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INTRODUCTION TO THIS DOCUMENT

Disclaimers
Neither this guide, nor any of the information and requirements contained herein, constitute a contract or create any contractual commitments between Capella University and any student, any prospective student, or any third party. The information and program requirements contained in the Dissertation Manual are subject to change.

Purpose of this Document
This document presents detailed information about each of the Chapters required for a Capella dissertation. Sections of each Chapter are also described. Each section in this document aligns with the Dissertation Template for Quantitative Studies. Carefully read the Chapter Guides so that you can be certain to provide the material that is necessary to successfully write each section of your dissertation.

Consult with your mentor about adding headings that might be necessary to enhance the organizational structure of your dissertation.

Note: You are reporting a study that has already been conducted; therefore you need to write using past tense verbs. You cannot just copy from the research plan without changing the verb tense.

Turnitin
To ensure the originality of your work and the use of appropriate citations, you should submit your dissertation work through Turnitin (TII). TII is a free source-matching tool provided to Capella learners. TII analyzes your examination responses for unintentional plagiarism and improper source referencing. Be sure to allow 24 hours for a response from TII and allow time for editing. If you have questions about using TII, review Capella's Turnitin tutorials. You will find a number of job aids and tutorials. It is especially critical to understand how to interpret your originality report and how to revise plagiarized or matching text. The following resources provide information on interpreting your report and revising:

Additional Resources
- It's Not About the Number: [http://campustools.capella.edu/redirect.aspx?linkid=3944](http://campustools.capella.edu/redirect.aspx?linkid=3944)
- Academic Integrity and Honesty: [3.01.01 Academic Integrity and Honesty](http://campustools.capella.edu/redirect.aspx?linkid=3982)

As you work through your dissertation, you should use the TII source matching tool to check drafts of your work. You may use the draft TII links multiple times to resubmit your paper for analysis as part of your editing process. The previous report will always be replaced by the newer version so it is wise to alternate submitting to Drafts 1–5.

Doctoral Publications Review
Doctoral learners must submit completed dissertations and doctoral capstone abstracts for review by Capella's Doctoral Publications Review team, which monitors to ensure that these deliverables meet Capella's standards for academic writing and ethical research, and that
there is no evidence of plagiarism. It is not the function of the reviewers to revise, edit or proofread the dissertation or doctoral capstone. The reviewers will identify issues needing to be addressed by the learner. Learners are responsible for making required corrections based on the notes from the reviewer, with input and support from their mentor. Reviewers frequently request a second review to ensure that required corrections have been made.

Carefully review the criteria for Doctoral Publications Review. It's important to check your work against these requirements and work with your mentor to ensure you've adhered to these criteria prior to submitting your manuscript for your committee's and school's review. The reviewer will check that you have met requirements in the following key areas:

- Ethical and Legal Requirements
- APA Alignment Requirements
- Dissertation/Capstone Document Requirements
- Writing-Related Requirements

Resources

Writing, Revising & Doctoral Publications Review
https://campus.capella.edu/web/doctoral-programs/research-scholarship/writing-revising-format-editing-review

Doctoral Publications Review Criteria:
http://assets.capella.edu/campus/doctoral-programs/Criteria%20Overview.pdf

Refer to the Ethical and Legal Criteria for Population/Site Anonymity:
CHAPTER 1 INTRODUCTION

All research reports (including dissertations) begin with an introduction describing the problem under investigation and its background, its relevance to the field, and the assumptions and the limitations of the study. This section of the Guide outlines the main sections required in Chapter One. This Chapter One Guide is organized according to the sections found in most dissertations. Each section explains the terminology and identifies the issues that need consideration in that section. As a general guideline, Chapter One is typically 15-20 pages long.

Chapter One should discuss seven specific points: 1) an introduction describing the background of the problem; 2) the statement of the problem; 3) the purpose and significance of the study; 4) the research design; 5) the research questions; (6) the assumptions and limitations of the study; and 7) definitions of terms used in the study. There is also a final section where you will summarize Chapter One and describe the organization and general content of the rest of the dissertation.

Use this Guide to help you write Chapter One. It describes each section to help you ensure that you have covered the necessary material. You are encouraged to refer to your approved Dissertation Research Plan to guide your content for Chapter One.

Before beginning the first section, “Background of the Problem” write an introduction to the chapter that begins directly after the CHAPTER 1. INTRODUCTION heading. The introduction should identify the research topic and the main points of Chapter One. The Dissertation Template provides all of the necessary headings and sections required for your dissertation. It is recommended that you use it for all work.

Background of the Problem

As the first section of your dissertation, you want to begin by providing your reader with a broad base of understanding of the research topic. In “Background of the Problem” the goal is to give the reader an overview of the topic, and its context within the real world, research literature, and theory.

This section articulates the following four main points:

1. What is the general issue of interest to the researcher? In what setting(s) does it occur, and whom does it affect? What are positive and negative aspects of the issue?

2. What did the researcher find in the literature about the issue? What is already known? What are the current best explanations of the problem and its solutions? How strong is the underlying evidence supporting the current explanations and are there problems with those studies? What issues remain to be understood? These questions would be answered only briefly, in summary, form, in this section. They will form the backbone of the discussion in the next section (“Statement of the Problem”). The complete literature review will be presented in Chapter Two.

3. What interests the researcher in choosing this problem on phenomenon for investigation?

4. What general theory is the study going to conduct the research to understand the problem or understand the issue?

This section also should identify the theoretical framework of the study (which will be fully discussed in Chapter Two). This is the basic explanation of the problem currently accepted by the researchers who have been working on the problem. This simply means that one uses an already-accepted account of the wider problem as the framework for considering
new information about the problem. Naturally, like everything in a research design, the theoretical framework needs to be justified. Showing the following will justify the choice of a theoretical framework:

1. Show that all the other design elements are consistent with the theory.
2. Show that the theory is used by other researchers investigating the same or similar kinds of problems.
3. Show that the theory supports the investigation of the problem.

Statement of the Problem

This section focuses on the research problem. The research problem is often referred to as the “gap in the research literature” that your study addresses. It is often stated as something that is unknown or has not been previously researched.

This section should clearly articulate how the study will relate to the current literature. This is done by describing findings from the research literature that define the gap. Typically, researchers will approach this by indicating that previous studies have found “A,” “B,” and “C;” but “D” had not been investigated.

This section need not be lengthy, but should be very clear what the research problem is and why it should be solved.

Researchers needing more information on the general problem and the research problem, see Appendix A.

Purpose of the Study

The purpose of any quantitative research study is to solve the research problem, to fill the gap in the research literature. In this section, you will discuss in more detail how your study will add to the knowledge base.

Focus on solving the general problem and the research problem. To do this, you will need to address both senses of the word “problem.” Essentially, the broad purpose of your study is to help the wider community of interest to investigate an issue it considers important, by means of solving the more narrowly focused research problem. Here, you will lay out your argument that your research problem must be solved (i.e., the gap in the research literature needs to be filled) in order to contribute to the broader knowledge about the problem.

To make that argument, you will refer to the current literature and research evidence, showing how your study takes the next step, fills in an important gap, or corrects a previous mistake or flaw. It is the general purpose of your study to contribute to knowledge about the wider issue, and the specific purpose to solve the research problem. A strong purpose section shows how the transition from the general issue to the research problem is logical.

Significance of the Study

In this section, once again you should keep in mind the problem. Here you also will focus on any other intended audiences or the stakeholders in your study. What will your study offer them?

You will show how your study will be meaningful or valuable to:

- The wider community who have a vested interest in the problem or issue. In the first part of the significance section, you will discuss how important the problem is to
groups in the wider communities. Avoid sentimental statements in favor of using evidence that makes your case. By filling the gap in the research literature, the study created knowledge that can be used by others. When the relevant community is wider, the significance of the study is greater. One should never make claims of wider significance that the study will not deliver.

• The professionals in your discipline who are interested in your problem (as shown by the existence of a body of research relevant to it). Here you focus on the research problem, and the community within your discipline or specialization interested in that. You can also include professionals in another field who may be impacted by your findings. Do not simply assert that your findings will potentially be valuable to professionals in your field--explain why you think so. The surest way to do this is to cite research that calls for the type of study you plan to do.

• The knowledge base and theories of your discipline. Next, you will turn to how important the knowledge generated by solving the research problem is, and explain how the study was an advancement in terms of rigor and how it contributed new information to the knowledge base and theory. Present a justification that the findings make a meaningful contribution to the knowledge base and to the advancement of the theory (or theories) that provide the framework for your research. Make a clear case, supported by relevant sources, that your research increased understanding the research population and relationship among the variables and research population.

Research Questions
In this section, list each research question from your approved Research Plan. Wherever the research questions appear in the dissertation, they must be exactly the same as they appear here.

Researchers needing more information about research questions should see Appendix B.

Definitions of Terms
Identify each variable included in your research questions, and provide a construct, variable, and operational definition of each. For each variable that is connected to a construct, provide a construct definition that is connected to the theoretical framework for the study. Also provide the variable definition, which aligns with the construct definition, as well as the operational definition. Lastly, include the operational definition for each variable. Also, define all of the participant characteristics that characterize your research population (inclusion and exclusion criteria) along with demographic variables you collected in order to describe your sample. This should be written in a glossary format, where the terms are listed in alphabetical order.

Research Design
In this section, identify and describe the methodology, approach, and design that you used to solve the research problem. Include support for why the chosen methodology, approach, and design were appropriate for solving the research problem or addressing the need for the study, and answering the research questions. Provide support that these are appropriate and acceptable for research in your discipline and your research topic. This section is typically 1 page in length.

If you need more information on research design, consult Appendix C.
Assumptions and Limitations

Assumptions

Your study, like all research, necessarily takes many things for granted. In legal terminology, it "stipulates" them. This means that everyone agrees without more ado to accept them as true without going through the tedious business of proving them to be true. But this acceptance does not mean that assumptions must not be defended; like every other element of your dissertation, they must have some support.

Two issues must be addressed about your assumptions: (a) Where do they come from? (b) How far down the "chain of assumptions" must you go in identifying them and supporting them?

Where do assumptions come from? There are a number of sources of your assumptions. We can list them as general methodological assumptions, theoretical assumptions, topic-specific assumptions, and assumptions about measures.

General methodological assumptions

First, in any methodology, generations of methodologists before you have done the tedious work of identifying some important and basic assumptions one must make to do the kind of research you are setting out to do. For instance, you must assume participants will answer questions truthfully. This and many similar assumptions are "universal research assumptions" and you will find them in the advanced methodology articles devoted to your particular study's methodology. Your particular design and sample may imply certain assumptions as well. For instance, you might have to assume that they can read at a certain specified level in order to answer your questionnaire. Think carefully about all elements of your design to make sure you understand what you are assuming or taking for granted by using them.

In general, all methodologies make a number of critically important assumptions about the nature of reality (ontology) and the nature of knowledge (epistemology) which you need to be familiar with and to identify in your prospectus. These fall into the following categories:

- Ontology: Is reality a single phenomenon, or are there multiple realities? (Most quantitative studies assume that reality, measured in units, is the same for everyone; qualitative studies assume that one person’s reality may be independent, socially constructed, or different from another person’s reality).
- Epistemology: Are the knower (researcher) and the known (participants and data) dependent or independent? (Most quantitative researchers assume them to be entirely or nearly entirely independent; how the researcher feels or believes is irrelevant to the outcome of a measurement.)
- Axiology: Should research and researchers be value-laden or value-free? (Quantitative work assumes a degree of "value-freedom." But this is an important assumption to critique as you prepare this section.)
- Generalizations: Is it possible to infer things about one group from knowledge about another? (Quantitative procedures set stringent rules for generalization.)
- Causality: Do causes exist separately from their effects, preceding them temporally, or are causes and effects circular and mutually influential? (Quantitative research focuses on the degree to which causal inferences can be made in a study.)
- Logic: Is it better to search for principles from which to deduce predictions (theory), or to gather numerous facts and infer meanings from observations? (Many texts...
make the broad claim that quantitative analysis is deductive. This is not so clear in practice, where some of the best quantitative analysis is a mix of inductive and deductive (sometimes called the "hypothetico-deductive method.")

When you select a quantitative methodological stance, your assumptions tend to be positivist. Become familiar with the assumptive sets underlying this intellectual position, so that you can defend it as appropriate to your research question and articulate, at least, its overall description.

**Theoretical assumptions**

Next, your theoretical framework (see the Chapter Two for a full discussion of the "theoretical framework") carries with it many particular assumptions. Some of them will bear on your study, and you will need to identify them.

**Topic-specific assumptions**

Additionally, the previous research and literature on your topic may reveal other topic-specific assumptions made by researchers in your field.

**Assumptions about measures**

Finally, there may be important assumptions built into the measures you are going to use; if so, they should be discussed. When using standardized tests, for instance, it is assumed that standard administration protocols will be followed by all testers, that the participants will appropriately resemble the norm groups for the measures, and so on. If there is any deviation from those assumptions, they profoundly threaten the validity of the study. As such, these assumptions should always be clarified, and reference to the methods section (Chapter Two) of the dissertation should be made, where the conformity of the sample with the assumptions can be discussed in detail.

When specifying your assumptions, particularly the major ones, you should refer to literature where those assumptions are established or where they are simply "stipulated" by earlier researchers. Any assumptions (indeed, any design element) that have been accepted in a peer reviewed journal article can fairly safely be made in a dissertation. By convention, the stopping point is usually described when you have named the main assumptions you are making about these elements:

- Your methodological stance?
- Your theoretical framework's main assumptions about the subject matter.
- The main assumptions about your subject matter shared by the previous researchers whose work you are relying on.
- Assumptions germane to the proper use of your measures or methods of data collection.

**Limitations**

In addition to the study's assumptions, Chapter One also discusses its limitations. There are basically two forms of limitations you must discuss. The first group comprises any important issues regarding your research problem which for one reason or another you are not going to investigate. The second group contains elements of the study that limit its power, validity, or credibility, its capacity for generalization, and so on. In other words, limitations in the design.
**Design limitations.**

Limitations that arise from flaws the nature of the design need to be considered carefully. In this section, address the limitations of the methodology, approach, and design you used for your research. (Note that in Chapter Five, you will more thoroughly discuss these and more specific limitations that may have happened during the process of actually performing the research, such as not getting a large enough sample. Here in Chapter One, focus more on the design of the research and its limitations.)

The two main criteria for allowing a limitation to stand are these: (a) The design does not prevent you from doing a study that validly answers the research question and solves your research problem appropriately and relevantly; (b) the design neither impairs your ability to draw necessary conclusions nor renders those conclusions suspect.

**Delimitations (intentional areas not investigated).**

There is a second class of limitations: things that an educated or expert reader might expect your study to investigate that you are not going to investigate. Put generally, these limitations are "things the study did not investigate." ("Things the study did not investigate" are often called delimitations, because they create artificial boundaries, they delimit, your study's focus.) To identify such delimitations, you will usually rely on two main sources: your literature review of the general problem and your theoretical orientation.

**Organization of the Remainder of the Study**

In this section, briefly, summarize the contents of Chapter One, and then give the reader an overview of the content of the remaining four chapters.
CHAPTER 2. LITERATURE REVIEW

All research reports, including dissertations, contain reviews of the research and scholarly literature about their topics. The main purpose of the literature review is to inform the reader what is known about your research topic, both in terms of research findings and theory.

This section of the Guide describes the main sections required in Chapter Two. Chapter Two should discuss five specific points: 1) the methods or procedures you used to search for sources; 2) the theoretical framework(s) or orientations you used for the study; 3) the actual review of the research literature; 4) a synthesis of the findings presented in the review; and 5) a critique of the research methods and procedures used in the sources in the literature review.

As a general rule, literature reviews for dissertations should be comprehensive and rigorous meaning that you have included all of the relevant published research and scholarly sources in your literature review. It is expected that your literature review is comprised of a majority of primary sources from your discipline. In addition, some schools request that you only utilize articles that are more recent, within the past five to seven years; however, in other schools, if you demonstrate the information is relevant to your study, the age of the article is not an issue. If you have a question about an article, contact your mentor.

Depending upon your research topic, literature reviews will range in the number of resources and the length of the chapter. For example, many dissertation literature reviews include 75 to 200 sources and the average number of pages is in the mid thirties. The key to a good literature review is read until you reach a point of saturation. In other words, you have exhausted the literature concerning your topic and then, write the number of pages required to succinctly support your topic. As a guideline, literature reviews should approximate 25 pages in length.

Before beginning with the first section, “Methods of Searching,” write an introduction to Chapter Two that identifies the main content you will cover in the chapter.

Methods of Searching

This section describes the process of how you found the sources that you used for your literature review. Make sure to identify all of the databases you used, as well as search terms. Explain how you might have combined search terms, or used other search procedures, such as limiting searches to certain types of publications. If you used databases to find instruments for data collection, make sure to include that.

Theoretical Orientation for the Study

In this section of the literature review, cite the major references to support your theoretical orientation and briefly describe the orientation. Essentially, the "theoretical orientation" or framework is the scientific perspective from which one conducts the research. Do not blur or blend theoretical frameworks unless they can be authentically integrated and are needed to support the study. In that case, a careful description of all the relevant theories in terms of their major references will be written.

*Note: The following paragraph does not apply to the School of Education, which does not allow use of more than one theoretical framework.

When you intend to use more than one theoretical framework, you need to synthesize and integrate the different theories carefully. You must show how the concepts work together and can be validly considered together. In this sense, your "theoretical framework” can comprise a number of different theories, but be sure that they—or the constructs you borrow from them—are compatible (deal with the same material).
You may wish to use relevant APA style sub-headings in this section to organize your material.

As a general guideline, this section is typically 2-4 pages long.

**Review of the Literature**

Begin this section with an introduction which states the overall topic of the dissertation and provides an orienting paragraph or two, so the reader knows what the literature review is going to do. Describe how the section will be organized (what are the main points and in what order do they appear?).

The manner in which the “Review of the Literature” is organized is important. It can be organized by variables, by factors, by themes, historically or constructs to be addressed, by elements of the theoretical framework, by elements of the research design, or by another principle. Use APA style sub-headings to organize the main topics covered in this section. The flow of this section should be apparent to your readers. All literature review sections follow some "logic," namely a method of organizing the main points so that they flow logically and support one another. To that end, you must show that your research is a logical development out of the previous research.

When writing the literature review, do not simply string one study after another, even if they are well summarized and evaluated. Follow your organizing principle. For instance, in a quantitative dissertation, a common organizing principle is to address each of the main variables in the study in order (independent variable, dependent variable, other relevant variables, and so on). There will also be literature reviewed to support the methodological choices made in designing the study - quantitative vs. qualitative, types of measures, the appropriateness of tests and measures to the subject, and so on. In essence, this section of the literature review - in course papers as well as in dissertations - shows the research from which the key elements of the study or paper have been drawn. Even though your dissertation is quantitative, the review of literature should review and present all of the relevant qualitative and quantitative studies found the topic in the literature. By following your chosen organizing principle or logic, you will help your reader to follow the flow of your own thinking about how you approach the study and its elements.

Whatever organizing principle you choose, follow it strictly, and use section sub-headings to keep the reader oriented. Each section or sub-section should support a conclusion or theme bearing on your overall answer, solution, or argument.

This section is typically 25 pages in length.

**Synthesis of the Research Findings**

This is where you pull together the findings and discuss the larger themes, inconsistencies, or relevant patterns based on the research studies you evaluated, within the context of the theoretical framework. Note that this is not merely a summary of the literature. You should present something new here that describes the bigger picture of the literature. In general, here is where your reader will see what the literature leads you to conclude about your own study; it also sets the stage for a discussion of the research methods in detail (Chapter Three).

This section will summarize the main points of Chapter Two, showing both the strengths and the weaknesses in your theoretical orientation and your project's relationship with the previous research on the topic, both in content (research findings) and methods (methodology).

This section is typically 3-4 pages long.
Critique of the Previous Research Methods

In this section, you examine the quality of the research you have reviewed. What are the methodological strengths and limitations of the works you reviewed? How do those weaknesses, in particular, support your theoretical framework? You will be considering things such a rigor of designs, sampling errors, size of samples, quality of research instruments, appropriateness of statistical procedures, and any other issues related to the quality of research.

Here too is where you may bring up the opposing viewpoints, disconfirming evidence, or counterarguments to your main points. These can be discussed in conjunction with earlier sections if you prefer; it is recommended that you clearly identify sub-sections dealing with contrary opinions, evidence, or views, so that your readers will be fully informed both (a) that you did your literature review well and (b) understand all sides of the issue. It will be very important, when you describe your final theoretical framework, to explain why you abandoned any contrary evidence or adopted one viewpoint on a debate rather than another.

What if there is no controversy about your subject? (Be certain that is the case before asserting it.) In that case, show the methods you used to comb the literature (including related literature in closely-related fields) so that the readers can judge whether your claim (that there is no controversy) is well founded.

At the end of this section, you should have constructed a strong case for why your study will be a step forward in terms of research rigor.

This section is typically 2-4 pages long.

Summary

This should not be more than a page, and in general, will summarize the conclusions you have drawn from the previous literature on your topic or methodology which support your own project. This is of great importance in the dissertation, where this section sums up Chapter Two and provides a transition into Chapter Three.
CHAPTER 3. METHODOLOGY

Every research paper, including the dissertation, has a section describing how the researcher actually carried out the study itself. In Chapter Three, you will describe step-by-step the methods and procedures used in your study in a way that will enable future researchers to replicate your study. In fact, make this a working principle to follow in writing Chapter Three: Describe your steps clearly enough that a reader could follow them like a recipe and reasonably repeat what you did. A key skill that will help you is to read your work with the mind of a stranger; this will highlight details that you may have forgotten to describe.

Some of the sections in Chapter Three mirror sections in Chapter One. Do not simply copy and paste your text from Chapter One here. Instead, rewrite them with a new emphasis. Chapter One is a conceptual and introductory presentation where you focused on the nature of your study. For instance, your focus in Chapter One on the research question was how it fit with the research problem. Here in Chapter Three, your emphasis is on methods and procedures, so when you discuss the research question, you will focus on the kinds of data the question requires for its answer, among other things, and how your instruments and procedures are designed to collect and analyze those kinds of data. While the actual wording of the research question(s) should be the same, the surrounding discussion will vary in emphasis.

In short, Chapter One describes why the research question is being asked, and Chapter Three describes how the research question was answered.

Chapter Three has at least the following elements, which will form the structure of this Guide as well: 1) the purpose of the study; 2) the research question(s) and hypotheses; 2) the research design; 3) the target population and participant selection; 4) the procedures you used to conduct the study; 5) the instruments used to collect the data; and 8) ethical considerations. The final section of Chapter Three is the chapter summary.

Before beginning with the first section, "Purpose of the Study," write an introduction to Chapter Three that identifies the main content you will be covering.

Purpose of the Study

This section re-presents in a more abbreviated fashion the information given in the opening sections of Chapter One: the research problem, any background relevant to the methods, the research questions, and what the study is meant to accomplish—that is, its purpose. The objective is to reorient the readers so that the methods to be described here will make sense.

Pay attention to two things:

- First, remember to make the distinction between the general problem and research problem. Some studies explicitly propose to contribute to solving the general problem or wider need for the study by generating new knowledge. It is important to be clear about what your data and findings are capable of, and what you designed your study actually to do.

- The second thing to pay attention to in writing this section is scholarly modesty. As in everything, claim for your results only what they actually can support, and be satisfied with a well-stated purpose even if it is not grand. Not many dissertations provide the final solution to a vexing issue. Most, indeed, are modest achievements, advancing the knowledge in the learner’s chosen area one useful and important step
along what usually is a very long road. In writing your study’s purpose, focus on solving at least the research problem by generating new knowledge and (if the study can do it) helping to address the general issue, but don’t claim more than it actually can do.

Keep in mind that in Chapter One the issues are discussed conceptually, in terms of the theoretical framework for the study. Here, they are discussed in terms of methods and procedures for answering the research question.

In this section, although you do want to cover what you have earlier said in Chapter One, you should not merely copy-and-paste relevant passages. Rewrite them, usually in greater detail. The key principle is to write such that readers will be prepared both to critique the methods and if desired, to be able to repeat them.

However, without contradicting the above principle, repeat verbatim important and recurring technical terms (such as your variables and constructs), relevant formulations (such as key descriptors or the names of your main theoretical framework concepts and the statement of the purpose of the study), or frequently-used “code phrases” which quickly tell your readers what you are referring to (such as referring to your study as a “two-group pretest-posttest quasi-experimental design”). Keep all key terms consistent so your readers always know exactly what you are referring to.

It is perfectly legitimate to paraphrase a previous passage very closely. As always in scholarly writing, guide your readers to the original material in case they want to review it. Whenever borrowing from an earlier passage, refer back to the place from which you are borrowing. Conventional APA in-text citation (author, year and a later reference) is not used for this because the earlier passage (your earlier chapter) is not yet published material. For example, you could write “As described previously (see pp. 9-11), the design of this study will be . . .”; or you might write something like, “Pages 9-11 in Chapter One described the design of the study. Here, that material will be repeated but with significantly more detail.” How you actually reference the earlier material is up to you, as always, but help your readers by reminding them where the original material comes from.

Research Questions and Hypotheses

Present your research questions again. These must be exactly the same as what you presented in Chapter One. Beneath each research question, present the alternative (or research) hypothesis and corresponding null hypothesis for that question.

Research Design

Like the previous section, you already outlined this in Chapter One from a conceptual standpoint. Here you can repeat (rewritten, as above) much of that material for the readers’ convenience, adding in greater clarity and detail, but your focus must be concrete description of your design. In this section, you want your reader to have a clear idea of how your design was used to answer the research question(s). Again, the aim is to create a step-by-step recipe to support possible replication in the future.

Note: School of Education learners should include the guide (e.g., text book, monograph, peer-reviewed journal article) that they are following.

In preparing Chapter One, you will have given much thought to the strengths and weaknesses of your design, and by now you should have revised and enhanced the design wherever feasible and realistic to eliminate as many weaknesses as possible. Now, the research design section in Chapter Three will both describe your design in detail, and
discuss the strengths and weaknesses of the design, incorporating all the most recent design changes that improved it and reduced the threats to internal and external validity.

It is a very good idea to include your design diagram in this section and to use it to guide your readers to a full understanding of your design. (Creating the design diagram is discussed in Appendix C.) Also, explicitly name your variables, and whether they are independent, dependent, predictor, or outcome variables, as relevant to your study.

**Target Population and Sample**

In this section, again, you will expand on information presented more cursorily in Chapter One. Before getting into details, please refresh your memory about the differences between the population and the sample. For this discussion, we’re going to use the terms to refer to people. Statisticians use the terms to refer to groups of data, not people because we work with and analyze data, not actual persons. But because the data refer back to people, more loosely the terms often refer to the people from whom the data (numbers in the statistical world) come from. In that sense, the population is the larger group of people who experience the general problem or issue that generates the need for the study.

This section should have the following sub-headings: “Population,” “Sample,” and “Power Analysis.” Remember to include a paragraph between the “Target Population and Participant Selection” and “Population” headings that introduce the reader to the larger section and its contents.

**Population**

In this section, you will describe the characteristics of the population. In statistical work, these characteristics include both the actual features that define the population and the (assumed but unknown) statistical parameters of the population, which are assumed for the study to be similar to the actual parameters you discover in the sample. (Remember that we are speaking loosely here—“parameters of the population” strictly speaking means statistics describing data, not people.) Describe the characteristics of the population as well as relevant population statistics (parameters). Report the most current known demographics describing the population. At a minimum, you need to describe the gender, age, and race/ethnicity breakdown of the population. Depending on your topic, you may need other demographics such as level of education, socioeconomic status, and so on.

**Sample**

Next, describe the sample, consistently with the description of the population. This means simply that the researcher specifies the features of the sample that reflect the larger population. Representativeness is a key issue.

If you utilized a sampling frame for your research, you must describe it in this section, along with known demographic information.

Carefully describe the inclusion and exclusion criteria for your sample. Note that exclusion criteria are not merely the “opposite” of inclusion criteria. Exclusion criteria are those characteristics that would disqualify and otherwise qualified person from participating.

Do not describe the actual obtained sample in this section. For example, you do not want to report your obtained sample size, how many males and females you had, and so on. The actual description of your obtained sample is presented in Chapter Four.
For researchers needing more information on describing the population and sample in this chapter, see Appendix D.

**Power Analysis**

Describe the estimated size of your sample next. This subject requires careful thought and study of relevant statistical texts. Statistical calculations have various requirements for the sample size, and you need to be familiar with them. In your dissertation, you should stay within conventional practices (using sample sizes adequate to the kind of analysis you plan to do), unless you have a very strong rationale to depart from the conventional practice supported either by relevant methodological literature or by empirical studies. Here, you should discuss how you arrived at the estimated sample size. For example, if you performed one or more power analyses, describe their results. If you consulted a statistics text, describe how the recommendations there match the characteristics of your data and statistics.

Support your arguments with references to methodological articles relevant to the issue and your topic and to empirical studies which have paved the way for you to follow. Note that “methodological articles relevant to the issue” are not general textbooks.

**Procedures**

The terms methods and procedures mean different things. Methods mean the general term describing what you will do to accomplish the task at hand. Procedures, on the other hand, are step-by-step descriptions of how the methods will be carried out.

The procedures section describes the procedures that will be used to carry out all the major methods of the study. Usually, the methods are clustered in these main groups: methods of sampling; methods of ensuring protection of the participants and their rights; methods of data collection; and methods of data analysis. Each of these groups of methods has procedures for implementation and should be presented under separate headings in this section. Make sure to provide an introductory paragraph to the Procedures section before presenting the first heading, “Participant Selection.” Subsequent headings are “Protection of Participants,” “Data Collection,” and “Data Analysis.”

**Participant Selection**

Before moving ahead, let’s be clear about the distinction between “methods” and “procedures.” Purposive (purposeful) sampling (or random sampling, etc.) would be a method. In describing how you plan to carry out that method, you describe your procedures. So simply saying that you will obtain a sample by doing “snowball sampling” still requires you to describe what steps you will take to accomplish that.

In this section, identify the sampling method and describe the procedure of how you selected the sample. Include your steps taken for recruitment of participants. Any text on research methods and design will list the various kinds of sampling procedures to use (e.g., random, stratified, cluster, purposive, snowball, etc.). Please use standard terminology throughout the dissertation, and be consistent. Be sure your terminology is congruent with your methodology and approach. For instance, in quantitative analysis, one does not typically use purposive sampling techniques, which are associated with qualitative analysis. However, if you used a non-conventional technique or procedure, in this section you should detail it and discuss the rationale and how the procedure or technique is consistent with your research question and design (with references to support the technique).
After describing your method of sampling, you describe your procedures for carrying that method out. Describe carefully all the steps you took to create your sample. Each procedure—identifying potential participants, contacting that pool, recruiting or inviting their participation, and organizing your sample—requires its own procedural description (a recipe clear enough that others can reasonably repeat your work). In this section, “organizing the sample” includes a variety of steps, including how the inclusion and exclusion variables or criteria were measured or identified and how the participants were assigned to groups (if that happened in your study) after they were accepted into the sample.

Some of the details that must be included in this section are the recruitment site (de-identified to protect participant confidentiality), how potential participants contacted you to indicate their willingness to participate, how the participants were screened to make sure they met the inclusion criteria, but not exclusion criteria, and how you proceeded once eligibility was determined. The sampling procedure ends once the participant provides informed consent.

All this must be described in this section.

**Protection of Participants**

In this section, describe the procedures used to protect the participants, such as how informed consent was obtained, whether there might have been safeguards in place in case of re-traumatization or to protect vulnerable populations and so on.

**Resources**

Ethical and Legal Criteria for Population/Site Anonymity:

**Data Collection**

Data collection typically begins once informed consent has been given. Describe in detail what participants did in order to participate in the study. Where were they? In what order did things happen? About how long did it take for a participant to complete the study? You might try putting yourself in a participant’s place and ask yourself what you would do as a participant in your study. If you did a study where you manipulated an independent variable (either an experiment or quasi-experiment), make sure to describe how the procedure was different for the different groups in your study. The detail in this section should be such that another researcher could reasonably replicate your study.

This section should also include descriptions of how you stored and protected the data, as well as your plans for destroying the data in the future.

**Data Analysis**

This section describes the procedures you used to analyze your data. Do not report your data in this section. You will do this in Chapter Four. This section describes how you analyzed the data, and Chapter Four describes the findings as a result of the data analysis.

Recall “methods and procedures.” Finding correlations is a “method.” What procedures will be used to carry out that method? Before you work out the correlation coefficient itself, you must do the descriptive statistics. Which ones will you analyze? After you decide that, you’ll need to decide which correlation method you will use (Pearson’s r, Spearman’s rho, the phi coefficient, point-biserial correlations, others?). Then, if you intend to further test your correlation for statistical significance (and why would you not?), you must decide which method for doing so you must use. And if you are performing a series of comparisons of two groups (for example), you may go on to do further analyses of the comparisons of those two outcomes. As you know, the answers to all these questions depend on the types of data
your instruments generate for you, and different instruments will generate different kinds of data.

There is a logic to the “procedures” you’ll follow in doing your data analysis. That might look like this:

- First, determine the types of data involved in each separate statistic and correlation (etc.) you will do.
- Next, determine the descriptive statistics required or desired, including both descriptive statistics and graphical summaries (diagrams, histograms, scattergrams, etc.)
- Next, determine the sequence of methods for the desired analysis. Remember, there usually are separate analyses carried out sequentially to answer your research question.

Then describe how you will carry out each step. For example, it is inadequate to write, “The data were examined for correlations using Pearson’s r.” Instead, identify the sequence of analyses or calculations you will perform. “After the data were entered in a data table based on an Excel spreadsheet, identifying the variables as follows . . . , then the scores were transformed to standard scores. Following this . . .”

Read your description with a skeptical eye: does it tell enough detail that your reader could follow it like a recipe? For example, if you plan to use a MS Excel spreadsheet or a statistical software program such as IBM SPSS or Minitab, what version? What features or special elements will you make use of, if any? Try to leave nothing for your readers to guess at.

In order to organize your material within the Data Analysis section, you need three subheadings: “Descriptive Statistics,” “Hypothesis Testing,” and “Post-hoc Analysis (-es).”

**Descriptive Statistics**

The Descriptive Statistics section indicates which descriptive statistics you used for your variables in your research questions, as well as the descriptive statistics used to describe your sample. If you needed to transform any variables, describe the data transformation; for example, if you converted raw scores to z scores.

**Hypothesis Testing**

The Hypothesis Testing section explains the inferential statistics you used to test each hypothesis accompanying each research question. Include how you tested for the assumptions of each statistical test. Make sure that you provide a rationale for the tests you chose, supported by the methodological literature. Identify the statistical software program you used to analyze your data.

**Post Hoc Analysis**

In the Post-hoc Analysis (or Analyses, if you had more than one), describe the conditions under which you used post-hoc analyses, which post-hoc tests you used and why. If you did not perform any post hoc analyses, omit this section.

In the Data Analysis section, include a table similar to that in Section 5.9 (Data Analysis) of your Dissertation Research Plan. Omit the “Post hoc Analysis” column if your study did not require the use of post hoc tests to test the hypothesis.
(Note: Post hoc test and post hoc analysis may refer to different things depending on the source. In this Guide, a post hoc test is used to refer to a test that is done after an omnibus test. For example, if an analysis of variance (ANOVA) to test for significance among 3 or more groups was significant, you would need to use a post hoc test (e.g., a Tukey’s HSD) to determine which pairwise comparison of group means were significantly different. A post hoc analysis, in this Guide, refers to any analyses you might have done that did not address a research question—something extra that you did because you might have noted something interesting in the data you obtained, or because the answers to research questions led you to ask something additional about the data. Post hoc analyses are not required.)

**Instruments**

This section features any instruments you will use to collect data of any kind. For its purposes, consider the term instrument broadly. A questionnaire is an instrument, as is a standardized psychological test. In some studies, there might be actual instruments (cameras, tape recording devices, biofeedback equipment, and the like) collecting data. Make a list of each and every instrument that you will use in the collection of data.

In writing this section and its subsections, discuss the instruments in the order in which they will be used in the study itself. The first subsections of the section will describe each instrument in detail (one subsection per instrument). If the IRB directed you to perform a field test, make sure to describe the field testing in this section.

There are two major goals for this section. The first is to make it possible for your readers to find these instruments and to use them again in a replication or other type of study. To that end, provide complete references to their original publication (using standard APA citation [author, year] in the text and references in the Reference List), brand or product specifications (including where the instruments were purchased or rented), or other identifying information. The second goal is to indicate clearly how valid and reliable the instrument is for your purposes. Here, be sure you show how the instrument is appropriate both for getting the kind of data you need to answer your research question and for the population you are investigating. For example, many tests have published validity and reliability data and information about the population for which it was normed, which you should report in this subsection. Some instruments do not have published validity or norming data or are not in that kind of category at all.

But even when there are no published data about the instrument or it is of a kind (e.g., biofeedback or fMRI machinery) which does not admit of standard validity and reliability coefficients, keep the major goals in mind. Describe each instrument's fitness to obtain the kind of data you need to answer your research question and its appropriateness for your population of interest.

Within the Instruments section, you need a heading using the full name of each instrument, as well as sub-headings for “Validity” and “Reliability.”

**Heading Title (Name of your instrument is the actual heading)**

Describe the instrument fully, including the types of questions, scoring, range of score, sub-scales, type of data generated by the scores, and a justification as to why you chose the instrument to measure a particular variable. Indicate how you obtained permission to use the instrument (such as obtaining it directly from the instrument’s author), whether it is considered public domain, or if permission was granted upon purchase of the instrument. If certain qualifications are required to administer the instrument, address those and indicate how you were qualified to administer the instruments.
Validity
In the validity section, describe the manner in which the instrument was validated, and include all validity coefficients.

Reliability
Likewise for the reliability section, describe the manner in which reliability was established and include validity coefficients. Evaluate whether the instrument has sufficient validity and reliability. Make sure to include proper citations. Repeat this format and these three headings for each instrument you used.

To summarize your variables, provide a table similar to the one in Section 5.6 (Types of Data) in the Dissertation Research Plan. Add a column with the heading “Instrument” and indicate the name of the instrument (and scale if applicable) used to collect the data for each variable.

Do not include copies of published assessments or permissions to use them in your dissertation’s appendices.

Ethical Considerations
In this section, discuss the ethical considerations you addressed in your study. You can mention the procedures you covered in the Protection of Participants section earlier in the chapter, but here explain fully why you might have taken certain steps. For example, if your sample was considered to be vulnerable, explain why you chose certain safeguards to protect your sample. If you had any conflicts of interest, disclose those in this section and explain what you did to mitigate those. In this section, indicate that your dissertation research received review and approval from the Capella University IRB, as well as any other IRBs or agencies that might have approved your study.

Resource
Refer to the Ethical and Legal Criteria for Population/Site Anonymity https://assets.capella.edu/campus/doctoral-programs/DoctoralPublicationGuidelines.pdf

Summary
Summarize the main points of Chapter Three and provide a transition to Chapter Four.
CHAPTER 4. RESULTS

Background to the Description of Chapter Four

In Chapter One, you described your basic research subject and the research problem: its importance, the research design you created to solve it, and your assumptions and limitations. Then, in Chapter Two (the literature review), you showed your theoretical framework—how you found and developed your topic and the specific research problem and question from the existing research literature, and how you selected your design elements by analyzing the methodological literature. In Chapter Three, you described step-by-step the methods and procedures used for data collection and analysis. Every research paper, including the dissertation, has a section describing the results of the data analysis, a presentation of the data that were analyzed, and the findings or results of the study. Capella’s approach to the dissertation provides that information in Chapter Four.

Chapter Four presents a non-evaluative reporting of the data, supported by tables, figures, and charts where applicable. Quantitative studies are typically guided by hypotheses or research questions, and so the data are typically reported relative to each hypothesis or research question.

In the results chapter, review the collected data and explain the statistical analysis you performed on them. Usually, the Chapter begins with a summary of the primary results of the study and then proceeds to describe the data in enough detail to demonstrate the credibility and validity of the conclusions. Tables or figures often provide the most efficient and effective means of communicating the data, but they should always be clearly referenced by title and explained in the body of the chapter so that readers can easily identify and understand them.

This chapter will vary considerably in size and detail according to the research methods used. If for example, the study reports the results of an empirical survey, most of the data will exist in the form of tables.

The writing style should be as simple, concise, and clear as possible; many results chapters become complex by nature because they present the results of multiple complex analyses. The writing should not add to the complexity. Think through the logical order required by the research question, and present the results of the analyses in the way that will best allow a clear answer to the research problem.

Chapter Four has the following sections: 1) description of the sample, 2) hypothesis testing, 3) summary of the hypothesis testing, and 4) post-hoc analyses (if performed). The Chapter ends with a summary.

Although this may seem the logical place to do so, this section is not the place to discuss limitations or problems with the sample, unless they bear directly on the data analysis. In general, those topics are better placed in Chapter Five. It is important to keep the distinction between “analysis and results” and “discussion” clearly in mind throughout Chapter Four.

Start Chapter Four with an introduction to the chapter that states the purpose of the chapter, describes the organization or main sections of the chapter, and explains how Chapter Four fits into the overall dissertation. This introduction should set the stage for the remainder of the chapter, as well as allow the reader to gain an understanding of the logical flow of how this chapter relates to both the preceding chapters and the following chapter.
Information about the research design, methodological assumptions, or any other material covered previously in Chapters One, Two, or Three should not be included in this Introduction. The key thing to remember: this introduces Chapter Four, not the entire dissertation. It is appropriate to restate the research question and hypotheses, because in essence Chapter Four presents the analyses which provide the answer to the research question, usually by accepting or rejecting the hypotheses.

**Description of the Sample**

The “Description of the Sample” section of Chapter Four consists of a detailed description of the participant sample actually used in the study. Report the size and power of the sample. This is not the place to evaluate or to discuss implications of either the size or the power; Chapter Four simply describes the results as clearly and concisely as possible. (Chapter Five will discuss what the sample size and power might mean for the results, as well as for the larger question of this study’s relationship to the previous literature.)

After discussing size and power, next is the demographic description of the sample. The demographic description should focus entirely on statistical or statistically related information, related concisely to the sample characteristics listed in Chapter Three.

In quantitative research, where external validity (generalization) is typically an objective, describe the sample at the level required by the statistical analyses. Quantitative analysis involves the identification/recognition of the unit of analysis. This unit of analysis can be at the individual, group, organization, or industry level. Descriptive statistics would thus represent the unit of analysis. Thus, descriptive statistics are the usual way to describe the sample. Specific characteristics occurring within the sample (e.g., gender, race, socioeconomic status, and so on) are also described, as long as they are related directly to the characteristics of the sample outlined in the earlier chapters.

Do not introduce new sample characteristics in Chapter Four if they were not described as important in Chapters One or Three. Leave new descriptive data out of Chapter Four unless there is a clear and meaningful reason for including them. If a researcher found such characteristics in the sample, they might be considered “unexpected findings” and reported in a sub-section of the “Descriptive Statistics” section.

Be certain to include all descriptive information regarding the participants that is pertinent to the study itself, and leave out the rest. While most descriptions of the sample(s) will include such information as age, gender, ethnicity, educational status, and area of residence, some studies—due to the nature of the research question—might include additional information. Include enough detail about the participant sample to support the later presentation of the answers to the research question(s) and to allow following researchers to replicate your study and, you hope, your findings.

It is important while offering the reader a detailed description of the sample, also to carefully maintain the confidentiality and to conceal the identities of the individual participants in the study. It is essential that the participants not be identifiable by any individual reading the manuscript. Be careful not to allow details of setting or context to identify inadvertently any of the participants.

For example, describing participants as “graduate students in psychology at a local online university” could potentially identify the participants if the meaning of “local” became known somehow (the researcher’s locality may be known) and if there were only one such online psychology department or university in that locality. In contrast, information that the participants are “graduate students in an online graduate program,” if that fact is important
in understanding the results, would not unduly risk revealing the participant’s identity because there are many "online graduate programs."

Include other information about your sample (again, not about individuals within the sample) which bears on your research question and the analysis to be reported. However, keep the focus on statistical information, because this is a quantitative analysis. This section also should describe such things as the original number of participants invited to participate or the sampling frame size, the actual response rate, the number of participants who withdrew during some phase of the study, and any similar information bearing on the analysis of the data. You will evaluate and discuss such information for its implications in Chapter Five; here in Chapter Four, simply report the facts. For example, a surprisingly low response rate to a survey, even if there were enough participants, could draw attention to something in the survey design that prevented completions, an important point to discuss later, in Chapter Five. Here you would simply report the response rate.

Finally, describe any other aspects of or influences on the sample participants and their participation that might bear on the findings. These could include, for example, partially completed protocols or missing data, uncontrollable deviations from the planned interactions with the participants, happenings in the context or setting which bear on the findings, and so on. Reflect carefully on any factors that could have influenced the information you obtained from your participants and report it here. And again, do not interpret or explain these elements, simply report them. You can draw conclusions about them and about how they influenced the data and analysis in Chapter Five.

Resource

Refer to the Ethical and Legal Criteria for Population/Site Anonymity:

Hypothesis Testing

In this section, you will describe the statistics you performed to test the hypotheses for each research question; therefore, the most logical way to present this section may be in the order of your research questions. Within the section, make sure to include the following:

- Assumptions made about the data
- Assumptions needed for each inferential statistical test, how you tested for them, the outcomes of those tests, and what you did if the data did not meet the assumptions
- Descriptive statistics for each variable (If you used transformed data, report descriptive statistics for both the raw and transformed data.)
- A clear description of the inferential statistical test, along with the test’s statistical results reported in APA style
- The obtained power and effect size for each test
- The alpha level at which you rejected the null hypothesis
- A clear statement of whether you accepted or rejected each null hypothesis
- Figures and/or tables (in APA style) that clearly present your results
- Any post-hoc tests (e.g., Tukey’s HSD) that were performed and the statistical results

Summary of the Hypothesis Testing

This section should help orient the reader to the main statistical findings, after just going through the details presented in the previous section. Here, each research question and its
corresponding hypotheses are treated separately, showing its own result or finding. Statements here should simply summarize the results, not provide details, or describe the analysis. Here, a single sentence or two is often sufficient for each result or finding. In a strong sense, this section is simply a set of statements summarizing each result concisely and nothing more.

A common organizational structure is:

1. Hypothesis (or research question) 1 results.
2. Hypothesis (or research question) 2 results.
3. Hypothesis (or research question) 3 results.
4. And so on . . .

Consult standard texts on statistical presentation for the proper phrasing of results. In this section, be as concise as possible, simply giving the results of the analysis for each of the hypotheses or research questions.

**Post-hoc Analysis**

(or Analyses; delete this section if these were not performed)

Sometimes a study provides interesting and relevant data that were not anticipated by the researcher. In these cases, a researcher may be justified in performing analyses that were not planned a priori; that is before the study began. These post hoc analyses occur “after the fact,” and do not directly answer a research question. If this situation occurred during the course of your research, you would describe that in this section. Clearly and objectively explain what occurred that prompted you to do additional analyses, what analyses you performed, and the statistical outcome. The discussion of the meaning of the results and how they contributed to your study will be addressed in Chapter Five.

If you did not perform any additional analyses, then simply do not include this section in your dissertation.

This section should not be confused with any post hoc tests you may have done as part of your hypothesis testing in the previous section.

**Summary**

This final section should summarize the answers to the original research question in terms of the hypotheses or sub-questions that the analysis answered. This section serves as the transition to Chapter Five, where these results will be discussed in detail, and so the conclusion should orient the reader to Chapter Five as well as summarize chapter four’s findings.
CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

In Chapter Five, writers provide personal insight into and interpretation of their study’s results. This does not mean, of course, that informal, first-person writing is now possible. But within the constraints of scholarly writing, the learner now presents what the study means to him or her, and more widely, what he or she thinks it means to the field of psychology, to the line of previous research, and to the communities interested in the topic. (Note: In APA style, avoid referring to yourself in 3rd person (e.g., “this researcher”. If you must refer to yourself, use 1st person singular. If possible, avoid referring to yourself at all. Passive voice is acceptable in scientific writing, when necessary. See p. 69 of your APA manual.)

In general, however, Chapter Five must accomplish two primary objectives:

1. It should assess whether the dissertation addresses the problems that precipitated the study (and how well); in doing so, the learner should interpret the study’s results in light of existing findings in the field.
2. It should recommend directions for future study.

To accomplish the first objective, Chapter Five addresses and discusses what the study means: Did the study answer the research question(s), and what are its implications for the research question, the previous literature, and the wider communities of interest? Whereas Chapter Four was limited to simply presenting the results, now the researcher must show how those results do or do not answer the research question and what they mean in its light.

In those dissertations where the analysis does not support the hypotheses or fully answer the research question, the researcher fully discusses and develops the meaning and possible reasons for this outcome. In these cases, Chapter Five may seem like the reflections of a physician who missed a diagnosis, carefully turning over every possible explanation for why the outcome was as it was. Such an outcome is not a failure because the overarching purpose of a dissertation is to add to the body of knowledge. Regardless of your findings, they provide information about your topic.

The second objective is to make recommendations for future research. To do so, Chapter Five should discuss design and methodological improvements that could strengthen the study, what kinds of data might be collected to strengthen the results and their meaning; and new research questions or problems the results leave unfinished.

These two main objectives can be met by following the section outlines above, which will now be described in greater detail. Obviously, each researcher will have his or her own approach, and it is wise to consult with one’s mentor as to the final design of Chapter Five. But these sections will cover the main issues involved in the two primary objectives.

Like all such chapters in the dissertation, start with an introduction that precedes the first heading (“Summary of the Results” in this case). The introduction forms the transition (with the conclusion of the previous chapter) section. It introduces the chapter, not the dissertation. The researcher should provide the reader with a brief introduction stating the purpose of the chapter, the organization or main sections of the chapter, and a description of how the chapter fits into the overall dissertation. This should set the stage for the remainder of the chapter, as well as giving the reader an understanding of the logical flow of the chapter’s main points and how it relates to the preceding chapters.
Summary of the Results
The purpose of this section is to refresh the reader’s understanding of the overall study. It should 1) restate the general and research problems, 2) explain the study’s significance, 3) very briefly indicate the literature reviewed (particularly new findings published while the dissertation was being completed), 4) the methodology used, and 5) a very concise recapitulation of the study’s findings. Do not repeat the relevant sections from earlier chapters. Summarize concisely and in a manner that helps the reader understand that the study has come full circle by addressing the research problem by finding new knowledge to fill the gap in the literature as presented in Chapter One. Provide enough to refresh the reader’s understanding of the overall study, including the main points from the theoretical framework and the review of the previous research, then move on to the core of the Chapter, the sections to follow.

The aim of this section is orientation of the reader to an overview of the study and what the findings were.

Discussion of the Results
The key word here is “discussion.” In Chapter Four, the researcher simply presented the results. But now begins the researcher’s personal interpretation of what those results mean. This section relates and interprets the results of the study to their initial hypotheses and research questions, illuminating the practical and theoretical implications and meanings of the study for the reader. There really are two interacting questions at play throughout Chapter Five: What does the study (and any component result) mean? And, Why did it turn out like that?

This section interprets the results in light of the original research question(s) or hypotheses, that is, an intra-study interpretation. How well do the results answer the research question or support those hypotheses? Can they be interpreted plausibly to provide a stronger answer, and if so, how? And why did the results turn out as they did?

Some dissertations fail to find support for their initial hypotheses or turn out not to or only partially answer the research question. If this is the case, what does it mean in light of the original question(s)? Does a failure to find support for a research hypothesis, for example, mean that the search should be abandoned? Are their other implications of the outcome? What might they be? And finally, what plausible research design or methodological explanations might account for the outcome?

This search for explanations of the results of the study itself will be complemented by the following section’s discussion of the relationship of the conclusions with the previous research and the wider fields of interest. Insofar as this section focuses inwardly, on the study itself, it also identifies the limitations of the study – its design limitations, problems, or other elements that the researcher finds had some impact on the results – but a fuller discussion of the limitations and delimitations can be saved for “Limitations”, below.

Conclusions Based on the Results
While the previous section, “Discussion of the Results” is an inward focus on interpreting the nuances of the dissertation study, the “Conclusions Based on the Results” section shifts focus outward toward the previous literature and the wider field of interest. What do the results mean for them? For example, if the study did not strongly confirm results that had been predicted to be fairly strong in the previous research, and if you did not turn up any intra-study flaws or design weaknesses to account for that, then perhaps the finding challenges previously-held beliefs. As such, its failure to support a hypothesis may be a very
important finding indeed. This section is where the researcher teases out these meanings of the findings.

This section should present two sections with the following sub-headings: “Comparison of the Findings with the Theoretical Framework and Previous Literature,” and “Interpretation of the Findings.” The first sub-section should address how the findings fit in with the previous literature and the theoretical framework that you presented in Chapter Two. Is there agreement or disagreement, support or disconfirmation? What does it mean for the researcher’s discipline or for the community of interest who outlined in the “Background of the Problem” in Chapter One? Under the second sub-heading, why your study yielded the findings that it did. What is there in that previous literature of research or theory that accounts for the outcome as it is? What plausible explanations might there be?

This is the sort of reflection called for here in the heart of Chapter Five. Provide the reader with a clear discussion of what the outcomes of the study mean for the wider literature and community, and what might account for the outcomes. Explain how the findings fit in with the theoretical framework and research literature you reviewed in Chapter Two. Make sure to provide citations throughout as needed.

**Limitations**

One of the most common reasons for studies’ not supporting the hypotheses or research questions as strongly as expected is design limitations. Earlier they would have been mentioned in “Discussion of the Results” as possible explanations for a surprising outcome. Here the researcher more fully discusses design problems or limitations, even if the dissertation outcome was exactly as expected. The researcher should identify and discuss any design element that, with improvement, could significantly enhance the quality of the results without being unrealistic. (Certainly, any study would have better external validity if it sampled the entire population, but that is not usually realistic.) Here the emphasis should be not on covering every possible improvement or problem, but on reasonable improvements that will result in better future research and stronger results from similar studies.

Limitations do not include only the flaws and mistakes, although candidly discussing these is necessary. They also include good-enough elements that could realistically be made better. Converting convenience sampling to random sampling is an example. The fact that many dissertations are done on a limited budget and with severe time constraints usually leaves their authors with a wish-list of improvements; here is where those should be candidly and modestly discussed. No one expects perfection of any study, but the scientific community does expect researchers to be transparent about how they could improve their work. Here is where learners provide that transparency. As you discuss limitations of your study, be mindful of being overly harsh in your critique. You don’t want to leave the reader with the impression that the research was poorly conceived and conducted.

This section also covers known delimiters—things which your study did not intend to study, but might have shed some light on the issue or phenomenon your investigated. For example, perhaps you only studied a particular age group in your study; but by adding other age groups you might have gained more understanding.

**Implications for Practice**

In this section, describe the practical implications your research has for the wider community of stakeholders. How might your research benefit or be used by professionals in your field, as well as those in related disciplines? Avoid the temptation to overstate the
implications your research might have. Make sure to provide citations from the research literature that support your assertions.

**Recommendations for Further Research**

Researchers can discuss as many as four categories of recommendations for further studies. Each category reflects back on one of the previous sections of the Chapter. The four most common categories of recommendations are:

- Recommendations developed directly from the data.
- Recommendations derived from methodological, research design, or other limitations of the study.
- Recommendations based on delimitations.
- Recommendations to investigate issues not supported by the data but relevant to the research problem.

**Recommendations developed directly from the data.**

These are the typical “recommendations for further study,” built directly on the results presented in Chapter Four and discussed above in “Discussion of the Results” and “Conclusions Based on the Results.” Most results raise as many questions as they answer, and here is where they are described. Very commonly, the results can call for the “next level” of investigation. These recommendations can also include recommendations for treatments or interventions supported by the data as well.

**Recommendations derived from methodological, research design, or other limitations of the study.**

Once again, these are typical and frequent. They build directly on the limitations described in the previous section.

**Recommendations based on delimitations.**

This category of recommendations for further research appears less often in dissertations, although it is important. Every researcher decides early in the process what important questions, issues, variables, or other facets of a topic he or she will leave out. The reasons for doing so are usually pragmatic, involving availability of resources, time frames, and other practical considerations. Sometimes, important and interesting aspects of a problem are left out for sound theoretical reasons. All such omissions are “delimitations,” aspects of the subject that are important and meaningful, but that were intentionally not investigated for one reason or another.

It is not necessary or wise to try to include any and all such delimitations here. Rather, the researcher focuses on those offering the greatest chance of broadening or deepening our knowledge of the phenomenon.

**Recommendations to investigate issues not supported by the data but relevant to the research problem.**

This category in many respects resembles the recommendations based on delimitations, but is different in an important way: It recommends further work on issues that arose during the study, and that appear to be “serendipitous.” This is a judgment call. Is the “new” element sufficiently important, based in previous theory or research or in another theoretical frame, to call for its study based on insufficient data in this study? The researcher must weigh all the factors. Probably here is where the novice researcher must
tread the most carefully, but also here is where he or she can have the biggest impact. Synthesizing two previously distant lines of thinking by means of such a recommendation is a very satisfying scientific achievement; if your study allows for it, take the opportunity to defend it to your committee.

**Conclusion**

This section should begin with a concise summary of the dissertation and then move on to overall conclusions. Note that conclusions are the ideas that you arrive at by considering the summary. Therefore, in this section, the writer sums up the dissertation, offers a final description (always concise, sometimes eloquent) of the answers to the research question(s), and provides closure to the manuscript as a whole. Here the writer may provide a rhetorical suggestion for how the study could be used in furthering our understanding of the problem dealt with. Some researchers in the conclusion exhibit a more lyrical and personal tone, but usually, this is discouraged in favor of consistency of tone.

Researchers should check with their mentors to learn the mentors’ preferences regarding personal statements of the meaning of the project to the researchers. Some permit this; some discourage it. If permitted, such statements of personal growth, reflections on lessons learned as a scholar-researcher, and descriptions of the impact of the dissertation on one’s professional growth can often provide a satisfying and scholarly final cadence to the dissertation. Again, however, maintain the scholarly tone and attitude that prevails throughout the dissertation.
REFERENCES


APPENDIX A: RESEARCH PROBLEM

Before Starting: What is a "problem"?

Before writing Chapter One, you should understand what is meant in dissertation terminology by the word "problem." In a research context, the word is typically used in two ways: First, a "problem" is a real-world or theoretical situation or condition which someone defines as requiring a solution. A real-world or theoretical problem orients you to the kind of study you will undertake, but they are far too unfocused to provide a basis for a realistic research project. You will want to move from the “problem” in the general sense to a statement of the research problem. The first step in that direction is to do a literature review designed to tell you everything that is already known about the problem. At the end of that literature review, you should be able to answer these four questions: (a) What has been researched about the topic? (b) What controversies exist about the problem? (These controversies typically arise from competing interpretations of the data or competing theories used to explain them.) (c) What flaws in the research methodology and design have hindered our understanding of the topic? and (d) What unanswered questions remain for further research?

What controversies exist among the interpretations of that research? Suppose that a researcher discovers that there are, in the literature, two competing interpretations of the bulk of the findings on a particular topic. The researcher realizes that this is a research problem: to determine which interpretation of previous findings is better supported by new research.

What problems in research methodology and design have hindered understanding of the topic? In evaluating the previous research, perhaps the researcher finds that most of the studies used relatively small or localized samples and that their designs failed to control for other possible alternative explanations.

What unanswered questions remain for further research? In reading the discussion sections of many articles, a researcher can find that a number of them reach similar conclusions and make similar recommendations for further research. It might be decided that any of these commonly mentioned “recommendations for further research” can be the basis of a new research problem.

Occasionally, a learner discovers that very little research exists on the topic of interest, and this in itself could be a research problem: to explore the topic area to find what may be happening "in the field." However, it is generally not a good idea to tackle this sort of research problem in a dissertation, because the challenges, expense, and complexity of such an exploratory, descriptive study can be daunting for a novice researcher. It is preferable to derive one’s research problem from a well-established line of research. This allows for a clear demonstration of "contributing original knowledge," and establishes the significance and purpose of the study much more easily.

Keeping clear these two senses of the word problem helps in preparing the first five sections of Chapter One. The opening section, “Background of the Problem,” discusses the real-world problem of interest and the relevant literature about it. The "Statement of the Problem," on the other hand, states the research problem derived from the literature. The “Purpose of the Study” typically discusses how the research problem focuses a study that will fill in a gap in the literature, repair a flaw in earlier designs, or address a controversy about existing theory or evidence. The “Significance of the Study” articulates how the value of the study in adding to the existing literature as well as increasing our knowledge about the topic. Finally,
in the "Research Question" section, the research problem will be explicitly rephrased as a tightly focused research question and a set of predicted findings.
APPENDIX B: RESEARCH QUESTIONS AND HYPOTHESES

After stating the nature of the research problem, you are well on your way to answering the main issue in this section: what is your research question and what hypotheses flow from that question? (Note: Hypotheses are not required and should not be included in Chapter One, but are required in Chapter Three.)

First a word about "hypotheses," which are statements often associated with (and unfortunately often confused with) research questions. There are two schools of thought about hypotheses, one traditional and the other oriented to what Robson calls "real-world research" (1993, pp 28-29). The traditional approach follows these four guidelines:

- Guideline 1. Hypotheses are used only in quantitative (statistical) research studies.
- Guideline 2. Formal hypotheses are used only in studies whose purpose is to test a prediction. Informal hypotheses (called research hypotheses) may be used in descriptive and correlation statistical studies to express expected findings.
- Guideline 3. Formal hypotheses should be stated as a null hypothesis, accompanied by an alternative hypothesis. Each two-sentence pair can be thought of as a hypothesis set. This guideline is debated even within the traditionalist community (cf. Leedy & Ormrod, 2016).
- Guideline 4. For each research question, there should be one hypothesis set (formal) or one research hypothesis (informal).

The hypothesis or hypotheses are directly linked to the wording of the research question, which in turn is directly linked to the wording of the research problem. Let's turn our attention to the research question now, and then return later to the issue of hypotheses.

The statement of the research problem should be a concise statement, ideally one or two sentences long. It should set up the "purpose of the study" neatly. And in turn, the statement of the problem should lend itself to translation into a research question that asks precisely what this study must answer in order to (a) solve the research problem and (b) achieve its purpose. The research question is a conceptual question, indicating the exact scope of the study.

Acceptable research questions should have the following characteristics:

- It is a question.
- It can be answered.
- Because it is closely linked to a viable research problem (which in turn is linked to a wider problem which is important to some stakeholders), it has significance and has not already been answered.
- It clearly identifies the variables and their relationships that will be investigated: some level of workers' morale is the dependent variable, and the two independent variables are the MBO management approach and the human-potential management approach. It is suggested that there will be some relationship between the DV and the two IVs, and those relationships will be compared with one another. (For a full discussion of constructs, variables, and operational definitions, see Section
- The question, if reduced to its keywords (management, management-by-objective, human potentials, worker morale, etc.), will give readers a good idea of what the study investigates and will bring up the study when others search published dissertations.
APPENDIX C: QUANTITATIVE RESEARCH DESIGN

Introduction to "Design" and Notation.

The idea of a "research design" confuses many people. You can compare "design" in the research process to the "blueprint" used in building a house or a recipe for creating a culinary dish. Your design is a blueprint showing how all the elements of your study - samples (usually groups), measures, treatment conditions or other variables and factors being investigated, methods of assignment and analysis - are coordinated in the effort to answer the research question. Design is how you protect your study from threats to its validity (and in qualitative research, threats to its credibility). You can think of design as taking place in two phases: deciding what the potential validity threats are and then setting up the order of events and procedures of the study to protect against those threats.

Thanks to generations of researchers since the Enlightenment, we have a variety of "short-hand" design terms that stand for more elaborate but standardized approaches to coordinating all the elements of your study. (For a classic and thorough discussion, see Campbell and Stanley, 1963; also, Norris, 1996, provides a succinct but useful summary.)

For instance, here is a brief (and not exhaustive) table, using items borrowed from Campbell and Stanley (1963), listing the most common design names. Each one represents a much more elaborate and detailed set of blueprints for building and carrying out your project. The material here merely summarizes high points of design; it is up to you to become knowledgeable about all the details lurking behind the terminology, because as we know, "The devil is in the details"!

Table 1. Descriptions of Quantitative Design Notation (from Campbell and Stanley, 1963).

<table>
<thead>
<tr>
<th>Design Item</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Represents the exposure of a group to an experimental variable or event</td>
</tr>
<tr>
<td>O</td>
<td>Refers to some process of observation or measurement</td>
</tr>
<tr>
<td>&quot;Time&quot;</td>
<td>The left-to-right dimension indicates the temporal order The vertical dimension indicates simultaneous occurrences</td>
</tr>
<tr>
<td>R</td>
<td>Means &quot;Random&quot; assignment to separate groups</td>
</tr>
<tr>
<td>N</td>
<td>Means &quot;Non-random&quot; assignment to separate groups</td>
</tr>
<tr>
<td>Sub-scripts</td>
<td>Means additional information about a group; e.g., N₁ means &quot;non-randomly assigned group #1&quot;</td>
</tr>
</tbody>
</table>

Quantitative researchers should pay attention, but all should read on because this background is important for everyone. According to William Trochim (2006) (whose Research Methods Knowledge Base is published in both paper and electronic versions), settling on your design begins with two simple questions:

- Question 1) Is random assignment used? If you answer YES to the first question, your design will be a randomized experimental design. If you answer NO to the first question, you must ask the second question:
- Question 2) Is there a control group or multiple measures? Answering YES to this question means that your design will be a quasi-experimental design. Answering No means that you have a non-experimental design.
- That's it. In quantitative studies, the available designs are experimental, quasi-experimental, or non-experimental. (Some call the third type "pre-experimental."
These two questions clearly put us in the realm of quantitative (statistical) research, because randomization and control are simply not an issue in qualitative designs. However, read on even if you are planning a qualitative study because the general features of design apply to both methodologies.

The word design implies some kind of picture. And so it is. In most research texts, designs are depicted by different kinds of "notations" or "diagrams" that show the actual structure of the study. For convenience, Table 1 (above) summarizes some of the most commonly used notations for research design, taken from Donald Campbell and J.C. Stanley's 1963 classic Experimental and Quasi-experimental Designs for Research. (Qualitative learners, be patient: your turn will come.)

For example, suppose we are proposing a pre-test/post-test non-randomly assigned two-group comparison study of the outcome of a particular form of psychotherapy. To put that verbal design description into Campbell and Stanley’s notation would look like this:

<table>
<thead>
<tr>
<th>Design</th>
<th>Time &gt; &gt; &gt; &gt; &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest-posttest</td>
<td></td>
</tr>
<tr>
<td>Nonequivalent</td>
<td></td>
</tr>
<tr>
<td>groups quasi-experiment</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>O</td>
</tr>
<tr>
<td>O</td>
<td>X</td>
</tr>
<tr>
<td>N</td>
<td>O</td>
</tr>
</tbody>
</table>

In the design diagram, you see the verbal description of the design type on the left, and in the right column, you can visualize the structure of the study. Two non-randomly assigned groups (which are therefore "non-equivalent" and notated as "N") start at the same point in time (left-right dimension indicates time, and simultaneous things occur at the same point vertically). First, each is “observed” at the same point in time, that is, the pre-test is given. A little later in the time sequence, the first group (the “treatment” group) is given the psychotherapy, while the second group (the “comparison” group) waits or is otherwise occupied. Finally, both groups are again simultaneously measured by the post-test.

Look at the words in the “design” box: “pretest-posttest nonequivalent groups quasi-experimental design.” Notice that there are three major components: measures (a pre-test and a post-test), groups (how the sample is assigned, “non-equivalent groups”), and type of design (quasi-experimental). You can add specifications for any one of those three if doing so more clearly identifies your design. For example, if we did the pre-test twice for some reason, we could call it a “double-pre-test post-test nonequivalent groups quasi-experimental design.”

What is the purpose of a design?

Research designs protect the study from various threats to validity and reliability (and in qualitative analysis, threats to credibility and dependability). Essentially, researchers want to design against the sorts of threats to validity and reliability (or credibility, utility, and transferability for qualitative studies) they think their study is prey to. Of course, besides the design, researchers have other protections against validity threats, such as logical arguments, measuring the threat itself to show it does not invalidate the study, using statistics to gauge the impact of other variables, and so on. In general, you want to use as many approaches to reducing or eliminating threats to validity as you can, and design is one of them (cf. Trochim, 2006; also, consult Norris, 1996, for a succinct but quite lucid discussion of quantitative design principles).
Let’s look at an example of using design to protect against a maturation threat (one type of the larger class of confound variance). (See any text on research methods for various threats to validity and reliability.) This means that you think that between the pre-test and the post-test your group might grow more mature and any changes you note at post-test might be due to maturation rather than to your treatment. If you do the pre-test twice, with a time-period similar to the treatment period between the pre-tests, you will see if any change occurs between them. If a change occurs, you can expect that a similar degree of change will happen between the second pre-test and the post-test – whether you administer your treatment or not. So if measured changes at the post-test are significantly greater (or less) than those measured between the two pre-tests, you may conclude that your treatment may be having an effect. Likewise, if there is no change between the pre-tests in the first place but there is a change at the post-test, then you might be justified in thinking that your treatment condition made the difference (cf. Trochim, 2006). When you added the second pretest, you were using design to counter a maturation threat.

Consider as many possible types of threat to the validity (or credibility) of your study as you can, and play with various design possibilities to protect against them. Ask yourself these questions (or their equivalents in qualitative language) taken from Norris (1996):

- “How am I minimizing error variance?”
- “How am I maximizing experimental variance?”
- “How am I minimizing confound variance?”
- “How am I minimizing extraneous variance?” (pp. 52-53).

There are many similar ways to design your sequences of observations and treatments to ensure that the various kinds of validity threats are minimized. Below is a set of other commonly seen research designs in quantitative research. They will allow you to practice generating the verbal description of a design, as well as seeing how the notational design would look.

- Pretest-posttest randomized experimental design (a classic).

<table>
<thead>
<tr>
<th>Pretest-Posttest</th>
<th>R</th>
<th>O</th>
<th>X</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randomized</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>R</td>
<td>O</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Single observation survey (non-experiment) design (another classic)

<table>
<thead>
<tr>
<th>Single observation</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-experiment</td>
<td></td>
<td></td>
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</table>

- Post-test only non-experiment (no comparison group; this is a descriptive design).

<table>
<thead>
<tr>
<th>Posttest</th>
<th>N</th>
<th>X</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-experiment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Multiple measures pretest posttest non-randomized quasi-experiment (because two groups and multiple measures).
Designs can include multiple measures, different times of measuring variables, applying different treatments (Xs) to different groups, and a myriad of variations on all the elements. It is possible to design studies (especially quantitative studies) which measure different dependent variables in the same group of participants against separate treatment conditions. The variations are endless. For a thorough discussion of design, see any good text on research methods; Campbell and Stanley (1963) is the classic for experimental and quasi-experimental designs. Trochim’s Research Methods Knowledge Base (2006) is especially helpful to get a clear idea of how designs work collaboratively with the research question and the purpose of the study.
APPENDIX D: POPULATIONS AND SAMPLES

In quantitative studies, your research methodology and approach (experiment? quasi-experiment? non-experimental correlation?) will dictate how demanding your sample selection and assignment methods must be. The question is whether the sample sufficiently represents the population from which it is drawn. You, the researcher, must decide ahead of time how representative of the population your sample must be, and then must design the study to account for that. In this section, you must show your readers how you accomplished representativeness in your sample selection procedures.

For instance, in a true experiment (in the lab), because wide external validity is quite important, random selection and assignment are the best tools to get high external validity (representativeness). Consequently, your design will demand truly random selection of your sample and random assignment to groups. In a quasi-experiment, you generally try to design for EITHER random selection of the sample OR random assignment of participants into the groups. Some correlation studies don’t demand quite that high level of random selection or assignment, but you must determine yourself how widely you are going to try to generalize your correlations to the population, and design your selection procedures accordingly. The more external validity you require, the more you need to design for a representative sample of the population. This section should describe your thinking on this issue, to lay the groundwork for describing the actual sampling procedures you will carry out.

Resource