

Computing Research Project

Research methods



Objectives

- Data collection and analysis
- Collecting secondary data
- Collecting primary data
- Questionnaires and diaries
- Interviews: structured, semi-structured and open

- We will first look briefly at the three perspectives
 - data collection and analysis
 - quantitative and qualitative
 - research strategies

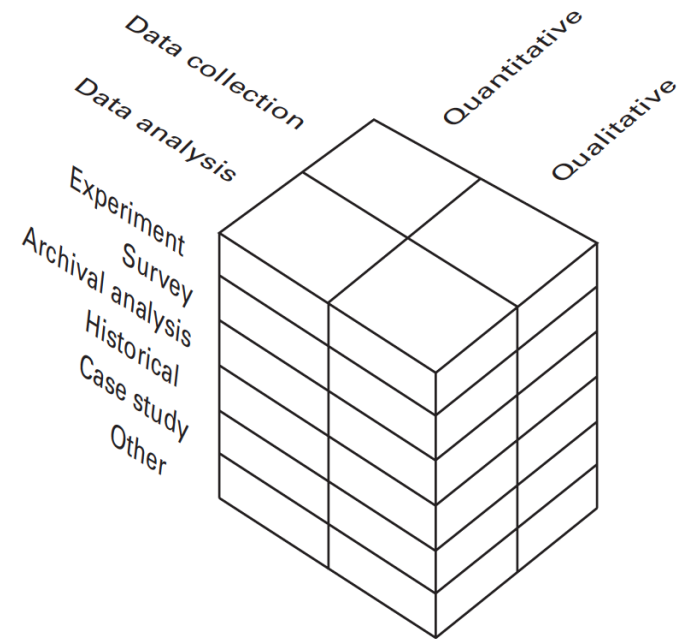


Diagram 7.1 Links between perspectives: matrix diagram

Data collection and analysis(1)

- In fact, it will often be appropriate to decide first on the type of analysis, quantitative or qualitative, which will be required to investigate your research problem, and then on the type of data which need to be collected in order to make that analysis.

Data collection and analysis(2)

- When considering what data you might require, consider carefully the sources, the availability and the possible methods of collecting the data.
- When considering analysis, think about the tools, techniques and resources required
- The different research strategies have often distinctly different methods for data collection and analysis

Quantitative and qualitative research

- When appropriate, a mixture of quantitative and qualitative research is possible
- It became increasingly obvious to some researchers that subjective human feelings and emotions were difficult (or impossible) to quantify

Research strategies

Table 7.1 Research strategies

| Strategy | Form of research question | Requires control over behaviour of events? | Focuses on contemporary events? |
|-------------------|---------------------------------------|--|---------------------------------|
| Experimental | How, why, what if? | Yes | Yes |
| Survey | Who, what, where, how many, how much? | No | Yes |
| Archival analysis | Who, what, where, how many, how much? | No | Yes/No |
| Historical | How, why? | No | No |
| Case study | How, why? | No | Yes |

Source: based on Yin, 1994, p. 6

Collecting secondary data

- Sources can be
 - Libraries and archives
 - Museums and collections
 - Government departments and commercial/professional bodies
 - The Internet
 - The field: Ancient cities, buildings, archaeological digs etc.
- Authentication: is usually carried out by experts(example: for example textual analysis, carbon dating, paper analysis, locational checks, cross-referencing and many others)
- Interpretation: the data recorded are not exactly in the form which you require In order to extract the exact data you require, you will have to extrapolate from the existing data

Collecting primary data

- Survey research
 - depends heavily on the process of sampling and on asking questions, either through questionnaires, interviews or observations
- Questionnaires and diaries
 - Asking questions is an obvious method of collecting both quantitative and qualitative information from people
- Interviews: structured, semi-structured and open
 - interviewing is suitable for quantitative data collection, it is particularly useful when qualitative data are required.
- Accounts
 - Accounts is a method of qualitative data collection, used mainly in sociological research

Survey research

‘Anyone’ can do a bad survey . . . To do a good survey requires expertise and professionalism at every stage: the design, sampling, questionnaire development, interviewing, analysis and reporting, based on an extensive theoretical framework well grounded in practice and methodological research. (Morton-Williams, 1993, p. 2)

Questionnaires and diaries

- Questionnaire enables you to organize the questions and receive replies without actually having to talk to every respondent.
- One of the main features of a questionnaire is its impersonality.
- They are the same for each respondent
- The responses can be completely anonymous, allowing potentially embarrassing questions to be asked with a fair chance of getting a true reply

Questionnaires and diaries(2)

- There is no geographical limitation
- Questionnaires can be a relatively economic method, in cost and time, of soliciting data from a large number of people
- Time for checking facts and pondering on the questions can also be taken by the respondents, which tends to lead to more accurate information.
- There are two basic methods of delivering questionnaires,
 - Personally
 - By post.

Personal delivery- Questionnaire

- Respondents can be helped to overcome difficulties with the questions
- Personal persuasion and reminders by the researcher can ensure a high response rate
- The reasons why some people refuse to answer the questionnaire can also be established, and there is a possibility of checking on responses if they seem odd or incomplete
- Obviously, there are problems in both time and geographical location which limit the scope and extent to which this method of delivery can be used

Post delivery- Questionnaire

- Most serious problem is that the rate of response is difficult to predict or control, particularly if there is no system of follow-up
- The pattern of nonresponse can have a serious effect on the validity of the sample by introducing bias into the data collected
- Cost is often a determining factor in choosing postal distribution: it is cheap compared with interviewing
- It might also be the only method of questioning people spread over a large area or situated in relatively inaccessible regions

There are simple rules to devising a questionnaire

- You must establish exactly which variables you wish to gather data about, and how these variables can be assessed
- The language must be unmistakably clear and unambiguous and make no inappropriate assumptions
 - Evaluate good/bad question: “How many cigarettes do you smoke each day: more than 25, 25–16, 15–11, 10–6, 5–1, none?”
- In order to enhance the response rate, questions generally should be kept simple, and the questionnaires kept as short as possible.
- Clear and professional presentation
- Consider how you will process the information from the completed forms

Pilot study-Questionnaire

- A questionnaire should be pre-tested on a small number of people in what is called a pilot study
- It is best to test it on people of a type similar to that of the intended sample, so as to anticipate any problems of comprehension or other sources of confusion

A diary method

- Can be used as a substitute for observation where direct observation is difficult or impossible, e.g. in intimate or private situations
- It can also be usefully used as a precursor to interviews: the information gained will provide pointers to an appropriate list of questions to be asked in the interview (Robson, 1993, pp. 254–5)

Interviews: structured, semi-structured and open

- Questionnaire surveys are not suitable for questions which require probing to obtain adequate information
- There are two main methods of conducting interviews;
 - face-to-face and telephone

Face-to-face interviews

- can be carried out in a variety of situations – in the home, at work, outdoors, on the move
- The interviewer is in a good position to be able to judge the quality of the responses of the subjects, to notice if a question has not been properly understood, and to reassure and encourage the respondent to be full in his/her answers.

Telephone interviews

- Avoid the necessity of travelling to the respondents, and all the time and problems associated with contacting people personally
- Surveys can be carried out more quickly than face-to-face, especially if the questionnaire is short (20–30 minutes is the maximum)
- However, visual aids cannot be used to explain questions
- Important visual clues between interviewer and interviewee, e.g. eye contact, smiling, puzzled looks, are absent
- It is interesting to note that voice quality is an important factor in successful phone interviews
- Interviewers with the highest success rates spoke rapidly and loudly, used standard pronunciation and sounded competent and confident

The structuring of the interview

- For very precise answers to very precise questions, used for quantitative and statistical analysis, a tightly structured interview is required with closed questions formulated in a method similar to a questionnaire
- If you need to explore a situation and wish to get information which you cannot predict, a very open and unstructured form of interview is appropriate
- A semi-structured interview falls between the two

The structuring of the interview

- Are a useful method of obtaining information and opinions from experts during the early stages of your research project
- These early interviews often provide very important information which helps not only to indicate your future research direction, but also to identify and prioritize issues
- There is a great difference in technique for conducting interviews 'cold' with the general public and interviewing officials or experts by appointment
- Personality and bearing of the interviewer are of great importance

- Dr Nicholas Walliman 2010 Your Research Project, A step By step guide for the first time researcher