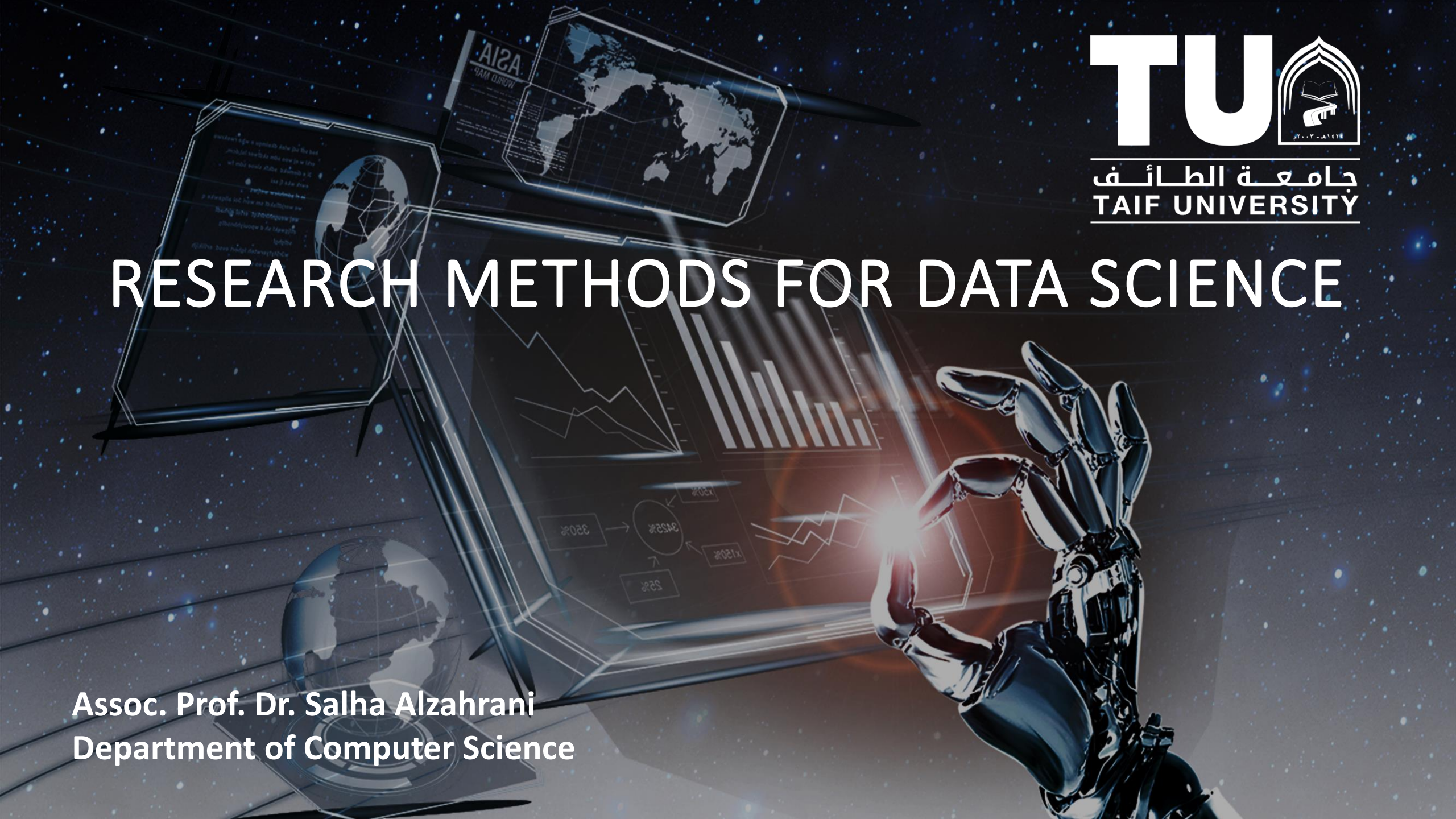

جامعة الطائف
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RESEARCH METHODS FOR DATA SCIENCE

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STEP 1: Formulating a research problem

Part II

My Notes

~Research Questions

~Objectives

The research problem

The central aim of this chapter is to detail the process of formulating a research problem, even though the specific procedure that you are likely to adopt depends upon:

- your expertise in research methodology;
- your knowledge of the subject area;
- your understanding of the issues to be examined;
- the extent to which the focus of your study is predetermined; and
- your own orientation to the research methodology – quantitative, qualitative or mixed.

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The research problem

If you are not very familiar with the research process and/or do not have a very specific idea about what is to be researched, you need to follow every step detailed in this chapter. However, more experienced researchers can take a number of shortcuts. The process outlined here assumes that you have neither the required knowledge of the process of formulating a research problem nor a specific idea about what is to be researched. If you have a specific idea for the basis of your enquiry, you do not need to go through this chapter. IIowever, you should make sure that your idea is researchable as not all problems lend themselves to research methodologies.

Research problem: Any issue, problem or question that becomes the basis of your enquiry. It is what you want to find out about during your research endeavour.

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The research problem

Broadly speaking, any question that you want answered and any assumption or assertion that you want to challenge or investigate can become a **research problem** or a research topic for your study. However, it is important to remember that not all questions can be transformed into research problems and some may prove to be extremely difficult to study. According to Powers et al. (1985: 38), 'Potential research questions may occur to us on a regular basis, but the process of formulating them in a meaningful way is not at all an easy task'. As a newcomer it might seem easy to formulate a problem but it requires

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The research problem

considerable knowledge of both the **subject area** and research methodology. Once you examine a question more closely you will soon realise the complexity of formulating an idea into a problem which is researchable. 'First identifying and then specifying a research problem might seem like research tasks that ought to be easy and quickly accomplished. However, such is often not the case' (Yegidis & Weinback 1991: 35).

It is essential for the problem you formulate to be able to withstand scrutiny in terms of the procedures required to be undertaken. Hence you should spend considerable time in thinking it through.

Subject area: Any academic or practice field in which you are conducting your study is called the subject or study area. It could be health or other needs of a community, attitudes of people towards an issue, occupational mobility in a community, coping strategies, depression, domestic violence, etc.

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The importance of formulating a research problem

The formulation of a research problem is the first and most important step of the research process. It is like the identification of a destination before undertaking a journey. In the absence of a destination, it is impossible to identify the shortest – or indeed any – route. Similarly, in the absence of a clear research problem, a clear and economical plan is impossible. To use another analogy, a research problem is like the foundation of a building. The type and design of the building are dependent upon the foundation. If the foundation is well designed and strong you can expect the building to be also. The research problem serves as the foundation of a research study: if it is well formulated, you can expect a good study to follow. According to Kerlinger (1986: 17): 'If one wants to solve a problem, one must generally know what the problem is. It can be said that a large part of the problem lies in knowing what one is trying to do.' You must have a clear idea with regard to what it is that you want to find out about and not what you think you must find.

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The importance of formulating a research problem

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A research problem may take a number of forms, from the very simple to the very complex. The way you formulate a problem determines almost every step that follows: the type of study design that can be used; the type of sampling strategy that can be employed; the research instrument that can be used or developed; and the type of analysis that can be undertaken.

The formulation of a problem is like the 'input' to a study, and the 'output' – the quality of the contents of the research report and the validity of the associations or causation established – is entirely dependent upon it. Hence the famous saying about computers, 'garbage in, garbage out', is equally applicable to research problems.

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Sources of research problems

This section is of particular relevance if you have not yet selected a research topic and do not know where to start. If you have already selected your topic or question, go on to the next section.

Most research in the humanities revolves around the four Ps: people, problems, programmes and phenomena. In fact, a closer look at any academic or occupational field will show that most research revolves around these four Ps. The emphasis on a particular 'P' may vary from study to study but generally, in practice, most research studies are based upon a combination of at least two Ps. You may select a group of individuals (a group of individuals, or a community as such – people) to examine the existence of certain issues or problems relating to their lives, to ascertain their attitude towards an issue (problem), to establish the existence of a regularity or occurrence (phenomenon) or to evaluate the

Sources of research problems

effectiveness of an intervention (programme). Your focus may be on the study of an issue, an association or a phenomenon per se; for example, the relationship between unemployment and street crime, smoking and cancer, fertility and mortality, delinquency and street crime, or academic achievement and home environment, carried out on the basis of information collected from individuals, groups, communities or organisations. The emphasis in these studies is on exploring, discovering or establishing associations or causation. Similarly, you can study different aspects of a programme: its effectiveness, its structure, the need for it, consumers' satisfaction with it, and so on. In order to ascertain these you collect information from people.

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Considerations when selecting a research problem

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When selecting a research problem or topic there are a number of considerations to keep in mind which will help to ensure that your study will be manageable and that you remain motivated:

- **Interest** – This should be the most important consideration in selecting a research problem. A research endeavour is usually time-consuming and involves hard work and possibly unforeseen problems. If you select a topic which does not greatly interest you, it could become extremely difficult to sustain the required motivation and put in enough time and energy to complete it.

Considerations when selecting a research problem

- **Magnitude** – You should have sufficient knowledge about the research process to be able to visualise the work involved in completing the proposed study. Narrow the topic down to something manageable, specific and clear. It is extremely important to select a topic that you can manage within the time and with the resources at your disposal. Even if you are undertaking a descriptive study, you need to consider its magnitude carefully.

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Considerations when selecting a research problem

My Notes

- **Measurement of concepts** – If you are using a **concept** in your study (in quantitative studies), make sure you are clear about its indicators and their measurement. For example, if you plan to measure the effectiveness of a health promotion programme or a programme to rehabilitate asylum seekers in a country or random breath testing programme, you must be clear as to what determines effectiveness and how it will be measured. Do not use concepts in your research problem that you are not sure how to measure. This does not mean you cannot develop a measurement procedure as the study progresses. While most of the developmental work will be done during your study, it is imperative that you are reasonably clear about the measurement of these concepts at this stage.

Considerations when selecting a research problem

- **Level of expertise** – Make sure you have an adequate level of expertise for the task you are proposing. Allow for the fact that you will learn during the study and may receive help from your research supervisor and others, but remember that you need to do most of the work yourself.

My Notes

Considerations when selecting a research problem

My Notes

- **Relevance** – Select a topic that is of relevance to you as a professional. Ensure that your study adds to the existing body of knowledge, bridges current gaps or is useful in policy formulation. This will help you to sustain interest in the study.

Considerations when selecting a research problem

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- **Availability of data** – If your topic entails collection of information from secondary sources (office records, client records, census or other already published reports, etc.) make sure that this data is available and in the format you want before finalising your topic.

Considerations when selecting a research problem

My Notes

- **Ethical issues** – Another important consideration in formulating a research problem is the ethical issues involved. In the course of conducting a research study, the study population may be adversely affected by some of the questions (directly or indirectly); deprived of an intervention; expected to share sensitive and private information; or expected to be simply experimental 'guinea pigs'. How ethical issues can affect the study population and how ethical problems can be overcome should be thoroughly examined at the problem formulation stage.

Steps in formulating a research problem

The formulation of a research problem is the most crucial part of the research journey as the quality and relevance of your research project entirely depend upon it. As mentioned earlier, every step that constitutes the *how* part of the research journey (Figure 2.1) depends upon the way you formulated your research problem. Despite the importance of this step, there is very little available by way of specific guidance in other books. This task is largely left either to the teachers of research methodology or to students to learn for themselves. One of the strengths of this book is that it offers the beginner a very specific set of step-by-step guidelines in one place, despite the fear of being labelled as prescriptive.

The process of formulating a research problem consists of a number of steps. Working through these steps presupposes a reasonable level of knowledge in the broad subject area within which the study is to be undertaken and the research methodology itself. A brief review of the relevant literature helps enormously in broadening this knowledge base. Without such knowledge it is difficult to 'dissect' a subject area clearly and adequately.

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Steps in formulating a research problem

My Notes

Step ONE **Identify a broad field or subject area of interest to you**. It is imperative to do this at the very beginning, before starting out on your research journey. Ask yourself, 'What is it that really interests me as a professional?' In the author's opinion, it is a good idea to think about the field in which you would like to work after graduation. This will help you to find an interesting topic, and one which may be of use to you in the future.

Steps in formulating a research problem

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Step TWO **Dissect the broad area into subareas.** At the outset, you will realise that all the broad areas mentioned above – youth welfare, refugees, domestic violence, consumer behaviour and HIV/AIDS – have many aspects. For example, there are many aspects and issues in the area of domestic violence, illustrated in Figure 4.1.

Steps in formulating a research problem

Step THREE **Select what is of most interest to you.** It is neither advisable nor feasible to study all subareas. From your list, select issues, questions or subareas about which you are passionate. Your interest should be the most important determinant for selection, even though there are other considerations as discussed in the previous section. One way to decide what interests you most is to start with a process of elimination. Go through your list and delete all those subareas, issues or questions in which you are not very interested. You will find that towards the end of this process, it will become very difficult for you to delete anything further. You need to continue until you are left with something that is *manageable,* considering the time available to you, your level of expertise and other resources needed to undertake the study. Once you are confident that you have selected something that you are passionate about and can manage, you are ready to go to the next step.

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Steps in formulating a research problem

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Step FOUR **Raise research questions**. At this step ask yourself, 'What is it that I want to find out about in this subarea?' Make a list of whatever questions come to mind relating to your chosen subarea and if you think there are too many to be manageable, go through the same process of elimination as in step 3.

Steps in formulating a research problem

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Step FIVE **Formulate objectives**. Both your main objectives and your subobjectives now need to be formulated, based on your research questions. The main difference between objectives and research questions is the way in which they are written. Research questions are obviously that – questions. Objectives transform these questions into behavioural aims by using action-oriented phrases such as 'to find out', 'to determine', 'to ascertain' and 'to examine'. Some researchers prefer to reverse the process; that is, they start from objectives and formulate research questions from them. Some researchers are satisfied only with research questions, and do not formulate objectives at all. If you prefer to have only research questions or only objectives, this is fine, but keep in mind the requirements of your institution for research proposals. For guidance on formulating objectives, see the next section.

Steps in formulating a research problem

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Step SIX **Assess your objectives.** Now examine your objectives to ascertain the feasibility of achieving them through your research endeavour. Consider them in the light of the time, resources (financial and human) and technical expertise at your disposal.

Steps in formulating a research problem

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Step SEVEN **Double-check**. Go back and give final consideration to whether or not you are sufficiently interested in the study, and have adequate resources to undertake it. Ask yourself, 'Am I really enthusiastic about this study?' and 'Do I really have enough resources to undertake it?' Answer these questions thoughtfully and realistically. If your answer to one of them is 'no', reassess your objectives.

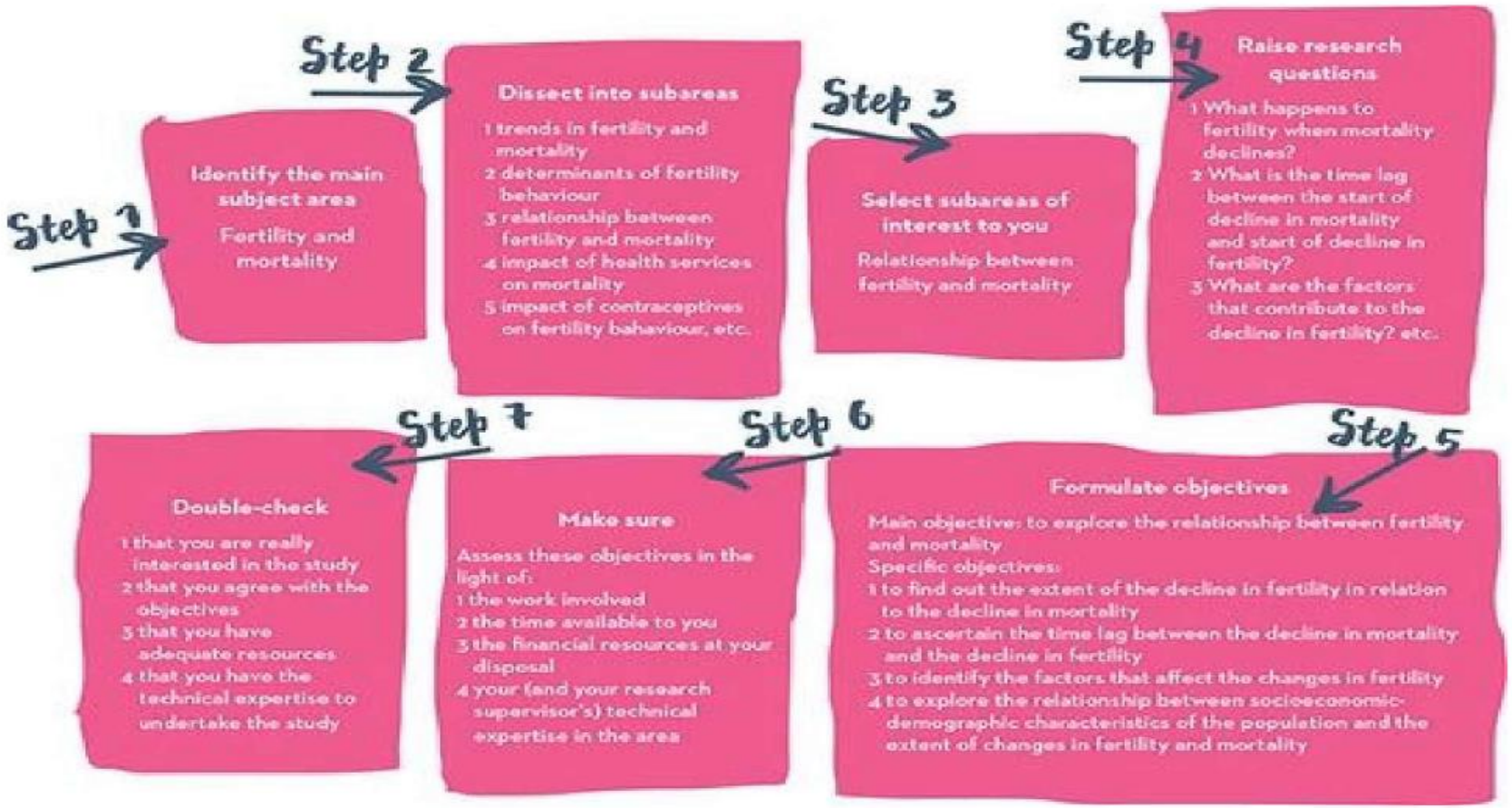

Figure 4.4 Narrowing down a research problem – health

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The formulation of research objectives

Objectives are the goals you set out to attain in your study. Since these objectives inform the reader of what you want to achieve in the study, it is extremely important to word them clearly and specifically.

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The formulation of research objectives

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Researchable questions

It is important to distinguish between main objectives and subobjectives. The main objective relates to the overall thrust of your study. It is also concerned with the main associations and relationships that you seek to discover or establish. The subobjectives are the specific aspects of the topic that you want to investigate within the main framework of your study.

Subobjectives should be listed numerically. They should be worded clearly and unambiguously. Make sure that each subobjective contains only one aspect of the study. Use action-oriented words or verbs when writing your objectives. The objectives should start with words such as 'to determine', 'to find out', 'to ascertain', 'to measure' and 'to explore'.

The formulation of research objectives

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The way the main objectives and subobjectives are worded determines how your research is classified (e.g. descriptive, correlational or experimental). In other words, the wording of your objectives determines the type of research design you need to adopt to achieve them. Hence, be careful about the way you word your objectives.

Irrespective of the type of research, the objectives should be expressed in such a way that the wording clearly, completely and specifically communicates your intention to your readers. There is no place for ambiguity, non-specificity or incompleteness, either in the wording of your objectives or in the ideas they communicate. Figure 4.5 displays the characteristics of the wording of objectives in relation to the type of research study.

If your study is primarily descriptive, your main objective should clearly describe the major focus of your study, even mentioning the organisation and its location unless these are to be kept confidential (e.g. to describe the types of treatment

The formulation of research objectives

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programme provided by [name of the organisation] to alcoholics in [name of the place] *or* to find out the opinion of the community about the health services provided by [name of the health centre/department] in [name of the place]). Identification of the organisation and its location is important as the services may be peculiar to the place and the organisation and may not represent the services provided by others to similar populations.

If your study is correlational in nature, in addition to the first three characteristics shown in Figure 4.5, the wording of the main objective should also include the main variables being correlated (e.g. to ascertain the *impact of migration* on *family roles* or to compare the effectiveness of *different teaching methods* on the *comprehension of students*).

If the overall thrust of your study is to test a hypothesis, the wording of the main objectives should also indicate the direction of the relationship being tested (e.g. to ascertain if an *increase in youth unemployment* will *increase the incidence of street crime*, or to demonstrate that the provision of maternal and child health services to Aboriginal people in rural Australia will *reduce infant mortality*).

Watch this video: How do you choose a research topic?

Watch this video: How to Develop a STRONG Research Question?

Watch this video: How do you narrow your topic into a researchable problem?

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