

B.A PROGRAM
IV SEM
RESEARCH METHODOLOGY
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The Research Design

What research design means

The important functions of research design

Issues to consider when designing your own research

The theory of causality and the research design

What is a research design?

traditional research design is a blueprint or detailed plan for how a research study is to be completed—operationalizing variables so they can be measured, selecting a sample of interest to study, collecting data to be used as a basis for testing hypotheses, and analysing the results.

The theory of causality and the research design

Now let's turn to the second function of the research design – ensuring that the procedures undertaken are adequate to obtain valid, objective and accurate answers to the research questions. To ensure this, it is important that you select a study design that helps you to isolate,

eliminate or quantify the effects of different sets of variable influencing the independent variable. To help explain this, we look at a few examples.

Suppose you want to find out the effectiveness of a marriage counselling service provided by an agency – that is, the extent to which the service has been able to resolve the marital problems of its clients. In studying such relationships you must understand that in real life there are many outside factors that can influence the outcome of your intervention. For example, during visits to your agency for counselling, your client may get a better job. If some of the marital problems came about because of economic hardship, and if the problem of money is now solved, it may be a factor in reducing the marital problems. On the other hand, if a client loses his/her job, the increase in the economic problems may either intensify or lessen the marital problems; that is, for some couples a perceived financial threat may increase marital problems, whereas, for others, it may create more closeness between partners. In some situations, an improvement in a marriage may have very little to do with the counselling received, coming about almost entirely because of a change in economic circumstances. Other events such as the birth of a child to a couple or a couple's independent 'self-realisation', independently arrived at, may also affect the extent and nature of marital problems.

research design serves two important functions: (1) to detail the procedures for undertaking a study; and (2) to ensure that, in the case of causality, the independent variable has the maximum opportunity to have its effect on the dependent variable while the effect of extraneous and chance variables is minimised. In terms of the first function, a research design should outline the logistical details of the whole process of the research journey. You need to spell out in detail what type of study design per se you are proposing to use and why, who are going to be your respondents and how they will be selected, from how many you are proposing to get the needed information, how the information will be collected by you and how you are going to analyse the information. For each aspect you need to provide your rationale and justification and as far as possible support them from the literature reviewed.

Through the second function, 'Control of variance', when establishing association or causality, it ensures your supervisor and readers that you have set up your study in such a way that your independent variable has the maximum chance of affecting the dependent variable and that

the effects of extraneous and chance variables are minimised, quantified and/or controlled (the 'maximincon' principle of variance). A study without a control group measures the total change (change attributable to independent variable \pm extraneous variables \pm chance variables) in a phenomenon or situation. The purpose of introducing a control group is to quantify the impact of extraneous and chance variables.

The study design is a part of the research design. It is the design of the study per se, whereas the research design also includes other details related to the carrying out of the study.

Selecting a Study Design

The differences between quantitative and qualitative study designs
Common study designs in quantitative research and when to use them
Common study design in qualitative research and when to use them
The strengths and weaknesses of different study designs

Differences between quantitative and qualitative study designs

study design. The main focus in qualitative research is to understand, explain, explore, discover and clarify situations, feelings, perceptions, attitudes, values, beliefs and experiences of a group of people. The study designs are therefore often based on deductive rather than inductive logic, are flexible and emergent in nature, and are often non-linear and non-sequential in their operationalisation. The study designs mainly entail the selection of people from whom the information, through an open frame of enquiry, is explored and gathered. The parameters of the scope of a study, and

information gathering methods and processes, are often flexible and evolving; hence, most qualitative designs are not as structured and sequential as quantitative ones. On the other hand, in quantitative research, the measurement and classification requirements of the information that is gathered demand that study designs are more structured, rigid, fixed and predetermined in their use to ensure accuracy in measurement and classification.

In qualitative studies the distinction between study designs and methods of data collection is far less clear. Quantitative study designs have more clarity and distinction between designs and methods of data collection. In qualitative research there is an overlap between the two. Some designs are basically methods of data collection. For example, in-depth interviewing is a design as well as a method of data collection and so are oral history and participant observation.

One of the most distinguishing features of qualitative research is the adherence to the concept of respondent concordance whereby you as a researcher make every effort to seek agreement of your respondents with your interpretation, presentation of the situations, experiences, perceptions and conclusions. In quantitative research respondent concordance does not occupy an important place. Sometimes it is assumed to be achieved by circulating or sharing the findings with those who participated in the study.

The 'power-gap' between the researcher and the study population in qualitative research is far smaller than in quantitative research because of the informality in structure and situation in which data is collected. In quantitative research enough detail about a study design is provided for it to be replicated for verification and reassurance. In qualitative research little attention is paid to study designs or the other structural aspects of a study, hence the replication of a study design becomes almost impossible. This leads to the inability of the designs to produce findings that can be replicated. Findings through quantitative study

designs can be replicated and retested whereas this cannot be easily done by using qualitative study designs.

Study designs based on the number of contacts

Based on the number of contacts with the study population, designs can be classified into three groups:

1. cross-sectional studies; 2. before-and-after studies; 3. longitudinal studies.

FIGURE 8.1 Types of study design

The cross-sectional study design
Cross-sectional studies, also known as one-shot or status studies, are the most commonly used design in the social sciences. This design is best suited to studies aimed at finding out the prevalence of a phenomenon, situation, problem, attitude or issue, by taking a cross-section of the population. They are useful in obtaining an overall 'picture' as it stands at the time of the study. They are 'designed to study some phenomenon by taking a cross-section of it at one time' (Babbie 1989: 89). Such studies are cross-sectional with regard to both the study population and the time of investigation.

A cross-sectional study is extremely simple in design. You decide what you want to find out about, identify the study population, select a sample (if you need to) and contact your respondents to find out the required information. For example, a cross-sectional design would be the most appropriate for a study of the following topics:

The attitude of the study population towards uranium mining in Australia.

The socioeconomic–demographic characteristics of immigrants in Western Australia. The incidence of HIV-positive cases in Australia.

The reasons for homelessness among young people.

The quality assurance of a service provided by an organisation.

The impact of unemployment on street crime (this could also be a before-and-after study). The relationship between the home environment and the academic performance of a child at school.

The attitude of the community towards equity issues.

The extent of unemployment in a city.
Consumer satisfaction with a product.
The effectiveness of random breath testing in preventing road accidents (this could also be a before-and-after study).
The health needs of a community.
The attitudes of students towards the facilities available in their library.
As these studies involve only one contact with the study population, they are comparatively cheap to undertake and easy to analyse. However, their biggest disadvantage is that they cannot measure change. To measure change it is necessary to have at least two data collection points – that is, at least two cross-sectional studies, at two points in time, on the same population.

The before-and-after study design

A before-and-after study is carried out by adopting the same process as a cross-sectional study except that it comprises two cross-sectional data sets, the second being undertaken after a certain period. Depending upon how it is set up, a before-and-after study may be either an experiment or a non-experiment. It is one of the most commonly used designs in evaluation studies. The difference between the two sets of data collection points with respect to the dependent variable is considered to be the impact of the programme. The following are examples of topics that can be studied using this design:

The impact of administrative restructuring on the quality of services provided by an organisation. The effectiveness of a marriage counselling service.

The impact of sex education on sexual behaviour among schoolchildren.

The effect of a drug awareness programme on the knowledge about, and use of, drugs among young people.

The impact of incentives on the productivity of employees in an organisation. The impact of increased funding on the quality of teaching in universities. The impact of maternal and child health services on the infant mortality rate. The effect of random breath testing on road accidents.

The effect of an advertisement on the sale of a product.

The longitudinal study design

The before-and-after study design is appropriate for measuring the extent of change in a phenomenon, situation, problem, attitude, and so on, but is less helpful for studying the pattern of change. To determine the pattern of change in relation to time, a longitudinal design is used; for example, when you wish to study the proportion of people adopting a programme over a period. Longitudinal studies are also useful when you need to collect factual information on a continuing basis. You may want to ascertain the trends in the demand for labour, immigration, changes in the incidence of a disease or in the mortality, morbidity and fertility patterns of a population.

Study designs based on the nature of the investigation

On the basis of the nature of the investigation, study designs in quantitative research can be classified as:

experimental; non-experimental;
quasi- or semi-experimental.

To understand the differences, let us consider some examples. Suppose you want to test the following: the impact of a particular teaching method on the level of comprehension of students; the effectiveness of a programme such as random breath testing on the level of road accidents; or the usefulness of a drug such as azidothymidine (AZT) in treating people who are HIV-positive; or imagine any similar situation in your own academic or professional field. In such situations there is assumed to be a cause-and-effect relationship. There are two ways of studying this relationship. The first involves the researcher (or someone else) introducing the intervention that is assumed to be the 'cause' of change, and waiting until it has produced – or has been given sufficient time to produce – the change. The second consists of the researcher observing a phenomenon and attempting to establish what caused it. In this instance the researcher starts from the effect(s) or outcome(s) and attempts to determine causation. If a relationship is studied in the first way, starting from the

cause to establish the effects, it is classified as an experimental study. If the second path is followed – that is, starting from the effects to trace the cause – it is classified as a non-experimental study

Other designs commonly used in quantitative research

There are some research designs that may be classified in the typology described above but, because of their uniqueness and prevalence, have acquired their own names. They are therefore described separately below.

The cross-over comparative experimental design

The denial of treatment to the control group is considered unethical by some professionals. In addition, the denial of treatment may be unacceptable to some individuals in the control group, which could result in them dropping out of the experiment and/or going elsewhere to receive treatment. The former increases ‘experimental mortality’ and the latter may contaminate the study. The cross-over comparative experimental design makes it possible to measure the impact of a treatment without denying treatment to any group, though this design has its own problems.

In the cross-over design, also called the ABAB design (Grinnell 1993: 104), two groups are formed, the intervention is introduced to one of them and, after a certain period, the impact of this intervention is measured. Then the interventions are ‘crossed over’; that is, the experimental group becomes the control and vice versa, sometimes repeatedly over the period of the study

replicated cross-sectional design

In practice one usually examines programmes already in existence and ones in which clients are at different stages of an intervention.

Evaluating the effectiveness of such programmes within a conventional experimental design is impossible because a baseline cannot be established as the intervention has already been introduced. In this situation, the usual method of selecting a group of

people who were recently recruited to the programme and following them through until the intervention has been completed may take a long time. In such situations, it is possible to choose clients who are at different phases of the programme to form the basis of your study

Trend studies

If you want to map change over a period, a trend study is the most appropriate method of investigation. Trend analysis enables you to find out what has happened in the past, what is happening now and what is likely to happen in the future in a population group. This design involves selecting a number of data observation points in the past, together with a picture of the present or immediate past with respect to the phenomenon under study, and then making certain assumptions as to future trends. In a way you are collecting cross-sectional observations about the trend being observed at different points in time over past–present–future. From these cross-sectional observations you draw conclusions about the pattern of change.

Trend studies are useful in making forecasting by extrapolating present and past trends thus making a valuable contribution to planning. Trends regarding the phenomenon under study can be correlated with other characteristics of the study population. For example, you may want to examine the changes in political preference of a study population in relation to age, gender, income or ethnicity. This design can also be classified as retrospective–prospective study on the basis of the reference period classification system developed earlier in this chapter.

Cohort studies

Cohort studies are based upon the existence of a common characteristic such as year of birth, graduation or marriage, within a subgroup of a population. Suppose you want to study the employment pattern of a batch of accountants who graduated from a university in 1975, or study the fertility behaviour of women who were married in 1930. To study the accountants' career paths you would contact all the accountants who graduated from the university in 1975 to find out their employment histories. Similarly, you would investigate the fertility history of those women who married in 1930. Both of these studies could be carried out either as cross-sectional or longitudinal designs. If you adopt a cross-sectional design you gather the required information in one go, but if you choose the longitudinal design you collect the required information at different points in time over the study period.

Both these designs have their strengths and weaknesses. In the case of a longitudinal design, it is not important for the required information to be collected from the same respondents; however, it is important that all the respondents belong to the cohort being studied; that is, in the above examples they must have graduated in 1975 or married in 1930.

Panel studies

Panel studies are similar to trend and cohort studies except that in addition to being longitudinal they are also prospective in nature and the information is always collected from the same respondents. (In trend and cohort studies the information can be collected in a cross-sectional manner and the observation points can be retrospectively constructed.) Suppose you want to study the changes in the pattern of expenditure on household items in a community. To do this, you would select a few families to find out the amount they spend every fortnight on household items. You would keep collecting the same information from the same families over a period of time to ascertain the changes in the expenditure pattern. Similarly, a panel study design could be used to study the morbidity pattern in a community.

Blind studies

The concept of a blind study can be used with comparable and placebo experimental designs and is applied to studies measuring the effectiveness of a drug. In a blind study, the study population does not know whether it is getting real or fake treatment or which treatment modality. The main objective of designing a blind study is to isolate the placebo effect.

Double-blind studies

The concept of a double-blind study is very similar to that of a blind study except that it also tries to eliminate researcher bias by concealing the identity of the experimental and placebo groups from the researcher. In other words, in a double-blind study neither the researcher nor the study participants know who is receiving real and who is receiving fake treatment or which treatment model they are Receiving.