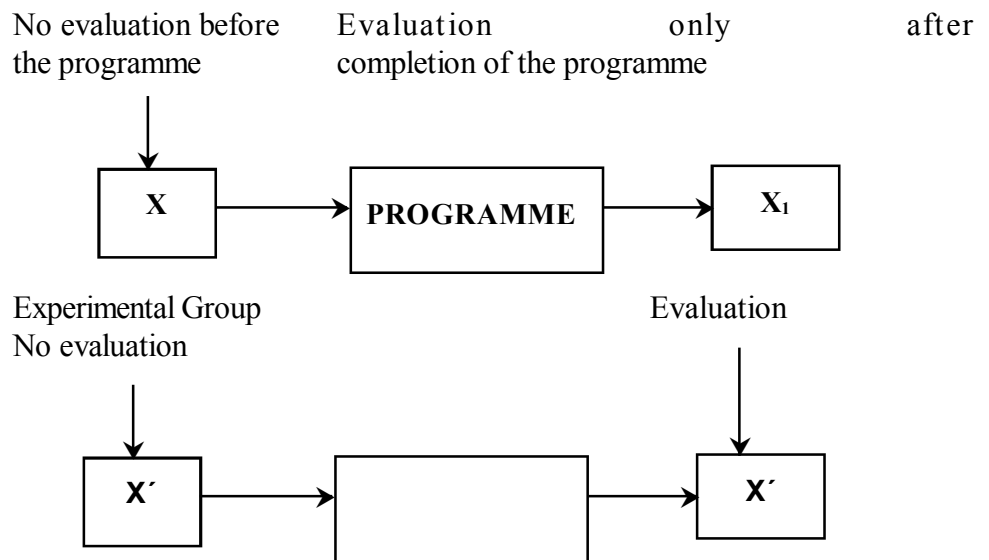
The After-Only Evaluation Design with a Control (Comparison) Group

In this design, a *control group* (comparison group) similar to the *experimental group* for which programme/project activities have been implemented, is selected. Both the groups are measured with respect to the dependent variable only after completion of the programme/project activities.

The major weakness of this design is that the measurements are not taken before the introduction of the programme. Both the groups are assumed to be similar in respect of the 'before' measures on the dependent variable. Hence, it is quite likely that the change in the dependent variable may really be due to the initial differences between the two groups.

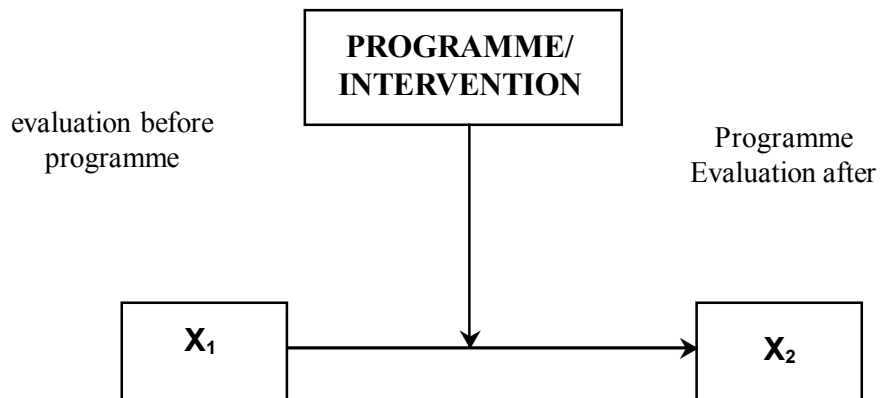


$$\text{Effects} = X_1 - Y_1$$



The ‘Before’ - ‘After’ Evaluation Design without Control Group

This design involves two measurements on the target/treatment group; one before the implementation of the programme / project and another after the completion of the programme / project. The difference between the target group’s positions on the dependent variable [the effect of the programme] is taken as a measure of the effect of the program [dependent variable].

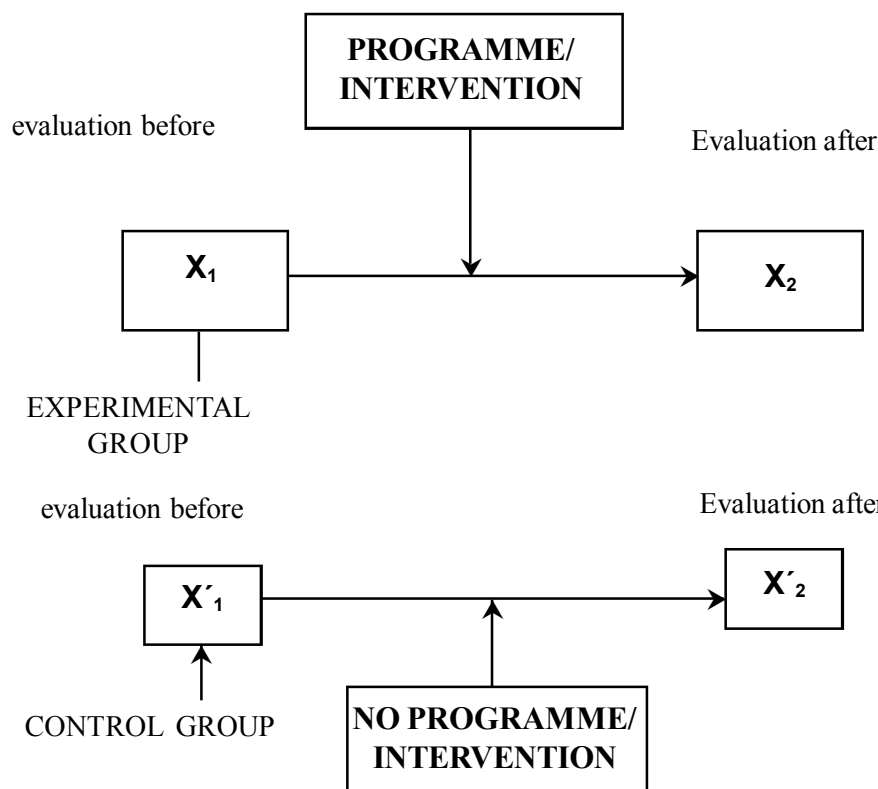


Effect/Impact: $X_2 - X_1$

But it is obvious that external factors unrelated to the programme treatment have been in operation leading to a change in ‘before’ target group’s position on the dependent variable. The ‘before’ measurement itself may change the dependent variable. Thus, the major weakness of this evaluation study design is that it does not distinguish between the effects of the programme activities and effects of external factors or developmental process.

The ‘Before’ - ‘After’ Evaluation Design with Control Group

This study design may involve one, two or more control groups [groups] similar in characteristics where the programme is not being implemented. The variations in control groups arrangements relate to the attempts to take account of contemporaneous events, maturational or natural developmental process and the effects of ‘before’ measurement. In this design of study, both the target group and control group are measured at the beginning and also at the end of the programme / project activities alone.



D_1 (Difference in Target Group) = $X_2 - X_1$

D_2 (Difference in Control Group) = $X'_2 - X'_1$

Effect/Impact = $D_1 - D_2$

Check Your Progress 4

1) Describe the various types of Evaluation Research designs?

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Alternative Evaluation Study Design

The Ex-Post-Facto Evaluation Study Design

The ex-post-facto study design is an attempt to detect causal relationships with data gathered by survey. Here, the evaluator controls the crucial variables only by selecting

one, which has already been recorded. For example, an agency has conducted an opinion survey of adult beneficiaries aged 25 or more, taking their age, gender, place of birth and so on. The Agency authorities are interested in the causal effect of place of birth (the independent variable) on respondent's opinion on the effectiveness of the programme of non-formal education (dependent variable). Through manipulation of data the evaluator achieves some control over the other dependent variable (opinion) and the independent variable (birthplace).

In the ex-post-facto design the evaluator does not have very good control of causal variable, study condition, outside variables and measurement of dependent variable. The major drawback of this study design is that the data gathered by a survey is only a cross-section taken at one point of time, but the casual relationship in question is the link between the person's birth place and his opinion. This is a casual chain that may be of over 25 years' duration and the environment in which the person lived during these years may have varied widely from subject to subject.

Because of the problems encountered in setting up control groups, several alternative impact study designs have been evolved. One of them is differentiation of samples according to degree of 'exposure' and comparison amongst groups characterised by different degrees of exposure. To understand the alternative impact study design we will take up the following example.

In a study of mid-day meals programme where neither there was benchmark data nor was it possible to study a control group, comparing the children who had more exposure to the programme with those who had less exposure helped assess the programme impact. The children with less exposure were treated as a control group. The relationship between the level of programme efficiency and magnitude of impact on the children was tested, the magnitude of impact on the beneficiaries was found to be greater with higher programme efficiency.

Multiple Study Designs

Sometimes, multiple research designs are also used to assess the impact of a programme instead of a single design. For example, while using quasi-experimental design, some evaluators suggest supplementing the outcome with the case studies. By doing so, evaluators are able to capitalise on the merits of both the methods and impact assessment becomes more objective and reliable.

Impact Study Based on 'Opinions' or 'Views'

An overview of some of the important impact studies would reveal serious lapses by the evaluators. For instance, in a study of impact of Applied Nutrition Programme "Opinions" / "Views" about the impact were used to study the impact itself. Basing on impact study almost entirely on 'views' and 'opinions', would be a very superficial assessment and there is likelihood of varied opinions and views on which inferring something specific would be absolutely impossible.

Cost Benefit Analysis

One special type of evaluation research is cost-benefit analysis. In this type of evaluation all one has to do is to add up the costs of a programme, subtract them from the value of benefits, and we get the results. Either benefit exceeds costs or vice-a-versa. On the surface it appears simple. But in practice it is one of the most difficult evaluation designs, as quantifying benefits in particular, is really a difficult

task.

This is more popular among policy makers and programme planners concerned about the cost involved and benefit accrued out of a programme. In the present context when every one asks about accountability, programme evaluation is probably here to stay.

Cost-benefit analysis is not as simple as it appears. Converting programme benefits into a monetary value is extremely difficult, particularly when a programme is intended to accrue long term benefits.

Cost Effective Analysis

Cost effective analysis is an alternative to cost benefit analysis because it is difficult to quantify the benefits. Instead, cost-effective analysis compares programme costs with programme effects measured in achievement test scores, skill performance level, coping abilities etc.

In the first stage of cost-effective analysis, the cost of the programme is determined. Going through the records of expenditures could do this. In the second stage, the programme effects are required to be quantified. The cost per beneficiary is calculated by dividing the total costs by number of beneficiaries. The cost thus obtained for each programme is calculated and compared to find out which programme is more effective.

Impact Study Designs

The focus of social impact analysis is to explain whether the programme has achieved its goal and if 'yes', then whether the analysis has to use experimental or quasi experimental designs of research involving serious quantitative measures. In an impact study programme/participants/beneficiaries will make up the experimental group, and their counterparts who don't receive benefits/participate in the programme, will make up the control group. In a social impact study, a programme is assessed to see what effect, if any is produced. Typically, the goals of the programme are identified and measured in terms of how well it achieves the goals (Monette *et. al.* , 1986).

Social Impact Analysis

A social development project is designed to produce significant effect in order to affect social structure and lead to social change and social transformation. This effect is commonly known as social impact.

Check Your Progress 5

1) Describe the various Alternative Evaluation Research Designs?

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2.4 ACTION RESEARCH DESIGNS

Action research are primarily for problem solving. Different types of research have been undertaken for this purpose. Most distinguishing feature of this type of research is their action plan which is designed, tried out and evaluated to assess exactly the extent of alleviation of the problem. Action research is commonly termed as applied research.

The methodological rigour of this kind of research is as important as for other type of research mentioned in the previous section. Action research deals with the application of research methods and skills in solving the social problems. In other words, action research is combination of research and practice. Therefore, while we undertake action research, we have to keep in mind the action plan, to resolve the problem under study.

What is Action Research?

Action research is one of the recent developments in the field of research. Understanding of the process of action research is of fundamental values for the community workers. Unlike other forms of social research, action research deliberately sets out to create change. Action research is a series of cycles that begin and end with research and incorporate planned action to bring change.

Action research has its roots in community development programmes. Modern action research brings together social research methodology and community organisation/development programmes together. Mc Taggart argues that this convergence has occurred because it has been demonstrated over and over again that research findings from one context do not necessarily work when applied to new contexts. Instead , ‘people must conduct substantive research themselves on the practices that affect their lives’(Mc Taggart 1997).

Thus, involvement of people, for whom the action research is conducted, is the key to action research. For this reason, perhaps, some authors prefer to call action research as ‘participatory action research’. This type of action research always contains the following :

- 1) The Researcher;
- 2) Involvement of individuals who are fundamental to the issue being researched; and
- 3) Focus on action to bring social change.

Action research intends to solve practical problems through research and planned actions. In this research, the emphasis is on solving problems through adoption of alternative practices suggested by a research study. The two distinct purposes of action research are : (a) to find out the causes of the problem, and (b) to suggest actions to resolve the problem.

Action research is applied research that treats knowledge as a form of power and abolishes the line between research and social action. There are several types of action research, but most share common characteristics, those who are being studied participate in the research process; research incorporates ordinary or popular knowledge; research focuses on power with a goal of empowerment; research seeks to raise consciousness or increase awareness; and research leading to political action.

Nature of Action Research

The ultimate object of action research is to solve the practical problems with the help of research techniques. Action research, then, like social research seeks to identify the exact nature and magnitude of the problem, analyse the causes in all their variety and intensity. Action research, however, assumes a distinct character of its own in a significant measure when it comes to the action to solve social problem. Action research emerges out of situational needs and a solution is also designed with respect to the situation.

Unlike other social research, action research is increasingly becoming a team work where researchers collaborate with practitioners and subjects/beneficiaries participate in the research process. Although the researcher takes the initiative and leads the team, action research is a team work wherein other partners: beneficiaries and other stake-holders have to put in conscious effort in the research process.

Action research is a self-evaluative process where the action research team evaluates the outcome of the exercise. Action research is initiated by practicing individual or group. Hence it becomes necessary for the researchers to understand the problem as it exists and develop the action research design.

Action research concerns with social data, which are much more complex than that of the physical data. The basis of all social interactions, whether it is a large complex group or a small cohesive group, is expectations of behaviour, which in turn is result of many factors. The complex nature of social data reduces the power of exact solution of the problem. Most of the subject matter of action research is qualitative and does not admit quantitative measurement. In action research, it is difficult to segregate the cause and effect. It is because many a time the cause is also the effect. This makes it very clear that the social data typically pose certain problems when it is analysed for taking action to solve social problems.

Objective of Action Research

The major objective of action research is to search for answers to questions raised while trying to resolve social problems. In other words, action research attempts to provide knowledge about what interventions or treatments can really help in resolving social problems. In addition, it also helps in searching for answers to problems or difficulties faced by practitioners in the practice of their profession.

Areas of Action Research

In a very broad sense, action research concerns itself with the problems faced by social activists/practitioners. It encompasses those questions which are encountered in working with people or in planning or administering social services which are capable of being solved through research and which are appropriate for social investigation.

Action research utilizes the same scientific methods and techniques, as does social research. No doubt, when some research designs/ procedures of social research are not suitable to action research, it would be necessary to develop the tools which would be appropriate to action research.

Check Your Progress 6

1) Describe the nature and objectives of action research.

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2.5 DIAGNOSTIC RESEARCH STUDIES

The diagnostic studies are concerned with discovering and analyzing the causes of a problem. It examines variables leading to diagnose the causes of problems. For example: Why girls are more interested in higher education than boys? To know the reason one needs to take up a diagnostic study. Another example could be a study to find out why people from low income group seem to be better adjusted to married life than those from higher income group? This means the focus of a diagnostic study is on the nature and causes of problem. These studies presuppose some prior knowledge of the problem, usually through a descriptive study. The example cited above may come up when we come to know through a descriptive study that comparatively more girls than boys are interested in higher education. Since main objectives of these studies are to diagnose the problem, it is necessary that specific variables under study are measured accurately. To determine the frequencies of significant variables and to find out whether certain variables are mutually related, in diagnostic studies, one has to define clearly what he wants to measure and must find adequate methods and techniques for its measurement. In addition, he must be able to specify who are to be included in the sample to be studied. In collecting data for these studies, what are needed are appropriate, valid and reliable techniques to measure the variables.

The procedures to be used in diagnostic studies must be carefully planned since the aim here is to diagnose the problem. The research design for these studies must make a much greater provision for protection against bias.

2.6 EXPLORATORY RESEARCH STUDIES

The purpose of exploratory studies is to formulate a problem for a more precise investigation or to develop hypotheses. However, an exploratory study can also be conducted to enhance the familiarity of researcher with the phenomena, he/she wishes to study some time later in a more scientific way.

For instance, if a researcher wanted to study social interaction patterns of AIDS/HIV patients but knew little or nothing about the phenomenon; an exploratory research would be appropriate. A preliminary interview with the relatives of AIDS/HIV patients would enable the researcher to develop a specific study design. Exploratory studies, therefore, help researchers to acquaint themselves with the characteristics of their research problem.

2.7 LET US SUM UP

Descriptive research describes what the condition is and involves the description, recording, analysis and interpretation of conditions that exist. We also studied various types of descriptive research, like survey, documentary analysis, correlational and causal comparative studies. Experimental research describes what will be when certain variables are carefully controlled or manipulated.

Correlational studies are concerned with determining the extent of relationship existing between variables. In a causal-comparative investigation, a researcher studies a real life situation which subjects have experienced.

Evaluation research is a systematic assessment of progress made by the implementing machinery; an analysis of problems and difficulties arising in the effective implementation of a programme, and an indication of the corrective measures necessary.

Any of the basic research designs, can be used for the purpose of evaluation research with some modifications. However, experimental designs are more appropriate for the purpose of evaluation research.

There are several alternative Evaluation Study Designs, namely: the Ex-Post-Facto Evaluation Study Design, Multiple Study Designs, Cost Benefit Analysis, Cost Effective Analysis and Impact Study Designs.

Action researches are undertaken to prepare action plan which is designed, tried out and evaluated to assess exactly the extent of alleviation of the problem.

The diagnostic studies are concerned with discovering and analyzing the causes of a problem. The purpose of exploratory studies is to formulate a problem for a more precise investigation or to develop hypotheses.

2.8 CHECK YOUR PROGRESS: THE KEY

Check Your Progress 1

Descriptive research studies are designed to study current status of a given phenomenon. They are concerned with the existing conditions or relationships, prevailing practices, current beliefs, points of view or attitudes, processes that are going on and their effects and the developing trends. In short, they investigate the

nature and magnitude of a situation as it exists at the time of study. The aim of descriptive research is to describe “what exists” with respect to variables or conditions in a situation.

Check Your Progress 2

Correlational studies are useful to:

- determine the relationship between variables and
- measure the extent to which variations in one variable are associated with the variations in another variable. The weaknesses of causal comparative studies are: lack of control, difficulty in identifying the relevant causal factors, determining their number in given phenomenon, classifying subjects into dichotomous groups for the purpose of comparison, lack of control over the selection of subjects.

Check Your Progress 3

Evaluation research is a systematic assessment and analysis of problems and difficulties arising in the effective implementation of a programme and an indication of the corrective measures necessary.

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UNIT 3 RESEARCH METHODS II: EXPERIMENTAL RESEARCH

Structure

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Experimental Research
- 3.3 Let Us Sum Up
- 3.4 Check Your Progress: The Key
- 3.5 Further Readings and References

3.0 OBJECTIVES

After the completion of this Unit, you should be able to:

- explain the characteristics and features of experimental research;
- describe the steps involved in experimental research; and
- identify and explain a few designs for experimental studies.

3.1 INTRODUCTION

As you studied in the previous Chapter, a ‘research method’ is a particular way of studying a problem. The features of the research problem and also the field of inquiry determine the ‘method’. In this Chapter we shall discuss Experimental Method of research in detail.

3.2 EXPERIMENTAL RESEARCH

Experimental research studies are designed for establishing causal relationships. This method begins with a question concerning the relationship between two or more variables. At the same time, the researcher advances one or more hypotheses stating the nature of the expected relationship. The experiment is the event planned and carried out by the researcher to gather evidence relevant to the hypotheses.

In its simplest form an experiment has three characteristics:

- i) an independent variable is manipulated,
- ii) all other variables except the independent variable are held constant, and
- iii) the effect of the manipulation of the independent variable on the dependent variable is observed.

The independent variable and the dependent variable(s) are important in an experiment. The independent variable is manipulated or changed by the experimenter. The variable upon which the effects of changes are observed is called the dependent variable, which is observed but not manipulated by the experimenter. The dependent variable is so named because its value is hypothesised to depend upon, and vary with, the value of the independent variable. For example, to examine the effect of

training upon decision making, an investigator would manipulate training, the independent variable, by using different training methods in order to ascertain their effect upon decision making, the dependent variable.

Introduction

Experimental research is designed for testing causal relationships. A causal relationship refers to relationships between two variables where one variable (characteristic or occurrence) X determines another variable (characteristic or occurrence) Y. For example, if a researcher wishes to test a causal relationship that punishments (X) cause low self-esteem (Y) by comparing a group of students who have been exposed to punishments (X) with one that has not been exposed, he has to measure the two groups with respect of Y, either during or after exposure to X.

Before discussing about the various types of experimental studies used for testing the causal relationship it is essential to know about the concept of 'causality'.

In the words of J.S. Mill (1930), "a cause which is itself a phenomenon without reference to the ultimate cause of any thing". Further he says, "causation is simply uniform antecedence. Though this explanation of the concept of 'cause' and 'causation' is more or less accepted by sciences including social sciences there are still ambiguities about the concepts specially when one thinks of a *first cause* and *subsequent cause* and a *final cause*. As a result, 'even in scientific' explanation, the different measures of the term 'cause' are frequently confused.

A cause may act by impelling or by releasing or by unwinding. Let us consider an example. In the game of snooker a ball is impelled to strike another ball which may in turn strike on number of balls. In this case, the first impulsion is the cause of movements of the second ball and the subsequent balls. The movements of second and subsequent balls are the effect of the cause induced by the impulsion. In other words, the event in question is shown to be determined by the preceding events.

In short, the investigation of preceding event (the cause) and successive events (the effects) caused by the preceding event constitutes causal relationships. Scientific research is mainly concerned with discovery of necessary and sufficient conditions for an effect. While common sense leads one to expect that one cause may provide a complete explanation for the effect the researcher rarely expects to find a single cause or condition that is both necessary and sufficient to bring about an effect. Rather, he is interested in finding out multiplicity of 'effects' or 'events'.

It is rather impossible, however, to demonstrate directly that a given variable 'X' either by itself or in conjunction with other variables, causes 'Y'. Hence, we prefer to infer from the data that the causal relationship (hypothesis) that 'X' is a cause for the occurrence of 'Y' is tenable only with some level of confidence.

The Logic of Causal Inference

To clarify the issues raised above, we have to understand the logic of causal inference. The three conditions that have to be fulfilled to draw a causal inference are:

- If
- 1) the cause precedes the effect in time,
 - 2) there is an empirical correlation between them, and
 - 3) the relationship is not found to be the result of the effects of some third 'variable on each of the two initially observed.

The first condition in a causal relationship is that the cause precedes the effect in time. For example, in the game of snooker the first impulsion is the cause of movements of the second ball and the subsequent balls. The movements of second and subsequent balls are the effect of the cause induced by the impulsion

The second condition in a causal relationship is that the two variables be empirically correlated with one another. For example, if a researcher wishes to examine if there is cause-effect relationship between gender and achievement, he or she has to use correlational technique to assess the magnitude of the relationship. It is also required that the coefficient of correlation is substantial.

The third condition for a causal relationship is that the observed empirical correlation between two variables cannot be explained away as being due to the influence of some third variable that causes both of them. For example, it may be observed that there is a strong correlation between 'knee joints pain' and 'amount of rainfall' but this does not mean that joints pain effect rainfall. A third variable, relative humidity is the cause of both knee joints pain and rainfall. Any relationship satisfying all these conditions is causal, and these are the only conditions of cause –effect relationship.

In a typical experimental study, two groups are chosen such that they do not differ significantly from each other except by chance. One of the groups is exposed to the independent variable (known as 'experimental group'). The two groups are then compared in terms of the effects. Research design, which involves comparison of two or more groups of subjects who have been exposed to an experiment, there is an underlying assumption that the groups being compared were similar before the introduction of experiment. To ensure this, the techniques such as 'randomization' or 'matching' are utilised. The technique of randomisation involves assignment of members of a group of subjects to experimental and control group. The procedure of assignment must give each member equal chance of being assigned to any of the groups. The technique of matching involves putting the subjects for assignment to the experimental or control group in a manner that a particular type of the experimental group is balanced by assigning his exact counterpart in the control group.

Validity of Causal Inference

While drawing causal inference we need to consider two forms of validity: internal validity and external validity.

Internal validity refers to the confidence we have that the causal inference from a study accurately explains whether one variable is a cause of another. If three conditions of causality are fulfilled it is said that the causal inference has internal validity. External validity refers to the extent to which the causal inference of a study can be generalised.

Threats to Internal Validity

Campbell and Stanley (1963) and Cook and Campbell (1971) have mentioned a number of threats to internal validity. Some of the important threats are discussed below:

- 1) *History* : The threat of history refers to events that occur during the course of an experiment. It is presumed that these events might have affected the dependent variable. History is a threat to an experiment which lasts longer and allows events to affect the dependent variable.

- 2) *Maturation* : As time passes, a number of changes occur within experimental subjects, such as, growing older, wiser, more experienced. These changes in the experimental subjects are called maturation changes. If any of these changes are found with dependent variable it could confuse the effect of independent variable.
- 3) *Testing* : Repeated testing often enhances the performance without any corresponding improvement in the variable under examination. For example, people taking intelligence test for a second time tend to score higher than they did the first time. The change in performance could lead to change in the dependent variable which in fact changes due to the repeated measure rather than the impact of the independent variable.
- 4) *Statistical Regression* : In the case of subjects scoring very high or very low the threat of statistical regression may arise any time. When those extreme cases re-measured will tend to score less extremely. In other words, they will tend to regress toward the average score.

Three Characteristics of Experimental Research

There are three essential ingredients in the conduct of an experiment: control, manipulation and observation. We shall discuss each of them as follows:

- i) **Control:** Control is the first essential ingredient of experimental method. Without control, it is impossible to evaluate unambiguously the effects of an independent variable. Basically, the experimental method rests upon two assumptions regarding variables. These are:
 - a) If two situations are equal in every respect except for a variable that is added to or deleted from one of the situations, any difference appearing between the two situations can be attributed to that variable. This statement is called the **law of the single variable**.
 - b) If two situations are not equal, and it can be demonstrated that none of the variables is significant in producing the phenomenon under investigation, or if significant variables are made equal, then any difference occurring between the two situations after the introduction of a new variable to one of them can be attributed to the new variable. This statement is called **the law of the only significant variable**.

The main purpose of ‘control’ in an experiment is to arrange a situation in which the effect of variables can be measured. The conditions to be fulfilled under the first law can be obtained more easily in physical sciences. A high degree of control is much easier to achieve in a laboratory setting than in situation outside the laboratory. In the laboratory, there is only limited number of variables which can be manipulated easily. However, as social research is concerned with human beings, there are always many variables present in situation. To attempt to reduce social problems to the operation of a single variable is not only unrealistic but perhaps impossible as well. Fortunately, we do not require such rigorous control to be introduced in social settings, for many factors involved in such a setting may be quite insignificant and irrelevant for our study. To this extent, in social research, the law of the single significant variable is more appropriate. For example, if we were to study the effect of two methods of teaching alphabets to two groups of adult learners, we are

likely to select the two groups which are identical in every respect except in the way they are taught alphabets. But it is impossible to have two groups that are identical in every respect. So, the endeavour of the researcher should be towards obtaining two groups that are as similar as possible, at least in those factors that are thought to have an effect on learning alphabets. These could be, general intelligence, motivation, reading ability, etc. Other variables that are not likely to affect achievement in learning alphabets can be ignored. Thus, in experimental studies in social research we need procedures that permit us to compare groups on the basis of significant variables. 'Control' is used to indicate an experimenter's 'procedures' for eliminating the differential effects of all variables extraneous to the purpose of the study. (An extraneous variable is variable that is not related to the purpose of the study but may affect the dependent variable). The experimenter exercises controls, for instances, when the groups are made comparable on extraneous variables that are related to the dependent variable. If a variable is known to be unrelated to the dependent variable, it cannot influence the dependent variable and we do not need to control it for its effects.

- ii) **Manipulation:** Manipulation of a variable is another distinguishing characteristic of experimental research. It refers to a deliberate operation performed by the researcher. In contrast to the descriptive research in which the researcher simply observes conditions as they occur naturally, the researcher in the experimental research actually sets the stage for the occurrence of the factors whose performance is to be studied under conditions where all other factors are controlled or eliminated. In social research and other behavioural sciences, the manipulation of a variable takes a characteristic form in which the experimenter imposes a pre-determined set of varied conditions on the subjects. This set of varied conditions is referred to as the independent variable; the experimental variable, or the treatment variable. Then, different conditions are designed to represent two or more values of the independent variable. These may be differences in degree or differences in kind. That is, the independent variable may have two or more values and the difference in the values may be of quantitative or qualitative nature. Methods of teaching, attitudes, socio-economic status, personality characteristics, types of motivation, etc. are some common examples of the independent variable in social research. For example, if the researcher compares two methods of teaching, then method of teaching is the independent variable and can be manipulated by the teacher. We may manipulate a single variable or a number of variables simultaneously.
- iii) **Observation:** In experimentation, we are interested in the effect of the manipulation of the independent variable on a dependent variable. Observations are made with respect to some characteristics of the behaviour of the subjects employed in the research. These observations which are quantitative in nature may constitute the dependent variable. This needs some explanation.

The dependent variable in social research is often changing of some type, such as attitude towards learning. We are often interested in explaining or predicting attitude. Since attitude cannot be measured directly, we can only estimate it through measures like scores in a scale. Therefore, strictly speaking, the dependent variable is scores or observations rather than change in attitude.

Check Your Progress 1

1) Explain briefly the significance of control, manipulation, and observation in an experimental study.

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Steps Involved in Experimental Research

A number of steps are involved in experimental research. Here, we shall talk about four steps to reach the stage of the ‘actual experiment’. Brief explanations are needed for steps 3 and 4 only. The steps are:

- i) Surveying the literature related to the problem,
- ii) Identifying and defining the problem,
- iii) Formulating hypotheses is an important step in experimental research. They suggest that an antecedent condition or phenomenon (independent variable) is related to the occurrence of another condition, phenomenon, event, or effect (dependent variable). To test a hypothesis, the experimenter attempts to control all the conditions except the independent variable which he/she manipulates. Then he/she observes the effect on the dependent variable presumably because of the exposure to the independent variable.
- iv) Constructing an experimental plan is the next step in experimental research. This refers to the conceptual framework within which the experiment is conducted. This would involve:
 - Selecting a research design,
 - Selecting a sample of subjects to represent a given population, assign subjects to groups, and assign experimental treatments to the groups. (Subject implies the respondent or living organism that is studied),
 - Selecting or constructing and validating instruments to measure the outcomes of the experiment,
 - Stating the procedures for collecting the data and possibly conduct a pilot or “trial run” test to perfect the instruments or design, and
 - Stating the statistical or null hypothesis.

The above steps bring the researcher to the stage when he/she actually conducts the experiment, applies statistical measures to the data obtained, and then test the significance of the results.

In the next sub-section, we shall take up the various designs involved in experimental method.

Designs of Experimental Study

A research design is very important for the researcher. A well developed design provides the structure and strategy to control the investigations and extract dependable answers to the questions raised by the problem or hypothesis. It is the nature of the problem that determines the appropriateness of the design.

Before we discuss the experimental designs, it will be relevant to look into the terms and symbols which we shall make use of.

- i) X represents the independent variable, which is manipulated by the researcher; it is also referred to as the experimental variable or the treatment variable.
- ii) Y represents the measure of the dependent variable. Y_1 represents the dependent variable before the manipulation of the independent variable X. It is usually a pre-test of some type administered before the experimental treatment. Y_2 represents the dependent variable after the manipulation of the independent variable X. It is usually a post-test administered to subjects after the experimental treatment.
- iii) S represents the *subject* or *respondent* used in the experiment.
- iv) E group refers to the *experimental group* – the group that is given the independent variable treatment.
- v) C group refers to the *control group* – the group that does not receive the experimental treatment.
- vi) R indicates *random assignment* of subjects to the experimental groups and the random assignment of treatments to the groups.

There are a large number of experimental designs. Various authors have classified experimental design into certain categories. Most common categorization comprises:

- Pre-experimental Design
- True Experimental Design
- Quasi Experimental Design

Some authors like Donald Ary and others (1985) have added more categories namely

- Factorial Design
- Time Series

Various designs under the above mentioned categories are given in the table below:

However, in this section, we will bring before you only a few most frequently used designs, from each of the five categories.

Pre-experimental Design

The two designs classified as pre-experimental designs offer minimal control of extraneous variables. Still they are used quite often in social research. These designs help to illustrate the advantages of more rigorously controlled designs that are presented later.

Design 1: One Group Pre-test Post-test Design

When this design is employed, the dependent variable is measured before the independent variable or treatment is applied or withdrawn, and then measured yet again. The one group design usually involves three steps:

- a) administering a pre-test measuring the dependent variable,
- b) applying the experimental treatment X to the subjects, and
- c) administering a post-test again measuring the dependent variable.

Differences attributed to application of experimental treatment are then determined by comparing the pre-test and post-test scores.

Pre-test	Independent variable	Post-test
Y_1	X	Y_2

Design 1: One Group Pre-test Post-test Design

To illustrate the use of this design, let us assume that we want to evaluate the effectiveness of a particular self-instructional material in Social work for post graduate students. How may we go about this task?

At the beginning of the academic year, the students are given a standardized test that measures the objectives of the course quite satisfactorily, following which the distance teacher then introduces the self-instructional material (SIM). At the end of the year, the students are administered the standardized test a second time. Comparing the scores of the two tests would reveal what difference the exposure to the SIM has made.

However, using only one group, as in Design 1, gives us superficial control. The major limitation of the one-group design is that, since no control group is used, the experimenter cannot assume that the change between the pre-test and the post-test scores is brought about by the experimental treatment alone. It is quite possible that some extraneous variables account for all or part of the change. For example, students experience changes with the passage of time; they grow mentally as well as physically, or they may acquire additional learning experiences that would affect the dependent variable. This extraneous variable can be thought of as **maturation** i.e., with the passage of time students get maturity and this in turn may affect achievement level. Another type of extraneous variable that can operate between the pre-test and the post-test scores and which cannot be controlled is **history**. History as a source of extraneous variances refers to the specific events that can occur between the pre-test and post-test other than the experimental treatment. In the example cited above, not receiving material regularly or illness just before the test, could decrease achievement scores. Similarly, a crucial research finding in history could increase widespread interest and hence affect the test scores. In fact, history and maturation become increasingly influential sources of extraneous variance when the time interval between Y_1 and Y_2 is long.

Another shortcoming of Design 1 is that it offers no way of assessing the effect of the pre-test Y_1 itself. We know that “practice effect” exists when subjects take a test a second time or take an alternate form of the test. In other words, subjects do better the second time even without any instruction or relevant discussion during the interval. This is true not only for achievement and intelligence tests but also for personality tests. In the case of personality tests, a tendency towards better adjustment is generally observed.

To sum up, Design 1 has little to recommend it; without a control group to make a comparison possible, the results obtained in a one group design are basically uninterpretable. The results of the experiment would have been dependable if there could be a comparable group i.e. control group to which SIM had not been given.

Design 2: Static Group Comparison

Design 2 utilizes two or more groups, only one of which is exposed to experimental treatment. The groups are assumed to be equivalent in all relevant aspects; they differ only in their exposure to X.

This design is often used in social research, For example, achievement of adult learners taught by a new method is compared with that of similar class taught by a traditional method.

Design 2 has a control group or groups, which permit (s) the comparison that is required for scientific respectability. If the experimental group is superior on the Y_2 measure, the researcher then has more confidence in his/her conclusion that the difference is due to experimental treatment.

However, there is a basic flaw in this design. Since neither **randomization** nor even **matching** is used to assign subjects to the experimental and control groups, we cannot be sure that the groups are equivalent prior to the experimental treatment. They may differ on certain relevant variables, and it may be these differences rather than X that are responsible for the observed change. Because we cannot be sure that the groups are equal with regard to all the factors that may influence the dependent variable, this design is considered to be lacking in the necessary control and must be classified as pre-experimental.

Group	Independent Variable	Post-test
E	X	Y_2
C	—	Y_2

Design 2: Static Group Comparison

True Experimental Designs

The following two designs belong to the ‘true experimental’ design, because of the control that they provide. i.e.

- i) Random assignment of subjects to the groups.
- ii) Random assignment of treatment to the groups.
- iii) Post-testing all the groups.

Design 3: Randomized Subjects, Post-test only Control Group Design

This particular design requires two groups to which subjects are randomly assigned and each group is assigned to a different condition. No pre-test is used; randomization controls all the possible extraneous variables. This does not mean that randomization procedures (like drawing names out of a hat, or flipping a coin) remove the extraneous variables, such as the IQ or age, which may affect the dependent variable, or control their presence. These extraneous variables still affect the inquiry; but, now, it is the laws of chance rather than the personal feature of E that operate. In fact, the larger the number of subjects used the more equivalent or similar the groups will tend to be. Suppose a researcher wants to study the effect of instructional material on achievement in a course during a contact programme. He/she may randomly assign the students to the groups and provide treatment to one of the groups. The assigning of the treatment will be random. At the end of the contact programme, he/she may test both the groups.

After the subjects are assigned to the groups, only the experimental group is exposed to the experimental treatment. Otherwise, in all other respects, the two groups remain similar. Members of both groups are then measured on dependent variable Y_2 . Scores are then compared to determine the effect of X.

Group	Independent Variable	Post-test
(R)E	X	Y_2
(R)C	—	Y_2

Design 3: Randomized Subjects, Post-test only Control Group Design

The main advantage of Design 3 is randomization, which assures statistical equivalence of the groups prior to the introduction of independent variable. Design 3 provides controls for the main effects of history, maturation and pre-testing; because no pre-test is used, there can be no interaction effect of pre-test and X (treatment).

Design 4: Randomized Matched Subjects, Post-test only Control Group Design

This design is similar to Design 3 except that it uses a matching technique, rather than random assignment, to obtain equivalent groups. Subjects are matched on one or more variables that can be measured conveniently, such as IQ or reading scores. The matching variables used are generally those that have a significant correlation with the dependent variable. On the basis of these variables subjects are paired so that opposite member's/scores' are as close as possible; and then, one member of each pair is randomly assigned to one treatment and the other to the second treatment.

Group	Independent Variable	Post-test
(M) E	X	Y_2
(M) C	—	Y_2

Design 4: Randomized Matched Subjects, Post-test only Control Group Design

Matching is most useful in studies where small samples are to be used and where Design 3 is not appropriate. Also, the matched subjects' design serves to reduce

the extent to which experimental differences can be accounted for by initial differences between groups. However, for matching to really become a means of control, the matching of all the potential subjects must be complete, and assignment of the members of each pair to the groups must be determined randomly. If one or more subjects should be excluded because an appropriate match could not be found, this would bias the sample. When using Design 4, it is essential to match every subject, even if only approximately, before random assignment is effected.

Quasi Experimental Design

One of the Quasi Experimental Designs is Non-randomized Control Group, Pre-test Post-test Design. You would notice that randomized control group pre-test post-test design is a true experimental design which we have presented before. The only difference on the quasi experimental design is that the groups are not randomized. Hence they are unlikely to be comparable. In fact, it is on this ground that the design becomes quasi experimental and not true experimental. Since the rest of the design related characteristics remain common with the randomized control group pre-test post-test design of the true experimental design category, we do not need to provide any further details on this design.

Group	Pretest	Independent Variable	Post-test
E	Y₁	X	Y₂
C	Y₁	–	Y₂

Factorial Designs

A factorial design is one where two or more variables are manipulated simultaneously in order to study the independent effect of each variable on the dependent variable as well as the effects due to interaction among the several variables. Factorial designs are of two types. In the first type, one of the independent variables may be experimentally manipulated. The researcher is primarily interested in the effect of a single independent variable but he/she must take other variables into consideration which may influence the dependent variables. In the second type of design, all the independent variables may be experimentally manipulated. Factorial designs have been developed at varying levels of complexity, the simplest factorial design is the 2 by 2 (2 × 2) Design. The two independent variables have two values.

Level 1 subject receives Treatment A and others Treatment B. Some level 2 subjects receive Treatment A and others Treatment B.

Attribute Variable X₂	Experimental Variable X₁	Variable X₂
	Treatment A	Treatment B
Level 1	Cell 1	Cell 3
Level 2	Cell 2	Cell 4

The strength of the factorial design is that it can achieve in one experiment what might otherwise require two or more separate studies.

Time Series Design

We have already discussed pre-test post-test designs. They generate one time data

on the dependent variable before and after the experimental treatment. There are instances where it becomes necessary to compare changes in the trend of a particular phenomenon or process or product. For example, let us assume that learners behaviour to attitudes, achievements etc. changes over a period of time. If a specific treatment is introduced in an institution to study the change in attitude or achievement, it is useful to study the trend through measurement at certain intervals before the introduction of the treatment. Instead of one time pre-test, the test is repeated three or four times before the treatment is administered. This generates data on the trend of behaviour. Similarly after the treatment is administered instead of one time post-test, the post-test is administered several times at intervals. This provides data to derive the trend in the change in behaviour. Since both pre-tests and post-tests are used over a time series design, the effect of the treatment on the dependent variable is tested by comparing the trends. This can be represented in the following form:

$Y_1 \quad Y_2 \quad Y_3 \quad Y_4 \quad Y \quad Y_5 \quad Y_6 \quad Y_7 \quad Y_8$

What we have described above is one group time series design. If you add a control group and repeat the same time series measurement without the treatment of the control groups, it becomes control group time series design. Similarly control group time series design is represented as:

Group

E $Y_1 \quad Y_2 \quad Y_3 \quad Y_4 \quad X \quad Y_5 \quad Y_6 \quad Y_7 \quad Y_8$

C $Y_1 \quad Y_2 \quad Y_3 \quad Y_4 \quad X \quad Y_5 \quad Y_6 \quad Y_7 \quad Y_8$

Check Your Progress 4

1) Draw and compare the figures representing pre-test and post-test experimental design and one group time series design.

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3.3 LET US SUM UP

In this Chapter, we studied two important research methods, viz., Descriptive Method and Experimental Method. Descriptive research describes what is the condition and involves the description, recording, analysis and interpretation of conditions that exist. We also studied various types of descriptive research, like survey, documentary

analysis, correlational and causal comparative studies. Experimental research describes what will be when certain variables are carefully controlled or manipulated.

3.4 CHECK YOUR PROGRESS: THE KEY

Check Your Progress 1

The steps involved in survey studies are: selecting the topic, sampling, selection/ construction of tools of data collection, collection of data, processing of the data and analysis and interpretation of data.

Documentary analysis can show us the existing conditions and practices of an institution and the importance of problems in an organisation.

Check Your Progress 2

1) Correlational studies are useful to:

- determine the relationship between variables and
- measure the extent to which variations in one variable are associated with the variations in another variable. The weaknesses of causal comparative studies are: lack of control, difficulty in identifying the relevant causal factors, determining their number in given phenomenon, classifying subjects into dichotomous groups for the purpose of comparison, lack of control over the selection of subjects.

Check Your Progress 3

Control is crucial to (i) evaluate unambiguously the effects of an independent variable and (ii) arrange a situation in which the effect of variables can be measured.

Manipulation controls or eliminates the irrelevant factors and arranges a situation in which only relevant factors can be studied.

Observations are made to study specific characteristics in the behaviour of the subjects employed in experimental research.

Check Your Progress 4

Pre-test Post-test Experimental Design

Group	Pre-test	Treatment	Post-test
E	Y_x	X	Y_2

One Group Time Series Design

Y_1	Y_2	Y_3	Y_4	Y	Y_5	Y_6	Y_7	Y_8
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Compared to one test each before and after the treatment in pre-test post-test experimental group design, tests are repeated at specified intervals in one group time series design. Whereas, time series designs compare the trends of change in the dependent variable, the pre-test post-test experimental design tests one time gain or change in the dependent variable.

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UNIT 4 RESEARCH METHODS III: QUALITATIVE RESEARCH

Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Qualitative Research
- 4.3 Participatory Research
- 4.4 Let Us Sum Up
- 4.5 Check Your Progress: The Key
- 4.6 Further Readings and References

4.0 OBJECTIVES

On the completion of this Unit, you should be able to:

- explain the meaning of Qualitative Research;
- list the steps taken in this type of research;
- explain the issues of trustworthiness and objectivity in qualitative studies;
- describe the characteristics of the ‘case study’ method of research;
- explain the various steps in the ‘case study’ method in social research; and
- describe participatory research methods.

4.1 INTRODUCTION

This Chapter is a continuation of our discussion on methods of social research that we introduced in earlier chapter. We take up Qualitative Method, Case study Method and Participatory Research Methods for discussion in this chapter. The term qualitative research denotes investigations concerning social phenomena conducted in natural settings. Mostly, qualitative inquiry is identified with the concept of field studies in the areas of Anthropology and Sociology. It has a unique position in the conduct of research in social sciences and has attracted social researchers relatively recently. If a researcher is interested in studying the problems related with development of rural community, he/she may use these methods to study the problems in their natural settings to find out actual problems that confront them.

Case Study can be defined as an intensive investigation concerned with pertinent aspects of a particular unit in a given situation. The unit of investigation may be an individual or a group of individuals, or a social institution, a community or a culture.

A case study conducted on individuals may be linked with the processes of growth and development of a child; the behaviour of gifted children, psychoanalysis of a problem child, role of a leader in specific social movements, etc.

Participatory research is conducted for depicting people’s existing situation by making maps and diagrams. We shall look into these methods in some detail in this Chapter.

4.2 QUALITATIVE RESEARCH

In qualitative research, a researcher takes into account the phenomenon as a whole and describes it as it exists. In some situation, it is difficult to analyse a phenomenon into various components or variables which can be measured in quantified terms. In such cases, the researcher takes into consideration the phenomenon as a whole and assumes that there is some quality in the phenomenon in its entirety. When the researcher attempts to retain the significant totality of a phenomenon while verifying propositions regarding it, he/she adopts qualitative research methods. This method of research describes the experiences of people in depth and permits the researcher to study and understand people in depth in their own perceptions. Qualitative research helps us to examine the nature of human behaviour and experience and social conditions. It also permits the researcher to study selected issues, cases or events in depth. While using this method the researcher seeks to capture what people have to say in their own words.

Qualitative Research follows an altogether distinct conceptual framework which takes into account the following factors.

- i) **Multiple Realities:** First, naturalists assume that there exist multiple realities in social situations which can be observed and researched. They are perceived by people differently and thus become different mental constructs for different people. In other words, realities are taken to be what people perceive them at a particular point of time. Since social situations keep on changing from time to time, the realities, too, keep on changing. Furthermore, since the realities are context-specific, they cannot be tangible in a generalised form.
- ii) **Meanings and Interpretations:** Naturalists emphasise study of meanings given to or interpretations made about objects, events and processes concerning social situations. To them, changes in terms of social and behavioural phenomena cannot be identified with the concept of physical movements but by external observation alone. An understanding of human behaviour or a social phenomenon involves understanding of how humans see what they are doing or participating in an activity.
- iii) **Generation of Knowledge:** Qualitative inquiry insists on generation of knowledge resulting from the interaction between the researcher and the respondents. The respondents answer the questions put by the inquirer in terms of their perception or the meanings they attach to their actions. Moreover, interactions take place between the researcher and his/her respondents to achieve maximum levels of responsiveness and insights concerning the problem under investigation.
- iv) **Generalisation:** As stated above, naturalists do not believe in the process of generalization as propounded by scientists. Naturalists argue that in the process of making generalization, a lot of meaningful information existing in individual units is undermined; hence, generalized knowledge does not represent real or complete knowledge. For them, the process of knowledge generation must take into account the differences or the real evidence existing in specific situations. That is why; they take into account extreme cases while collecting data.
- v) **Human Relations:** In the case of human relations several intrinsic factors, events and processes keep on influencing each other constantly. Therefore, it

is not possible to identify one-to-one cause and effect relationships in this case of qualitative studies. To naturalists, causality in social sciences cannot be demonstrated in the 'hard' sense as it is done in the case of physical sciences. Rather, only patterns of plausible influences can be inferred from social and behavioural studies.

- vi) **Value Systems:** Naturalists do not believe in value-free inquiry. They assume the influence of value systems in the identification of problems, selection of samples, use of tools for data collection, conditions in which data are gathered, and the possible interaction that take place between the researcher and the respondents. That is why naturalists stress that the researcher's bias cannot be ignored and it must be mentioned in research reports.

Procedural Uniqueness of Qualitative Research

From the procedural viewpoint, the following need to be highlighted.

- i) **Holistic approach:** Naturalists intend to develop a deeper understanding of a given situation in a holistic fashion. In other words, all possible information concerning all the significant dimensions of the situation under study is gathered with a view to portray the situations in their totality. For example, role of voluntary actions in social work cannot be studied in a partial fashion. It has to be studied in a holistic manner taking into account the composite influence of all the socio-economic and cultural factors.
- ii) **Insightful inquiry:** Naturalists emphasise insightful inquiry, where humans are treated as the sole means of data collection. Qualitative methods like participant observation, informal interviews and discussions, reading of relevant literature, and daily observation notes and diary writing are very often used for fieldwork. However, the use of quantitative techniques like test administration and survey are not totally ruled out in the process of data collection under this approach.
- iii) **No a priori theory:** A researcher goes to the field for data collection without having any *a priori* (pre-specific) theory in mind. Naturalists apprehend that an *a priori* assumption restricts the inquiry to those elements which may have been significant prior to developing an understanding of the situation. It blocks the process of holistic enquiry. The naturalist investigator develops theoretical propositions only after interacting with the field. However, it is pointed out by naturalists that there is no insistence on developing theories afresh in each and every inquiry. Experience-based concepts theories in relation to specific situations may act as preliminary guidelines for many qualitative investigations.
- iv) **No pre-specific design of study:** Prior to fieldwork, naturalists do not make explicit statements on the hypotheses and the conditions in which data are to be collected, analysed and interpreted. The researcher develops only a broad outline of the study in advance. As the inquiry progresses, appropriate design emerges in the field; hypotheses, mostly in the question form are developed therein; final decisions are taken about the sample respondents/situations during the field work; experiences gathered through personal insights, intuition, personal images and apprehensions are recast into appropriate procedures for analyses.
- v) **Qualitative setting:** As stated earlier, naturalists believe in conducting studies in realistic settings. To them, reality cannot be studied in fragmented and controlled situations. They intend to unfold what happens in realistic situations rather than studying what can happen in controlled situations.

Check Your Progress 1

- 1) List the six aspects of the conceptual framework of qualitative research. Also describe briefly the procedural uniqueness of the qualitative method.

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Qualitative Research: Main Steps

Different opinions have been expressed by naturalists about the procedural details of qualitative research studies. On the one hand, the radical naturalists believe in non-specification of the processes of conducting a study. They take field work as an almost mystical process which is non-teachable. Accordingly, an investigator can start his/her field work after learning about the relevant substantive theory or theories and reviewing the empirical results of some field studies related with it.

On the other hand, most experts recommend field work to be made as deliberative as possible, retaining the qualitative status of the study as a whole. This is to smoothen the process of the study. As stated by Erickson (1986), “Preconceptions and guiding questions can be developed beforehand. But the researcher should not presume to know at the very outset, where specifically the initial questions might lead next.” The steps can be organised in the following sequence.

- i) **Identification of broader questions of inquiry:** First, the researcher is supposed to specify the pertinent issues or questions related to social settings which can be resolved or answered through field study. The main focus of the researcher should be on the specific structure of occurrences rather than general character of any social phenomenon. The issues can be directly linked with improvement of social practices in specific situations. Questions can be raised not only to study the events or facts but also to identify the perspectives of the individuals involved in particular events or processes. As stated earlier, emphasis should be laid on identifying perceptions of individuals regarding their own decisions or contributions to the occurrence of events or processes.

The motto of the social researcher should be to understand the realities by identifying satisfactory patterns in the actions of individuals participating in social activities. For instance, in a social situations, broader questions can be raised, such as, if relationships between a community organiser and the community are fully interactional, how do people give clear feedback to

community organiser, or how do leaders influence community organiser or how do the community organiser and people create an atmosphere where most of the community people appear to utilise the programmes/services?

The above questions guide the preliminary field work and generate further questions in a given context in the course of inquiry. Besides identifying the broad framework of questions, we must prepare a general outline of the sample population to be contacted or situations to be observed in particular contexts, and draw a sketch of the types of instruments or techniques to be employed for data collection.

- ii) **Collection of the initial level data:** Once we identify the broad questions for the investigation, we may make deliberate attempts to identify a full range of variations in the social and the organisational arrangements related to the situations/problems under study. We may start the inquiry in a broader context of the situation before proceeding to investigate specific occurrences of events in a social set up like a rural/tribal community. For instance, prior to starting an in-depth inquiry of functioning of a social institution, we may gather evidence on external social surroundings where the institution operates. This may require us to do an extensive exercise of data collection. After this, we concentrate on indepth observations or interaction with the situation which is being studied.
- iii) **Procedures for the collection of data:** Data collection can be carried out in different phases through participant observation. You may be introduced as one of the internal members/participants of the social set-up under study. It may be possible that real participants of the system like community leaders, people and head of the community, or head of the social institution can act as observers for conducting the study. We can collect data through all the relevant and available sources and means such as:
 - a) study of available literature, records and documents, diaries, pictures, photographs;
 - b) interactions with the persons concerned with the programme under study, and
 - c) our direct observation of and experiences regarding the programmes/situations.

You, as a field worker, would make use of purposive sampling of significant situations or behaviours you want to study, as well as the persons you want to interact with. Flexible approaches are followed in the field to identify:

- a) the situations where participation can take place more intensely;
- b) the persons with whom intensive interaction is required, and
- c) the people with whom casual dialogue is needed.

As stated earlier, even though a broad framework of sampling is chalked out prior to data collection, the actual process of sampling takes place during field work.

- iv) **Devices of data collection:** You can use different devices for data collection, such as taking notes about an observed situation, using electronic appliances like audio recorders and video cameras, still photographs and collecting relevant documents and literature on the problem. Planned informal interviews/dialogues

with different groups of respondents can be conducted and their opinions and perceptions can be recorded either during the time of the interview or immediately after the interview. Daily diaries pertaining to the experiences of the field work also need to be maintained.

You have to maintain separate records regarding (a) what you observe in the situations, (b) perception of respondents about the problems/events, and (c) your own perceptions about the persons and their involvement in the issue or programme under study.

Since there is no hypothesis prior to data collection, data are not manipulated directly to test the hypotheses. However, through scrutiny of daily observation records and evidence gathered, you would identify the emerging themes and patterns, phrases, actions, action sequences, expressed thoughts, feelings, etc. This process helps you identify further the meaningful situations to be studied and also the way in which the complete information can be collected.

As we saw earlier, field work can be conducted in different rounds. At the end of the first round of intensive field work, you may analyse the data qualitatively, refine the previous questions, and arrive at new specific questions for further verification. This is the stage where you can generate certain context-specific hypotheses for minute observation.

Moreover, at this stage, your focus is on a more restrictive range of events within the setting, and you begin to look for possible connections or influences between the setting and its surrounding environment.

Again, you return to the field with pinpointed questions/hypotheses. Since the scope of inquiry is sharpened at this stage, in-depth interaction concerning the pinpointed questions takes place conveniently. It should be noted that in the final stages of field work, the focus becomes more and more specific along with the development of the working hypotheses.

- v) **Data analysis:** In qualitative studies, data are analysed descriptively. The synoptic views of descriptive data are referred for interpretation. More specifically, the frequency data are presented in two or three-way contingency tables indicating the patterns of behaviour. Occasionally, we use non-parametric statistical techniques (you will read about it in Block 4 Unit 3) like a chi-square test, Mann-Whitney two tailed tests or rank-order correlation techniques for the identification of certain patterns of relationships in the context of the specific situation under study.

A sound qualitative study follows a cyclic process of data collection, generation of hypotheses, examination of data, further generation and/or modification of hypotheses, further data collection and verification till specific research questions are identified and the patterns of refined relationships are arrived at. Moreover, the final level analysis of data can provide a ground for identification of specific suggestions for improvement of the system.

Let us do the following exercise before we proceed to highlight the issues and problems related to qualitative inquiry.

Check Your Progress 2

1) In the process of conducting qualitative research, what is the major focus of study, and how does a researcher conduct a qualitative research? Answer briefly in about 50 words.

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Issues Regarding Trustworthiness and Objectivity in Qualitative Studies

Trustworthiness of findings: There have been attacks on naturalists on the issue of the trustworthiness in their process of inquiry. It is said that qualitative approach may bring subjectivity into the inquiry, and the biases of the researcher may not produce authentic information for others. Moreover, because of subjective interaction, valid knowledge may not be generated. Naturalists have reacted to these objections with force and conviction.

In the recent past, there have been efforts to fix certain standards to check the trustworthiness of qualitative inquiry. The criteria are outlined as follows:

- i) **Credibility** pertains to the level of agreement between researchers' data and the interpretations, and the multiple realities that exist in the minds of respondents.
- ii) **Transferability** is the quality that makes it possible to derive the accurate meaning of information on interpretation available in specific contexts.
- iii) **Dependability** is essentially the stability of information sought and interpretation derived in different situations on a specific issue.
- iv) **Confirmability** refers to the possibility of studying the collected objective/systematic information and reaching similar/same conclusions by different researchers.

The qualitative approach is guided by the following principles to enhance the credibility, transferability, dependability and confirmability of the studies they lead to:

- a) Prolonged field work can enable one to overcome a variety of possible biases and wrong perceptions, which may appear in one short trip. Moreover, it can help us to identify the salient characteristics of the problem/programme under study.

- b) Persistent observation of certain typical meaningful features can increase the credibility of the study.
- c) Interaction with colleagues helps us evolve suitable designs, share the researcher's anxieties, apprehensions and feelings concerning field work and share with them the growing insights in the field.
- d) A variety of data-sources using different investigators with different perspectives can project a consolidated picture of the field easily and can enhance the dependability and confirmability of the data.
- e) Study of the varieties of adequate reference materials like documents, pictures, films, videotapes and audio recordings are essential for increasing trustworthiness of data.
- f) Cross-checking of data and interpretations by some of the respondents can enhance internal validity of the study.
- g) Increasing purposive sampling to collect different instances across a wide range of events can be useful in maximising the range of information and increasing external validity of information.
- h) Substantive description of events in specific contexts can be useful in establishing the reliability and dependability of information and conclusion.

Although the above checks are followed in qualitative inquiry, there is no guarantee for the trustworthiness of a study. However, such checks can generate a convincing situation regarding the meaningfulness of the study. Unlike a long history of scientific inquiry which has established clear-cut standards for its trustworthiness, qualitative inquiry has a very recent origin, and is yet to evolve suitable checks to enhance its trustworthiness and authenticity.

Problems of observation: The strength of qualitative inquiry lies more in the competence of the field worker than the tools, techniques, and designs of data collection. There are several issues pertaining to the experience and expertise of the field worker, such as his/her relationship with the group being studied, the ethics involved in the processes of intensive data collection etc. We shall now touch upon some of these issues briefly as follows:

- a) First, it is necessary that only a researcher with a clear understanding of the problem should take up the task of conducting a qualitative study. Since the meaningfulness of the conduct of the study depends entirely on the human factor, it is very important to see 'who' conducts the study and 'how' he/she proceeds with the study.
- b) There have been some problems in situations in which an outside researcher acts as a participant observer. In such cases, there is an apprehension that a stranger who is accepted as an observer may be deliberately informed and invited to observe just because he/she is a stranger. Strangers may notice events that contrast with their expectations. They may affect the behaviour of the group through their influence while assessing this group. The personality traits of the observers and the situations to be studied are the major factors in developing a close affinity between the scholar and the field and making him/her comfortable with the situations.

- c) The inside observer, i.e., a person from within the institution studied who now acts as an observer, may face major problems in the process of data collection. The group member who acts as an observer may confuse his/her role as an observer with that of a group member. He/she may get a biased picture about his/her group or the institution because of his/her personal/emotional involvement with the group. Then, there are ethical constraints too; they chiefly pertain to the confidentiality required within the group. For example, he/she may be denied access to certain situations or documents because he/she is one of the members of the group.

To sum up, the investigator needs a great deal of self-awareness and a thorough understanding of the group processes to make the process of qualitative inquiry meaningful.

Check Your Progress 3

- 1) State briefly, what measures you have to follow to ensure authenticity of data in qualitative studies.

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- 2) What kinds of problem do you anticipate if you are to act a) as an internal observer to observe some of the activities of the institution where you work, and (b) to observe the activities of an outside institution as a participant observer?

Situation a)

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Situation b)

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Case Study Method

Case studies of social institutions may include the study of different individual units like the family, a cultural organisation, a social institution, a class or a developmental programme. In the case of studies on communities, a village, a tribe, a slum area or a culture, each can be considered a unit of investigation.

Whatever the unit of a case study, it is treated as a whole in the context of specific situations. The wholeness is determined through an abstraction of ideas. In one case, an individual's specific behaviour may be perceived as a totality; in another case, a situation consisting of group activities may be treated as a whole. Especially, in social situations, the units under investigation could be a whole developmental programme, a micro-credit system, instructional development in a group setting or in an 'individual setting', allowing the possibility of using a single method or integration of a number of methods.

Purposes of Case Studies

Usually, case studies are conducted for developing a deeper understanding about intricate relationships existing in the processual aspects of specific unit/units through qualitative investigations. In this context, the case study method is not very different from the approaches of naturalists. So, many a time, the case study method is treated as a kind of qualitative inquiry. For example, the functional aspects of any normal or exceptional institution may be the focus of a case study or any other approach used by the naturalists.

Case studies are conducted with a clinical purpose. They are treated as diagnostic and prognostic measures for clients' treatment. This approach has a psychotherapeutic background. In social research, case studies are conducted for resolving different problems and bringing about improvement in institutions facing such problems.

There can be case studies of biographical type, that aim at giving an account of an individual or tracing the development of an institution or a developmental programme through longitudinal and prolonged investigation.

Characteristics of Case Study Method

The procedural aspects of a full-fledged case study display certain specific characteristics, viz., continuity in investigation, completeness, authenticity of data, confidential recording and intellectual synthesis. We shall explain each one of them briefly as follows:

- i) **Continuity in investigation:** Continuous and prolonged enquiry about the situations is necessary till the underlying factors are explored and plausible patterns of their interaction/relationship identified. For example, the problems underlying the communal harmony cannot be explored in one go. A researcher may have to undertake prolonged inquiries.
- ii) **Completeness:** A sound case study involves extensive collection of data concerning internal as well as external environment of the unit under study. Data collection continues till the completeness of data is ensured and a complete picture of the unit emerges.
- iii) **Authenticity of data:** A report of the case study must be based on meaningful,

reliable and valid information regarding the case. Several qualitative and quantitative techniques such as interviews, participant observations, record surveys and administration of test questionnaires find their appropriate application in case studies. Use of multi-techniques approach to data collection and cross-examination of data through different techniques can take care of the authenticity of data. Moreover, since the researcher interacts with the typical situations personally, most of the ethical issues regarding the nature of data, the sample situations or sample respondents, the nature of interactions etc., emerge during the investigation. These issues need to be dealt with care to make the case study ethically meaningful.

- iv) **Confidential recording:** The necessary data, involving personal and ethical issues like relationships of teachers and pupils with the management, discipline, confidential records, documents about the institution etc., must be handled tactfully and every care must be taken to maintain their confidentiality.
- v) **Intellectual synthesis:** Since a case study involves multi-method inquiry and deals with all significant situations concerning the unit, appropriate synthesis of the data is necessary to depict the uniqueness of the unit and to explore significant relationships. A skilled investigator with theoretical sophistication, insightfulness and writing skills can do justice and prepare a sound case study.

Case Study: Main Steps

Most researchers treat case study method as one of the forms of qualitative inquiry. Therefore, the case study method follows the same steps as are followed in the case of qualitative inquiry. However, the following steps are considered to be very significant.

- i) **Selection of a case for investigation:** The first step in any case study is the identification and selection of a case for investigation. It mostly depends on the basic questions of researcher, such as: Am I interested in the study of a normal situation with a view to develop deeper insight about the phenomenon? Or, am I determined to solve the problems of a typical institution? Or, am I assigned the job of evaluating the functioning of an institution? Or, am I interested in identifying the underlying factors contributing to the excellent performance of an institution? Once the case is identified, then one needs to determine the status of the case. For this, several pieces of preliminary information are collected about the background of the case through the already available sources. At this stage, the initial exercise in setting the course of research is accomplished; it comprises, the following:
 - Demarcation of the relevant aspects of the case to be investigated;
 - Preparation of a broad outline of the study of sample situations, and
 - Preparation of the appropriate tools for collecting the ‘benchmark’ data about all the pertinent aspects of the case under study.

Answers to the questions would tell us whether we have identified the ‘case’ or not.

- ii) **Data collection:** Now, we move on to the stage of data collection. In the process of collecting benchmark data about the case, we may make use of both qualitative as well as quantitative techniques like observations, interviews,

checklists, proforma, open-ended questionnaires, record surveys, psychological tests, etc. Every care must be taken to use the tools specifically relevant for the case. In most cases, the first round exploratory work is done through personal interaction with the situation under study.

- iii) **Analysis of first round data:** Through systematic analysis of the first round data, we can identify the more complicated situations or problems, and raise pertinent questions about the influential factors. In the case of clinical investigations, we can state various hypotheses about the solutions to the problems.
- iv) **Second round investigation:** The second round investigation is conducted for only those specific questions or factors which are identified through the analysis of the first round data. Intensive investigations about these specific issues/problems are conducted through prolonged observations, informal and formal interviews, questionnaires, cross-examination of different documents and records, administration of specific tests etc. At the end of this second round of data collection, analysis and interpretation of data begins. However, during the interpretation of the data, if some more evidence is needed we may go for another round of data collection. Actually, in a case study, the process of data collection, its analysis and interpretation go on in cyclical order till satisfactory answers to the questions arising in the course of investigation are found and a clear cut picture of the case emerges through investigation. Most case studies aiming at understanding the dynamics of an educational/social unit stop at this stage.
- v) **Follow-up:** Investigations should be made regarding the effectiveness of the alternative measures introduced. Such investigations give us feedback on the strengths and weaknesses of the corrective measures. If we find them to be less effective, we should conduct further studies to arrive at some 'newer' remedial measures and apply them to the case.

Check Your Progress 4

- 1) Suppose you select Indira Gandhi National Open University for your case study or any other Institution from your state/district. Specify the broader components of the unit to be studied and list the different techniques to be used for data collection.

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Scientific Nature of Case Study Method

There have been criticisms against the case study method for lack of scientific approach. One criticism is that the case study method is useful in the exploration of knowledge related to a single unit, but it does not have scope to test hypotheses or confirm any evidence.

However, this limitation of the case study method cannot undermine its meaningfulness in the process of generating knowledge. Even though the case study method is viewed as a kind of qualitative inquiry, this method does accommodate the process of hypothesizing, though in a manner different from that of the survey and the experimental method.

- i) **Generating hypothesis in the case study method:** Hypotheses in the case study method are generally found in the form of questions or statements related to the various aspects of the given aspects of the educational process which are tested or confirmed more qualitatively in the given context of investigation. As stated earlier, while conducting a preliminary study on the unit, we may start with certain broad questions since we have limited experience of the case. Further, in the process of interaction with different educational situations, several statements may be generated for further verifications.

For instance, in an investigation of the classroom dynamics of an instructional system taken as a case, we may start with broad questions such as: what is the interactional pattern in the class; and “how is it related to students’ achievement?” While observing the interactional pattern you may witness a very high degree of cohesiveness among the group members and this could induce you to think further regarding the factors related to the cohesiveness in the specific case leading to further questions.

- ii) **Testing hypotheses in the case study method:** Testing hypotheses in case studies generally follows the qualitative approach, viz., the researcher’s insight into and impressionistic views about the process under investigation. However, the data processed in quantitative terms can be integrated with qualitative treatment for developing a holistic perspective regarding the case.
- iii) **Generalization of case study findings:** Contributions of the case study method to the process of evidence-generalization depends on several considerations, viz., the nature of the case under study, the theoretical framework generated, and the extent of objectivity possible. An investigator approaching a case would primarily have the purpose of understanding that particular case in its entirety and, hence, he/she may not be concerned with extending his/her understanding to other cases. However, such an understanding may take the form of further hypotheses which could be tested through other investigations.

There are possibilities of considering the findings of a case which may be significantly similar to another case studied at a later stage. There are situations where studies of different cases can be useful in developing a new trend. For example, Piaget’s intensive studies on selective children have generated respectable generalization, but more generalizations may be possible from the findings of a large number of case studies, provided the researchers concerned come from similar background and have similar experiences, ideological commitments and interest in certain issues. Although the contribution of the case study to the generalization of findings seems to be neglected, its potential in contributing to theorisation cannot be ignored by any insightful researcher.

The issues concerning the objectivity and trustworthiness of the case study method are similar to those of the qualitative method already discussed in the preceding section.

Check Your Progress 5

- 1) Explain briefly in about 50 words the contribution of a case study to the process of generating hypotheses and theories.

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4.3 PARTICIPATORY RESEARCH

Usually, participatory research is conducted by people for depicting their existing situation by making maps and diagrams and coming out with plans to change their situations and by analyzing the same. This method provides an opportunity to articulate their problems and to indicate what could be done to ameliorate their conditions.

A number of participatory approaches with different terminologies have since come into practice over a period of time. Rapid Rural Appraisal (RRA) was first to come. This term was then used to denote Relaxed Rural Appraisal. It later evolved into Participatory Rural Appraisal (PRA). Subsequently, a section of development professionals preferred to call it Participatory Learning and Action (PLA). Though, all these terms are commonly used for participatory approaches.

The term Participatory Rural Appraisal (PRA) was initially used to appraise existing situations only in rural areas. Later, it has also been used in urban areas and in other fields like adult education, policy influencing and advocacy, and organisation development. In addition, it has been used not only for appraisal but also for various other purposes. As such, the term Participatory Learning and Action (PLA) seems more comprehensive and suitable.

The basic presumption of participatory approaches has been that the poor and marginalized people are capable of analyzing their own realities and those they should be enabled to do so. Hence, its focus is on how people generate their own realities and how they reflect upon them so as to bring about changes in their situations.

The process of Participatory Rural Appraisal (PRA) employs varieties of techniques. Some of the commonly used techniques are meetings, group discussions, socio-

drama, and sharing of knowledge generated through various forms of folk, oral, written, and visual arts.

Check Your Progress 6

1) Explain briefly in about 50 words th concept of Participatory Research.

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Participatory Rural Appraisal Methods

A wide range of Participatory Rural Appraisal methods are in use today. These methods can be broadly classified as space, time, and relationship methods.

Space Related PRA Methods

Space related PRA methods are useful for the spatial dimension of people’s reality. These methods include social mapping and the focus is on how people perceive and relate to space rather than just to the physical aspects, as they exist. The other common space-related methods are the resource map, participatory modelling, mobility map, services and opportunities map and transect, mobility map.

The social map is used to describe the habitation pattern while the resource map is focussed on the natural resources. Participatory modelling is three-dimensional description of an area. Mobility map is used to depict and analyse the mobility patterns of the local people while services and opportunities maps help in presentation of the availability of various services and opportunities in the locality. Transect presents a cross-section of an area and is particularly useful in natural resources managements.

Time Related PRA Methods

This is used to explore temporal dimensions of people’s realities. The uniqueness of this method is that it allows people to use their own concept of time. This method includes time-line, trend analyses, historical transect, seasonal diagram, daily activity schedule, participatory genealogy and dream map.

Time-line depicts an aggregate of the various landmark events as perceived by the local people. Trend analysis focuses on changes that have taken place across certain time landmarks. Historical transect, ‘then and now’ and ‘past, present and future’ methods are *variants* of trend analysis. Seasonal diagrams show the change

in people's lives across the annual cycle and across sessions or months. Daily activity schedule shows how the people spend their day from the time they get up till they go to bed. The participatory genealogy helps pinpointing the various generations, descent and the changes that have taken place over the generations. Dream maps are prepared to show the future vision and aspirations of people.

Relationship Methods

Relationship methods include flow diagrams like cause-effect diagrams, impact diagrams, system diagrams, network diagrams and process maps. It also includes well-being ranking method, Venn diagrams, pair-wise ranking, matrix scoring/ranking, force field analysis, pie diagrams, livelihood analysis, spider diagrams and body mapping. The main purpose of this method is to study the relationships between various items or various aspects of the same item.

Check Your Progress 7

1) Explain briefly the three methods of Participatory Research.

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4.4 LET US SUM UP

In this Chapter, we have discussed Qualitative and Case Study methods of research. We have focussed on the meaning and significance of these methods, their uses in the educational field, steps in conducting studies in each method and problems and issues raised about them.

- With regard to generating knowledge in context specific situations, qualitative inquiry makes unique contributions in the field of research in social sciences. It uses the researcher's impressionistic views as the main source of knowledge.
- Case study method can be treated as a kind of qualitative inquiry since this method also aims at developing deeper understanding about a case; an institution, a programme or an individual in ways not very different from those used in qualitative inquiry. A well-organised case study can generate meaningful hypotheses for further research through prolonged interaction with the case use of multi-method investigations and cross-examination of data.

- Participatory research is conducted by people for depicting their existing situation by making maps and diagrams and coming out with plans to change their situations and by analyzing the same. This method provides an opportunity to articulate their problems and to indicate what could be done to ameliorate their conditions.
- Participatory Rural Appraisal methods are : space related methods, time related methods, and relationship methods.

4.5 CHECK YOUR PROGRESS: THE KEY

Check Your Progress 1

The six aspects of the conceptual framework of qualitative inquiry are: i) multiple realities, (ii) meanings and interpretations, (iii) generation of knowledge, (iv) generalisation, (v) human relations and (vi) value systems.

The uniqueness of qualitative method is to be seen in its holistic approach - insightful inquiry and its opposition to *a priori* theories and pre-specific design of study.

Check Your Progress 2

The major focus of qualitative inquiry is an understanding of the interrelationships of influential factor in a time and context that would reveal the nature of specific and concrete reality. Qualitative inquiry requires the researcher to interact with the field through participant observation, formulate specific questions in the course of such interaction and continue the inquiry in the field till a clear pattern of relationships is identified and the real nature of events understood.

Check Your Progress 3

- i) Continuous and prolonged field work, interaction with colleagues, variety of the sources of data and use of multi-methods/techniques, cross checking of data, increasing sample situations and substantive description of data can enhance the authenticity of data in qualitative studies.
- ii)
 - a) Ethical problems, emotional attachment with the field and lack of seriousness in participants' responses.
 - b) Exaggeration of facts by respondents, and influence of prejudices/biases in assessing the group situations.

Check Your Progress 4

The following could be the components: the courses offered, students, process of course development, distribution of courses, student support services, evaluation processes, and management of physical and human resources. In this

case, both qualitative and quantitative techniques such as, record surveys, interviews, observations, questionnaire-based surveys and achievement tests could be used to collect data.

Check Your Progress 5

Interaction with situations and analysis of first round data may lead to the identification of questions of causal type. Findings of case studies may be used as

hypotheses for further studies, and also extended to cases of similar nature. Generalisations could be made on the basis of the findings from a number of cases studied in a broader context.

Check Your Progress 6

Participatory research is conducted by people for depicting their existing situation by making maps and diagrams and coming out with plans to change their situations and by analyzing the same. This method provides an opportunity to articulate their problems and to indicate what could be done to* ameliorate their conditions.

Check Your Progress 7

Participatory Rural Appraisal methods are: space related methods, time related methods, and relationship methods.

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