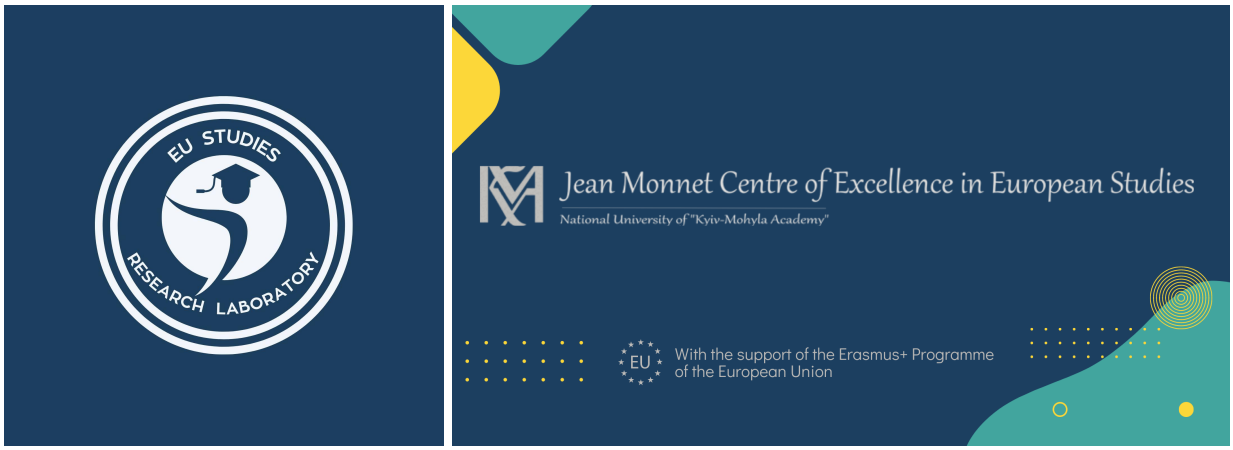

Handbook

Research materials

Project “EU Studies Research Laboratory”

Introduction

1. How to write an effective methodology section
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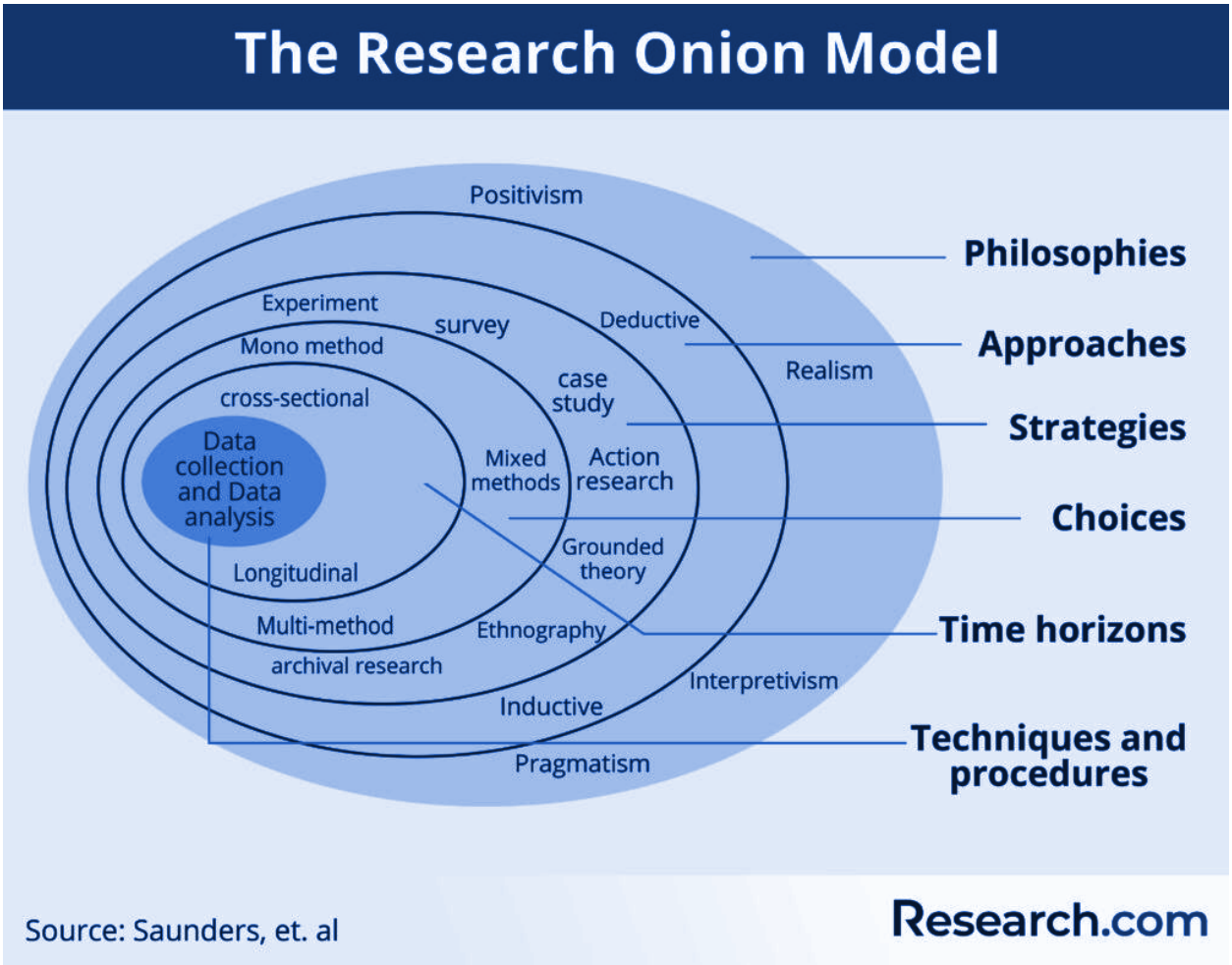
1. How to write an effective methodology section

Saunders, M., Lewis, P., & Thornhill, A., in the book "Research Methods for Business Students", proposed the concept of the research onion model to help researchers develop a methodology and construct research design techniques within the field of future studies. This research onion model has six main layers, which serve as a step-by-step guide for researchers on how to write a research methodology.



The methodology section of your research paper is not all about describing your data-gathering process and your analysis. The methodology is about the overall approaches and perspectives of the research process. Here are some tips as well as problems to avoid in order to write an effective research methodology. Out of these, you can construct your own research methodology example for future reference. While doing so, you can apply research methodology best practices for optimal results.

How to write an effective methodology section?

- **Introduce your methods.** Introduce the methodological approach used in investigating your research problem. In one of the previous sections, your methodological approach can either be quantitative, qualitative, or mixed methods. Look for a methodology in the research example that you can use as a reference.
- **Establish the methodological connection**. Explain the relevance of your methodological approach to the overall research design. Keep in mind that the connection between your methods and your research problem should be clear. This means that your methodology of research must be appropriate to achieve your paper's objective—to address the research problem you presented. To wit, if you need help writing your research problem, refer to our article on what is a research question.
- **Introduce your instruments.** Indicate the research instruments you are going to use in collecting your data and explain how you are going to use them. These tools and instruments can be your surveys, questionnaires for interviews, observation, etc. If your methods include archival research or analyzing existing data, provide background information for documents, including who the original researcher is, as well as how the data were originally created and gathered. Keep in mind that aside from your methodology in the research paper, the identification of the research instrument is equally significant.
- **Discuss your analysis.** Explain how you are going to analyze the results of your data-gathering process. Depending on your methodology, research for ways on how you can best execute your study, either by using statistical analysis or

exploring theoretical perspectives to support your explanation of observed behaviors.

- **Provide background information.** When using methods that your readers may be unfamiliar with, make sure to provide background information about these methods. It would also help if you can provide your research methodology meaning so you can present a clear and comprehensive research context.
- **Discuss the sampling process.** Sampling procedures are vital components of your methodology. Explain the reason behind your sampling procedure. For example, if you are using statistics in your research, indicate why you chose this method as well as your sampling procedure. If you are going to do interviews, describe how are you going to choose the participants and how the interviews will be conducted.
- **Address research limitations**. Make sure to address possible limitations you may encounter in your research, such as practical limitations that may affect your data-gathering process. If there are potential issues you anticipate encountering in the process, indicate your reason why you still decide to use the methodology despite the risk.

What to avoid in writing the methodology section of your research?

- Avoid including irrelevant details.
- Keep your methodology section straightforward and thorough. Details that do not contribute to the readers' understanding of your chosen methods should not be included in your methodology section.
- Irrelevant information includes unnecessary explanations of basic procedures. Basic procedures should only be explained if they are unconventional and unfamiliar to the readers.
- Do not ignore the problems you might encounter during the data-gathering process. Instead of turning a blind eye, describe how you handled them.

2. What are the Research Methods

Research methods are the strategies, processes, or techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create a better understanding of a topic.

There are different types of research methods that use different tools for data collection, such as (1) Qualitative Research; (2) Quantitative Research; and (3) Mixed Methods Research.

Types of research

Qualitative Research gathers data about lived experiences, emotions, or behaviors, and the meanings individuals attach to them. It assists in enabling researchers to gain a better understanding of complex concepts, social interactions, or cultural phenomena. This type

of research is useful in the exploration of how or why things have occurred, interpreting events, and describing actions.

Techniques or Tools:

- **Interviews:** these can be structured, semi-structured, or unstructured in-depth sessions with the researcher and a participant.
- **Focus groups:** with several participants discussing a particular topic or a set of questions. Researchers can be facilitators or observers.
- **Observations:** On-site, in-context, or role-play options.
- **Document analysis:** Interrogation of correspondence (letters, diaries, emails, etc.) or reports.
- **Oral history or life stories:** Remembrances or memories of experiences told to the researcher.
- **Surveys or questionnaires:** which ask the same questions to large numbers of participants or use Likert scales which measure opinions as numerical data.
- **Observation:** which can either involve counting the number of times a specific phenomenon occurs, or the coding of observational data in order to translate it into numbers.
- **Document screening:** sourcing numerical data from financial reports or counting word occurrences.
- **Experiments:** testing hypotheses in laboratories, testing cause, and effect relationships, through field experiments, or via quasi- or natural experiments.

Quantitative Research gathers numerical data which can be ranked, measured, or categorized through statistical analysis. It assists with uncovering patterns or relationships and making generalizations. This type of research is useful for finding out how many, how much, how often, or to what extent.

Mixed Methods Research integrates both Qualitative and Quantitative Research. It provides a holistic approach combining and analyzing the statistical data with deeper

contextualized insights. Using Mixed Methods also enables Triangulation, or verification, of the data from two or more sources.

3. Steps in the Research Methods

Research is a systematic way of answering questions about the world. It is intended to increase knowledge about the process of developing an understanding of the natural laws governing the universe; innovations or new ideas; commitment, and technological advantages, which will improve the welfare of humanity.

Everybody takes part in some type of research. As individuals communicate with the world, they characterize explicit issues, gather data (information), examine the information, and settle on choices based on the information they obtained. This procedure can happen casually, now and again, or unconsciously. It is normally not logical and will, in general, be mistake-inclined; thus, the idea of learning by experimentation. Scientifically organized research has clearly defined characteristics that

must be deliberately and unbiasedly pursued. Furthermore, the non-scientific examination is inclined to an assortment of distorting factors.

Any research consists of the following steps:

Step 1. Identify the research problem

The first step in the scientific method is usually characterized by realizing that some problem exists. This manifests in the form of a question that troubles the mind.

Step 2. Clarify and contextualize the problem

By participating in discussion and studying or reviewing current literature on what one is exploring, the issue is illuminated and the nature and specifics of interest of the problem are identified. As the issue is clarified, the underlying inquiry prompts more inquiries and the dynamic illumination of variables that may influence the examination of the underlying problem begins to improve our understanding and show increasing complexity.

Step 3. Develop a research design

This entails all activities the researcher engages in when planning an arrangement for the exploration. A set of research questions or a theory should be detailed as informed speculation about the conceivable responses to the issue. Now in the examination structure, the researcher has two differentiating approaches that offer them alternative courses in the advancement of the plan. The researcher may select the interpretive-inductive methodology, where they start to observe before arriving at conceivable clarifications, or they may select the hypothetical deductive methodology, where the starting point is a hypothesis or a theory.

Step 4. Examine the data collected for the underlying patterns

When the research design is finished and information gathered, the researcher needs to inspect the information for fundamental patterns that recommend answers to the research exploration questions or test the adequacy of the hypothesis using proper statistical devices. Simultaneously, the researcher needs to perceive how the discoveries of the examination hypothesis and the mind in the field affect the theory or hypothesis.

Step 5. Interpret the findings

The progression includes the understanding of the discoveries and generalization of the conclusion to the bigger collection of knowledge about the phenomenon. One of the objectives in this phase of the examination is to contribute change or expound on existing exploration and hypotheses in the field. This procedure may recommend strategies to discover the context of the problem.

4. How to review the literature in Research (part 1)

If you do not have a specific research problem, you should review the literature in your broad area of interest with the aim of gradually narrowing it down to what you want to find out about. After that, the literature review should be focused around your research problem. There is a danger in reviewing the literature without having a reasonably specific idea of what you want to study. It can condition your thinking about your study and the methodology you might use, resulting in a less innovative choice of research problem and methodology than otherwise would have been the case. Hence, you should try broadly to conceptualise your research problem before undertaking your major literature review.

There are four steps involved in conducting a literature review:

1. Searching for the existing literature in your area of study.
2. Reviewing the selected literature.

3. Developing a theoretical framework.
4. Developing a conceptual framework.

The skills required for these tasks are different. Developing theoretical and conceptual frameworks is more difficult than the other tasks.

Searching for the existing literature

To search effectively for the literature in your field of inquiry, it is imperative that you have at least some idea of the broad subject area and the problem you wish to investigate in order to set parameters for your search. Next, compile a bibliography for this broad area. There are three sources that you can use to prepare a bibliography:

- books;
- journals;
- the Internet.

Books

Though books are a central part of any bibliography, they have their disadvantages as well as advantages. The main advantage is that the material published in books is usually important and of good quality, and the findings are 'integrated with other research to form a coherent body of knowledge. The main disadvantage is that the material is not completely up to date, as it can take a few years between the completion of a work and its publication in the form of a book.

The best way to search for a book is to look at your library catalogues. When librarians catalogue a book, they also assign to it subject headings that are usually based on Library of Congress Subject Headings. If you are not sure, ask your librarian to help you find the best subject heading for your area. This can save you a lot of time. Publications such as the Book Review Index can help you to locate books of interest.

Use the subject catalogue or keywords option to search for books in your area of interest. Narrow the subject area searched by selecting the appropriate keywords. Look through these titles carefully and identify the books you think are likely to be of interest to you. If you think the titles seem appropriate to your topic, print them out (if this facility is available), as this will save you time, or note them down on a piece of paper. Be aware that sometimes a title does not provide enough information to help you decide if a book is going to be of use so you may have to examine its contents too.

When you have selected 10–15 books that you think are appropriate for your topic, examine the bibliography of each one. It will save time if you photocopy their bibliographies. Go through these bibliographies carefully to identify the books common to several of them. If a book has been referenced by a number of authors, you should include it in your reading list. Prepare a final list of books that you consider essential reading.

Having prepared your reading list, locate these books in your library or borrow them from other sources. Examine their contents to double-check that they really are relevant to your topic. If you find that a book is not relevant to your research, delete it from your reading list. If you find that something in a book's contents is relevant to your topic, make an annotated bibliography. An annotated bibliography contains a brief abstract of the aspects covered in a book and your own notes of its relevance. Be careful to keep track of your references. To do this you can prepare your own card index or use a computer program such as Endnotes or Pro-Cite.

Journals

You need to go through the journals relating to your research in a similar manner. Journals provide you with the most up-to-date information, even though there is often a gap of two to three years between the completion of a research project and its publication in a journal. You should select as many journals as you possibly can, though the number of journals available depends upon the field of study – certain fields have more journals than others. As with books, you need to prepare a list of the journals you

want to examine for identifying the literature relevant to your study. This can be done in a number of ways. You can:

- locate the hard copies of the journals that are appropriate to your study;
- look at citation or abstract indices to identify and/or read the abstracts of such articles;
- search electronic databases.

If you have been able to identify any useful journals and articles, prepare a list of those you want to examine, by journal. Select one of these journals and, starting with the latest issue, examine its contents page to see if there is an article of relevance to your research topic. If you feel that a particular article is of interest to you, read its abstract. If you think you are likely to use it, depending upon your financial resources, either photocopy it, or prepare a summary and record its reference for later use. There are several sources designed to make your search for journals easier and these can save you enormous time. They are:

- indices of journals (e.g. Humanities Index);
- abstracts of articles (e.g. ERIC);
- citation indices (e.g. Social Sciences Citation Index).

Each of these indexing, abstracting and citation services is available in print, or accessible through the Internet.

In most libraries, information on books, journals and abstracts is stored on computers. In each case the information is classified by subject, author and title. You may also have the keywords option (author/keyword; title/keyword; subject/keyword; expert/keyword; or just keywords). What system you use depends upon what is available in your library and what you are familiar with.

There are specially prepared electronic databases in a number of disciplines. These can also be helpful in preparing a bibliography.

Select the database most appropriate to your area of study to see if there are any useful references. Of course, any computer database search is restricted to those journals and articles that are already on the database. You should also talk to your research supervisor and other available experts to find out about any additional relevant literature to include in your reading list.

The Internet

In almost every academic discipline and professional field, the Internet has become an important tool for finding published literature. Through an Internet search you can identify published material in books, journals and other sources with immense ease and speed.

An Internet search is carried out through search engines, of which there are many, though the most commonly used are Google and Yahoo. Searching through the Internet is very similar to the search for books and articles in a library using an electronic catalogue, as it is based on the use of keywords. An Internet search basically identifies all material in the database of a search engine that contains the keywords you specify, either individually or in combination. It is important that you choose words or combinations of words that other people are likely to use.

Most search facilities use Boolean logic, which allows three types of basic search “AND”, “OR” and “NOT”. With practice, you will become more efficient and effective in using keywords in combination with AND, OR and NOT, and so learn to narrow your search to help you identify the most relevant references.

How to review the literature in the research (part 2)

Reviewing the selected literature

Now that you have identified several books and articles as useful, the next step is to start reading them critically to pull together themes and issues that are of relevance to your study. Unless you have a theoretical framework of themes in mind to start with, use separate sheets of paper for each theme or issue you identify as you go through selected books and articles. The following example details the process.

The author recently examined, as part of an evaluation study, the extent of practice of the concept of 'community responsiveness' in the delivery of health services in Western Australia by health service providers. Before evaluating the extent of its use, pertinent literature relating to 'community responsiveness in health' was identified and reviewed. Through this review, many themes emerged, which became the basis of developing the

theoretical framework for the study. Out of all of this, the following themes were selected to construct the theoretical framework for the evaluation study:

- Community responsiveness: what does it mean?
- Philosophies underpinning community responsiveness.
- Historical development of the concept in Australia.
- The extent of use in health planning?
- Strategies developed to achieve community responsiveness.
- Indicators of success or failure.
- Seeking community participation.
- Difficulties in implementing community responsiveness.
- Attitude of stakeholders towards the concept of community responsiveness.

Once you develop a rough framework, slot the findings from the material so far reviewed into these themes, using a separate sheet of paper for each theme of the framework so far developed. As you read further, go on slotting the information where it logically belongs under the themes so far developed. Keep in mind that you may need to add more themes as you go along. While going through the literature you should carefully and critically examine it with respect to the following aspects:

- Note whether the knowledge relevant to your theoretical framework has been confirmed beyond doubt.
- Note the theories put forward, the criticisms of these and their basis, the methodologies adopted (study design, sample size and its characteristics, measurement procedures, etc.) and the criticisms of them.
- Examine to what extent the findings can be generalised to other situations.
- Notice where there are significant differences of opinion among researchers and give your opinion about the validity of these differences.
- Ascertain the areas in which little or nothing is known – the gaps that exist in the body of knowledge.

Developing a theoretical framework

Examining the literature can be a never-ending task, but as you have limited time it is important to set parameters by reviewing the literature in relation to some main themes pertinent to your research topic. As you start reading the literature, you will soon discover that the problem you wish to investigate has its roots in a number of theories that have been developed from different perspectives. The information obtained from different books and journals now needs to be sorted under the main themes and theories, highlighting agreements and disagreements among the authors and identifying the unanswered questions or gaps. You will also realise that the literature deals with a number of aspects that have a direct or indirect bearing on your research topic. Use these aspects as a basis for developing your theoretical framework. Your review of the literature should sort out the information, as mentioned earlier, within this framework. Unless you review the literature in relation to this framework, you will not be able to develop a focus in your literature search: that is, your theoretical framework provides you with a guide as you read.

This brings us to the paradox mentioned previously: until you go through the literature you cannot develop a theoretical framework, and until you have developed a theoretical framework you cannot effectively review the literature. The solution is to read some of the literature and then attempt to develop a framework, even a loose one, within which you can organise the rest of the literature you read. As you read more about the area, you are likely to change the framework. However, without it, you will get bogged down in a great deal of unnecessary reading and note-taking that may not be relevant to your study.

Literature pertinent to your study may deal with two types of information:

1. universal;
2. more specific (i.e. local trends or a specific programme).

In writing about such information you should start with the general information, gradually narrowing it down to the specific.

Developing a conceptual framework

The conceptual framework is the basis of your research problem. It stems from the theoretical framework and usually focuses on the section(s) which become the basis of your study. Whereas the theoretical framework consists of the theories or issues in which your study is embedded, the conceptual framework describes the aspects you selected from the theoretical framework to become the basis of your enquiry. The theoretical framework includes all the theories that have been put forward to explain the relationship between fertility and mortality. However, out of these, you may be planning to test only one, say the fear of non-survival. Similarly, the conceptual framework is focused on indicators to measure the success or failure of the strategies to enhance community responsiveness. Hence the conceptual framework grows out of the theoretical framework and relates to the specific research problem.

Writing about the literature reviewed

Now, all that remains to be done is to write about the literature you have reviewed. As mentioned in the beginning of this chapter, two of the broad functions of a literature review are (1) to provide a theoretical background to your study and (2) to enable you to contextualise your findings in relation to the existing body of knowledge in addition to refining your methodology. The content of your literature review should reflect these two purposes. In order to fulfil the first purpose, you should identify and describe various theories relevant to your field; and specify gaps in existing knowledge in the area, recent advances in the area of study, current trends and so on. In order to comply with the second function you should integrate the results from your study with specific and relevant findings from the existing literature by comparing the two for confirmation or contradiction. Note that at this stage you can only accomplish the first function of the literature review, to provide a theoretical background to your study. For the second

function, the contextualisation of the findings, you have to wait till you are at the research report writing stage.

While reading the literature for theoretical background of your study, you will realise that certain themes have emerged. List the main ones, converting them into subheadings. Some people write up the entire literature review in one section, entitled ‘Review of the literature’, ‘Summary of literature’ or ‘The literature review’, without subheadings, but the author strongly suggests that you write your literature review under subheadings based upon the main themes that you have discovered and which form the basis of your theoretical framework. These subheadings should be precise, descriptive of the theme in question and follow a logical progression. Now, under each subheading, record the main findings with respect to the theme in question (thematic writing), highlighting the reasons for and against an argument if they exist, and identifying gaps and issues.

The second broad function of the literature review – contextualising the findings of your study – requires you to compare very systematically your findings with those made by others. Quote from these studies to show how your findings contradict, confirm or add to them. It places your findings in the context of what others have found out providing complete reference in an acceptable format. This function is undertaken, as mentioned earlier, when writing about your findings, that is after analysis of your data.

Review the literature in research: Summary

Reviewing the literature is a continuous process. It begins before a research problem is finalised and continues until the report is finished. There is a paradox in the literature review: you cannot undertake an effective literature review unless you have formulated a research problem, yet your literature search plays an extremely important role in helping you to formulate your research problem. The literature review brings clarity and focus to your research problem, improves your research methodology and broadens your knowledge base.

Reviewing the literature involves a number of steps: searching for existing literature in your area of study; reviewing the selected literature; using it to develop a theoretical framework from which your study emerges and also using it to develop a conceptual framework which will become the basis of your investigation. The main sources for identifying literature are books, journals and the Internet. There are several sources which can provide information about locating relevant journals.

The literature review serves two important function:

1. it provides theoretical background to your study;

2. it helps you to contextualise your findings by comparing them with what others have found out in relation to the area of enquiry. At this stage of the research process, only the first function can be fulfilled. You can only take steps to achieve the second function when you have analysed your data and are in the process of writing about your findings.

Your writing about the literature reviewed should be thematic in nature, that is based on main themes; the sequence of these themes in the write-up should follow a logical progression; various arguments should be substantiated with specific quotations and citations from the literature and should adhere to an acceptable academic referencing style.

5. Overview of the Research Strategy

Research methodology in a research study is considered as an important element, and therefore determining the method of research methodology is a very important section in the study. Research methodology is useful to establish the structure of research, such as strategy, approach, research philosophy, and components of the methodology.

Research Strategy

The research strategy should be defined as “the general plan of how the researcher will go about answering the research questions”. Research strategy “provides the overall direction of the research, including the process by which the research is conducted”. A chosen research strategy depends on research questions as well as the goals of the research.

Research strategy selected based on three conditions, which are:

1. The type of question
2. The control the researcher has over behavioral events
3. The focus on contemporary as opposed to historical events

Research strategy can be defined as developing a clear plan to research and clarify the research's aims, to enable the researcher to conduct research systematically rather than haphazardly.

Case Study

Case study should be defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". 'how' and 'why' questions are frequently posed, case studies are the preferred strategy.

In research strategy, the case study is most common when the phenomenon cannot be divorced from its context, which depends on the qualitative approach as a method to be used in an information system.

The case study considers as a method that can investigate a contemporary phenomenon when there is a lack of knowledge, and the context of the phenomena is not clear.

There are three reasons to choose a case study in research strategy:

- The case study enables the researcher to study some questions in its natural settings and generate theories from practice.
- The case study enables the researcher to answer "how" and "why" questions, to gain more explicit information.
- The case study enables the researcher to the nature and complexity of the process taking place.

Single-Multiple Case Studies

Case studies can be classified into a single case or multiple cases; a single case provides all the needed information about the research question from one organization. In a single case, information and data from one unit are enough to achieve the aims of the research.

Multiple case studies require data from more than one unit to achieve research objectives. A single case is often used where it represents a critical case or, alternatively, an extreme or unique case. Multiple cases used more than one case to compare whether the findings of the first case occur in other cases. A single case is more relevant if:

1. It is a revelatory case.
2. It represents a critical case for testing a formulated theory.
3. It is a unique case.

On the other hand, multiple cases enable the researchers to study and compare the findings between different cases, and thus explore differences within and between cases, which enables the researchers to forecast the results.

6. Introduction to the Research Design

If you are clear about your research problem, your achievement is worth praising. You have crossed one of the most important and difficult sections of your research journey. Having decided what you want to study, you now need to determine how you are going to conduct your study. There are a number of questions that need to be answered before you can proceed with your journey. What procedures will you adopt to obtain answers to research questions? How will you carry out the tasks needed to complete the different components of the research process? What should you do and what should you not do in the process of undertaking the study? Basically, answers to these questions constitute the core of a research design.

What is a research design?

A research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. The plan is the complete scheme or

programme of the research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data.

A 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.

A research design is a procedural plan that is adopted by the researcher to answer questions validly, objectively, accurately and economically. According to Selltiz, Deutsch and Cook, 'A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure'.

Through a research design you decide for yourself and communicate to others your decisions regarding what study design you propose to use, how you are going to collect information from your respondents, how you are going to select your respondents, how the information you are going to collect is to be analysed and how you are going to communicate your findings. In addition, you will need to detail in your research design the rationale and justification for each decision that shapes your answers to the 'how' of the research journey. In presenting your rationale and justification you need to support them critically from the literature reviewed. You also need to assure yourself and others that the path you have proposed will yield valid and reliable results.

The functions of a research design

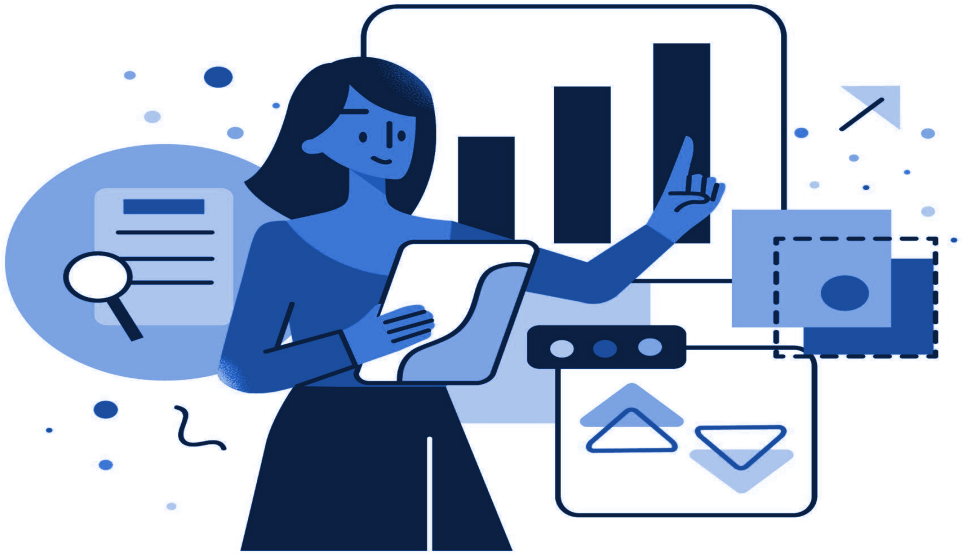
The above definitions suggest that a research design has two main functions. The first relates to the identification and/or development of procedures and logistical arrangements required to undertake a study, and the second emphasises the importance of quality in these procedures to ensure their validity, objectivity and accuracy. Hence, through a research design you:

- conceptualise an operational plan to undertake the various procedures and tasks required to complete your study;
- ensure that these procedures are adequate to obtain valid, objective and accurate answers to the research questions. Kerlinger calls this function the control of variance.

Let us take the first of these functions. The research design should detail for you, your supervisor and other readers all the procedures you plan to use and the tasks you are going to perform to obtain answers to your research questions. One of the most important requirements of a research design is to specify everything clearly so a reader will understand what procedures to follow and how to follow them. A research design, therefore, should do the following:

- Name the study design per se – that is, 'cross-sectional', 'before-and-after', 'comparative', 'control experiment' or 'random control'.
- Provide detailed information about the following aspects of the study:
    - Who will constitute the study population?
    - How will the study population be identified?
    - Will a sample or the whole population be selected?
    - If a sample is selected, how will it be contacted?
    - How will consent be sought?
    - What method of data collection will be used and why?
    - In the case of a questionnaire, where will the responses be returned?
    - How should respondents contact you if they have queries?

7. Data collection within the Research Methodology



INTRODUCTION

The entire research planning, design, and literature review processes converge at the data collection stage. All the critical thinking is a preparation for the actual process of collecting primary data on the topic of the research. Additionally, the researcher must also have the data analysis plan established before planning data collection, and data analysis requires clarity about:

The format of the research instruments

The analyst must guarantee that all classifications of information necessary to examine the objectives are incorporated. In addition, there must be clarity about all aspects that

the research instrument(s) need to analyse, and how qualitative and quantitative items will be handled and analysed during the data analysis stage.

Identify the appropriate statistical technique

The researcher must have a full grasp of the particular statistical strategies that will be used to examine each segment of the exploration instruments. Should inferential statistics be required, the researcher must make sure they understand the procedures and the translation of the significant measurements.

Data layout and presentation

The researcher must select the type of tables and graphics that will be used in presenting the data.

Pilot study

The researcher must test the instruments with a small pilot group, inspecting the ease of use, accuracy, and sufficiency of the information to be used in the actual research study. Anything that needs improvement can then be dealt with prior to commencing the study.

IMPLEMENTING THE PLAN

The data collection plan may not be implementable as a unique or perfect structure, and therefore the researcher must be able to address unexpected possibilities. For example, if access to one of the groups is denied for some unexpected reason. It is thus necessary to have alternate courses of action for every conceivable challenge.

Interaction with participants in the study

The information-gathering plan must aim to encourage positive, informed interaction with the research participants. Prior to the data collection, all respondents are entitled to have all information about the investigation explained to them, including what is expected of them. The researcher must explain what the outcome of the results is for so that the participant can decides if they want to participate in the research. Further, the researcher

must guarantee tension-free participation for the participants and that confidentiality will be maintained.

DATA COLLECTION METHODS

The specific research instrument that is most suitable for the topic should be stated during the research design stage. The two most commonly used primary data collection methods are the questionnaire and the interview. All research is generally concerned with obtaining answers to questions. Data collection instruments:

- Interview
- Questionnaire

The questionnaire and interview are data collection instruments that enable the researcher to pose questions to participants in search of information on the research topic. Each of these instruments has distinct features that enable the researcher to decide which is the correct and appropriate one for the specific data collection purpose.

Appropriate research context

Questionnaires are most widely used in surveys with a descriptive or exploratory purpose. They can, however, also be effectively used in studies with experiment and case study research strategies. The appropriateness of questionnaires as research tools must however be carefully examined in the context of each study. Students sometimes fail to grasp that observation, semi-structured interviews, and other data collection procedures may be more appropriate for their research objectives than questionnaires. Saunders et al. (2003:280) maintained that it is generally good practice not to rely solely on questionnaire data but to use the questionnaire in conjunction with at least one other data collection instrument. For example, a questionnaire designed to establish customers' attitudes can be complemented by in-depth interviews to explore and understand the basis of these attitudes.

Questionnaires

The questionnaire comprises various standardised questions designed to gather the data required. The questions serve to gather the data expected to test your theory. You need to give attention to the reliability of responses and the legitimacy of the discoveries/findings from the research instrument.

8. Approaches to the Data Collection

Differences in the methods of data collection in quantitative and qualitative research

Most methods of data collection can be used in both qualitative and quantitative research. The distinction is mainly due to the restrictions imposed on flexibility, structure, sequential order, depth and freedom that a researcher has in their use during the research process. Quantitative methods favour these restrictions whereas qualitative ones advocate against them. The classification of a method into the quantitative or qualitative category depends upon your answers to the following questions:

- What philosophical epistemology is underpinning your approach to research enquiry?
- How was the information collected?
- Was it through a structured or unstructured/flexible format of data collection?

- Were the questions or issues discussed during data collection predetermined or developed during data collection?
- How was the information you gathered recorded?
- Was it in a descriptive, narrative, categorical, quantitative form or on a scale? How was the information analysed?
- Was it a descriptive, categorical or numerical analysis?
- How do you propose to communicate the findings?
- Do you want to write in a descriptive or analytical manner?

For example, if an observation is recorded in a narrative or descriptive format, it becomes qualitative information, but if it is recorded in categorical form or on a scale, it will be classified as quantitative information. Similarly for data collected through interviews. An unstructured interview, recorded in a descriptive or narrative form, becomes a qualitative method, but in a structured interview, if the information is recorded in response categories or if the categories are developed and quantified out of descriptive responses, it is a quantitative method. Descriptive responses obtained in reply to open-ended questions are all qualitative but if the responses are in numerals they will be considered quantitative. If you develop categories and quantify the categorisation as a part of the analysis of descriptive responses to an open-ended question, it becomes a quantitative analysis. Data generated by focus groups, oral histories, narratives, group interviews is always qualitative in nature.

Major approaches to information gathering

There are two major approaches to gathering information about a situation, person, problem or phenomenon. When you undertake a research study, in most situations, you need to collect the required information; however, sometimes the information required is already available and need only be extracted. Based upon these broad approaches to information gathering, data can be categorised as:

- primary data;
- secondary data.

Information gathered using the first approach is said to be collected from primary sources, whereas the sources used in the second approach are called secondary sources. Examples of primary sources include finding out first-hand the attitudes of a community towards health services, ascertaining the health needs of a community, evaluating a social programme, determining the job satisfaction of the employees of an organisation, and ascertaining the quality of service provided by a worker are examples of information collected from primary sources.

On the other hand, the use of census data to obtain information on the age–sex structure of a population, the use of hospital records to find out the morbidity and mortality patterns of a community, the use of an organisation's records to ascertain its activities, and the collection of data from sources such as articles, journals, magazines, books and periodicals to obtain historical and other types of information, are all classified as secondary sources. In summary, primary sources provide first-hand information and secondary sources provide second-hand data.

9. Introduction to the Research Summary

A research summary is the part of your research paper that describes its findings to the audience in a brief yet concise manner. A well-curated research summary represents you and your knowledge about the information written in the research paper.

While writing a quality research summary, you need to discover and identify the significant points in the research and condense it in a more straightforward form. A research summary is like a doorway that provides access to the structure of a research paper's sections.

Since the purpose of a summary is to give an overview of the topic, methodology, and conclusions employed in a paper, it requires an objective approach. No analysis or criticism.

Research summary or Abstract. What's the Difference?

They're both brief, concise, and give an overview of an aspect of the research paper. So, it's easy to understand why many new researchers get the two confused. However, a research summary and abstract are two very different things with individual purpose. To start with, a research summary is written at the end while the abstract comes at the beginning of a research paper.

A research summary captures the essence of the paper at the end of your document. It focuses on your topic, methods, and findings. More like a TL;DR, if you will.

An abstract, on the other hand, is a description of what your research paper is about. It tells your reader what your topic or hypothesis is, and sets a context around why you have embarked on your research.

Getting Started with a Research Summary

Before you start writing, you need to get insights into your research's content, style, and organization. There are three fundamental areas of a research summary that you should focus on.

1. While deciding the contents of your research summary, you must include a section on its importance as a whole, the techniques, and the tools that were used to formulate the conclusion. Additionally, there needs to be a short but thorough explanation of how the findings of the research paper have a significance.
2. To keep the summary well-organized, try to cover the various sections of the research paper in separate paragraphs. Besides, how the idea of particular factual research came up first must be explained in a separate paragraph.

3. As a general practice worldwide, research summaries are restricted to 300-400 words. However, if you have chosen a lengthy research paper, try not to exceed the word limit of 10% of the entire research paper.

10. Structure of the Research Summary

The research summary is nothing but a concise form of the entire research paper. Therefore, the structure of a summary stays the same as the paper. So, include all the section titles and write a little about them. The structural elements that a research summary must consist of are:

Title

It represents the topic of the research. Try to phrase it so that it includes the key findings or conclusion of the task.

Abstract

The abstract gives a context of the research paper. Unlike the abstract at the beginning of a paper, the abstract here should be very short since you'll be working with a limited word count.

Introduction

This is the most crucial section of a research summary as it helps readers get familiarized with the topic. You should include the definition of your topic, the current state of the investigation, and practical relevance in this part. Additionally, you should present the problem statement, investigative measures, and any hypothesis in this section.

Methodology

This section provides details about the methodology and the methods adopted to conduct the study. You should write a brief description of the surveys, sampling, type of experiments, statistical analysis, and the rationality behind choosing those particular methods.

Results

Create a list of evidence obtained from the various experiments with a primary analysis, conclusions, and interpretations made upon that. In the paper research paper, you will find the results section as the most detailed and lengthy part. Therefore, you must pick up the key elements and wisely decide which elements are worth including and which are worth skipping.

Discussion

This is where you present the interpretation of results in the context of their application. The discussion usually covers results, inferences, and theoretical models explaining the obtained values, key strengths, and limitations. All of these are vital elements that you must include in the summary.

Conclusion

Most research papers merge conclusions with discussions. However, depending upon the instructions, you may have to prepare this as a separate section in your research summary. Usually, the conclusion revisits the hypothesis and provides the details about

the validation or denial of the arguments made in the research paper, based upon how convincing the results were obtained.

11. Tips for the Research Summary (part 1)

The core concept behind undertaking a research summary is to present a simple and clear understanding of your research paper to the reader. The biggest hurdle while doing that is the number of words you have at your disposal. So, follow the steps below to write a research summary that sticks.

1. Read the parent paper thoroughly

You should go through the research paper thoroughly multiple times to ensure that you have a complete understanding of its contents. A 3-stage reading process helps.

a. Scan: In the first read, go through it to get an understanding of its basic concept and methodologies.

b. Read: For the second step, read the article attentively by going through each section, highlighting the key elements, and subsequently listing the topics that you will include in your research summary.

c. Skim: Flip through the article a few more times to study the interpretation of various experimental results, statistical analysis, and application in different contexts.

Sincerely go through different headings and subheadings as it will allow you to understand the underlying concept of each section. You can try reading the introduction and conclusion simultaneously to understand the motive of the task and how obtained results stay fit to the expected outcome.

2. Identify the key elements in different sections

While exploring different sections of an article, you can try finding answers to simple what, why, and how. Below are a few pointers to give you an idea:

Introduction

- What is the research question and how is it addressed?
- Is there a hypothesis in the introductory part?

Methods

- What type of methods are being adopted?
- What is the sample size for data collection and how is it being analyzed?

Results

- What are the most vital findings?
- Do the results support the hypothesis?

Discussion/Conclusion

- What is the final solution to the problem statement?
- What is the explanation for the obtained results?
- What is the drawn inference?

- What are the various limitations of the study?

3. Prepare the first draft

Now that you've listed the key points that the paper tries to demonstrate, you can start writing the summary following the standard structure of a research summary. Just make sure you're not writing statements from the parent research paper verbatim.

Instead, try writing down each section in your own words. This will not only help in avoiding plagiarism but will also show your complete understanding of the subject. Alternatively, you can use a summarizing tool (AI-based summary generators) to shorten the content or summarize the content without disrupting the actual meaning of the article.

Tips for the Research Summary (part 2)

4. Include visuals

One of the best ways to summarize and consolidate a research paper is to provide visuals like graphs, charts, pie diagrams, etc.. Visuals make getting across the facts, the past trends, and the probabilistic figures around a concept much more engaging.

5. Double-check for plagiarism

It can be very tempting to copy-paste a few statements or the entire paragraphs depending upon the clarity of those sections. But it's best to stay away from the practice. Even paraphrasing should be done with utmost care and attention.

6. Religiously follow the word count limit

You need to have strict control while writing different sections of a research summary. In many cases, it has been observed that the research summary and the parent research

paper become the same length. If that happens, it can lead to discrediting of your efforts and research summary itself. Whatever the standard word limit has been imposed, you must observe that carefully.

7. Proofread your research summary multiple times

The process of writing the research summary can be exhausting and tiring. However, you shouldn't allow this to become a reason to skip checking your academic writing several times for mistakes like misspellings, grammar, wordiness, and formatting issues. Your research summary can stand out from the others, provided it is drafted perfectly on both technicality and comprehension parameters.

8. Watch while you write

Keep a keen observation of your writing style. You should use the words very precisely, and in any situation, it should not represent your personal opinions on the topic. You should write the entire research summary in utmost impersonal, precise, factually correct, and evidence-based writing.

9. Ask a friend/colleague to help

Once you are done with the final copy of your research summary, you must ask a friend or colleague to read it. You must test whether your friend or colleague could grasp everything without referring to the parent paper. This will help you in ensuring the clarity of the article.