



The Goal of This Book

This book is a practical introduction to the skills required to complete a project of research, analysis, and writing—a guide to the whole process, from scoping out your topic to writing a report or dissertation.

To understand this preview, you should learn now that:

- **Research** is the process or product of acquiring knowledge
- **Analysis** is the process of disaggregating, categorizing, and relating something in order to better understand it
- **Writing** is the process of recording what you mean to communicate

This book teaches research, analysis, and writing as a complete skill set. Why should you care? As explained in the following five sections, this skill set is useful to you, useful at all levels of higher education and business, applicable throughout the research project from start to finish, practical, and scientific.

Useful to You

This book is aimed at students in higher education (i.e., optional formal study as an adult). The best time to open this book is when you enter higher education as an undergraduate student. Realistically, you are most likely to open this book around the middle of your

Learning Objectives and Outcomes

At the end of this chapter, you should be able to:

1. Understand the goal of this book
2. Realize your needs as a reader of this book
3. Consider your roles as a researcher
4. Conceptualize the process of research from start to finish
5. Conceptualize the different levels of research
6. Differentiate the practical and theoretical skills that you would need to complete a research project
7. Understand what is meant by “scientific skills”
8. Know what to expect in the rest of this book



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degree, when students typically get around to completing the skills requirements for their academic degree.

If every student and professor thought ahead to all the research projects that are required during coursework, he or she would realize the value of opening a book like this at the beginning of any higher education. Any higher education demands research, analysis, and writing from the start, so it is amazing how rarely the skill set is taught. Just a few years ago, a fashion emerged for opposing these skills

on the grounds that they repressed subjective creativity and experiences and perpetuated traditional “power” structures, but these are fundamental skills without any agendas of their own.

Fortunately, more and more institutions of higher education are requiring their students to demonstrate some research skills. Many schools now require students to pass at least one approved course in such skills. Many degree programs now demand a final research project (a thesis or dissertation or capstone project) from all students before they can be awarded a degree.

More and more employers are demanding these skills. More of us are being employed as **knowledge workers**—people whose main value is their knowledge, such as consultants, analysts, and lawyers. Perhaps you are a professional who has been asked to explain something or to report on an issue. You could be in commercial or official work and tasked with producing regular reports on what is happening. You may be expected to analyze what other people think is happening. You could be the person who undertakes to decide which among a group of reports and analyses is most accurate or useful. You may even be considering a full-time career in research (see Research in the Real World Box 1.1).

Whatever the course or project, you will find this book useful.

All Levels

This book is meant to guide you at every level of your career, from your undergraduate degree to your professional employment. A *level* is a relative position or rank in a hierarchy. *Hierarchies* have levels from the lowest to

Research in the Real World Box 1.1

Research Occupations Recognized by the U.S. Department of Labor

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Source: ©iStockphoto.com/hal1982.

“*Research Associate*: A term applied to persons who conduct independent research in scientific, legal, medical, political, academic, or other specialized fields. Individuals working at this level are required to have a graduate degree.”

“*Research Engineer*: Conducts research in a field or specialization of an engineering discipline to discover facts, or performs research

directed toward investigation, evaluation, and application of known engineering theories and principles. Plans and conducts, or directs engineering personnel performing, complex engineering experiments to test, prove, or modify theoretical propositions on basis of research findings and experiences of others researching in related technological areas. Evaluates findings to develop new concepts, products, equipment, or processes; or to develop applications of findings to new uses. Prepares technical reports for use by engineering or management personnel for long- and short-range planning, or for use by sales engineering personnel in sales or technical services activities. Classifications are made according to discipline. May use computer-assisted engineering software and equipment.”

Source: U.S. Department of Labor, <http://www.bls.gov>.

the highest. Institutions of higher education issue degrees at different levels: undergraduate, and postgraduate or graduate, including master's and doctoral degrees. Businesses also have levels, from the most junior employee to the most senior, accountable, or responsible.

Most books on research or analysis are written for highly specialized graduate students or professionals, but in reality almost everybody, at almost any level, in almost any position, needs to understand the overall process of research, analysis, and writing.

Although this book is useful at all levels, people tend to need or learn these skills at particular levels, so this book is aimed at:

- Advanced undergrads as they consider longer research papers
- Lower-level professional students, such as candidates for a master's degree in business administration or public administration, who are asked to apply their new knowledge in order to explain or advise
- Commercial analysts, official analysts, and staffers who report to superiors

This is a book that you can reference throughout your higher education and your career. It will get you started, remind you of what you should be doing, show you more advanced techniques when you need them, and remind you of what you have learned. This book is the guidance you can call on whenever you need it, from the start of your career to your next challenge.

From Start to Finish

A process is a series of activities or steps by which something occurs or is produced.

This book is intended to be an introductory but comprehensive guide to the complete process of research, from start to finish. It is a practical guide through all the steps of the project, from choosing the topic to delivering the final written product.

Most books on research concentrate on parts of the process, such as statistical analysis or how to write better. These books leave readers struggling to fill in the other stages of the process. This book does not teach statistics, although it explains how to make methodological choices and search for more advanced help. Instead, it aims to be a practical, accessible, step-by-step guide to anyone intimidated by the overall process of research, analysis, and writing.

To help you imagine what you will learn in the rest of this book and what you should be able to do by the end of the book, consider the following steps in a typical research process:

1. Design a research project
2. Review the existing literature or knowledge

3. Analyze the phenomena
4. Develop a valid, sound, and cogent argument
5. Build a theory
6. Deduce or induce hypotheses
7. Model key processes
8. Test hypotheses
9. Deliver a coherently written product, such as an undergraduate thesis or professional report

The scale of the product does not matter; whether you are writing a short memorandum or a publishable document, this book contains skills to help you.

Practical

This book is meant to be practical. Something is practical if it can be applied, rather than remaining purely **theoretical**, that is, explanatory but perhaps impractical. **Practice** involves doing things, while **theory** is used to explain facts (as you will learn in more detail in Chapter 8).

You need to learn practical skills before you can start doing things. You may not know where to start, or you may just want to improve your skills. You may be one of the many people who enjoys reading about a subject but does not know how to evaluate sources of information. You may like writing but not know how to organize your knowledge. You may know what you want to say but have difficulty writing it down.

Some people would lead you to believe that research, analysis, and writing are skills that you are either born with or not, but be skeptical of such claims. Many people were never taught these skills, so they naturally view such skills as exotic or vague; other people have acquired these skills but would rather claim that they have exceptional, inaccessible talents than admit how hard they had to work and how many mistakes they made along the way to greatness.

The research, analytical, and writing skills in this book are generally accessible, meaning that almost anyone, after some dedication and application, can acquire them.

Scientific

This book teaches you scientific skills. The modern word **science** is derived from the ancient Latin word *scientia*, meaning “knowledge,” which indicates how fundamental science is to knowledge.

The word *science* here refers to a replicable way of verifying knowledge, which you will learn more about in the next and subsequent chapters. In practice, this usually involves carrying out observations, developing theories that could explain the observations, and looking for evidence to support a theory—all in a replicable way.

Some researchers do not think of themselves as scientists and are critical of what they see as narrow scientific approaches. Indeed, science is not necessarily appropriate in creative, interpretive, or philosophical endeavors. Genuinely original creations are usually protected (ethically and legally) from replication. Subjective interpretations or experiences are not perfectly replicable. **Philosophy** (the reasoned study of fundamental issues) is not necessarily replicable or even factual.

However, you can apply science wherever you want to be replicable or evidence-based rather than merely creative, interpretive, or philosophical. You do not need to be a hard scientist to use scientific skills; you were developing scientific skills as a child when you tested how different objects interact, and you have demonstrated scientific skills whenever you have presented evidence during an argument or pondered how to explain the world around you.

Scientific skills are demanded in professions and endeavors that contain no explicit reference to science. For instance, managerial skill sets now routinely include “performance measurement.” Much research is now differentiated as “evidence-based.” In each case, the approach is fundamentally scientific; if we could not replicate it, how would we know whether performance is being measured effectively or whether the research is truly evidence-based?

The **hard sciences**, or *natural sciences* (such as physics, chemistry, and biology), are easier for laboratory experimenters, but science can be applied anywhere. Most of the **applications** in this book are *social scientific*, a term which here refers to the application of science to the study of human society. Most formal professions and academic disciplines fall within the scope of this definition, including the formal **social sciences** (economics, politics, psychology, sociology, anthropology), some of the **humanities** (academic disciplines that study human culture, such as history) and **liberal arts** (the traditional core disciplines, such as philosophy and literature), and the professions (such as law and business).

The professions and social sciences dominate the 10 most popular majors in America (see Table 1.1).

Table 1.1 The 10 most popular and 10 least popular undergraduate majors in the U.S. in 2010

Popularity rank	Major	Students (percent of all majors)	Ratio of females to males (percent of all students in major)	Full-time employment rate (percent)	Earnings (median full-time, full-year salary, 2010, US\$)
1	Business management and administration	8	44:56	90	58,000
2	General business	5	39:61	90	60,000
3	Accounting	5	52:48	89	63,000
4	Nursing	4	92:08	77	60,000
5	Psychology	4	71:29	79	45,000
6	Elementary education	4	91:90	80	40,000
7	Marketing and marketing research	3	51:49	88	58,000
8	General education	3	76:24	84	42,000
9	English language and literature	3	67:33	80	48,000
10	Communications	3	58:42	83	50,000
162	Precision production and industrial arts	<0.01	11:89	93	(not available)
163	Geological and geophysical engineering	<0.01	27:73	97	(not available)
164	Nuclear engineering	<0.01	9:91	96	(not available)
165	Soil science	<0.01	24:76	83	(not available)

(Continued)

Table 1.1 (Continued)

Popularity rank	Major	Students (percent of all majors)	Ratio of females to males (percent of all students in major)	Full-time employment rate (percent)	Earnings (median full-time, full-year salary, 2010, US\$)
166	Geosciences	<0.01	36:64	91	(not available)
167	Educational administration and supervision	<0.01	53:47	79	(not available)
168	Pharmacology	<0.01	56:44	69	(not available)
169	Astronomy and astrophysics	<0.01	27:73	86	(not available)
170	Military technologies	<0.01	7:93	90	(not available)
171	School student counseling	<0.01	94:06	93	(not available)

Data sources: Carnevale and Cheah, 2013; Carnevale, Strohl, and Melton, 2011.

One of the reasons that social science majors are so employable is that social scientific skills are widely useful (see Table 1.2).

In this book, you will not find detailed discussion of particular laboratory methods, statistical methods, mere storytelling, purely philosophical discourse, or the arts of obfuscation so popular in legal and political settings, although you will learn to identify them. You will learn enough about the research, analytical, and writing processes in general to get you rolling through most projects. You will learn enough about your options that you could make informed choices about supplementary texts in more specialized areas.

A Preview of the Rest of This Book

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 This book will guide you through the entire process of research, from choosing your topic to writing the final **product**.

Table 1.2 Employment rate and earnings in the main social scientific, liberal arts, and humanities majors (in alphabetical order) in the U.S., 2010

Major	Ratio of females to males (percent of all students in major)	Full-time employment rate (percent)	Earnings (median full-time, full-year salary, 2010, US\$)
Anthropology and archaeology	61:39	78	45,000
Area, ethnic, and civilization studies	70:30	74	45,000
Art history and criticism	85:15	76	50,000
Composition and speech	60:40	80	45,000
History	40:60	84	50,000
Humanities	61:39	77	48,000
Intercultural and international studies	65:35	78	44,000
Liberal arts	60:40	82	48,000
Criminology	42:58	87	48,000
Economics	34:66	90	70,000
General social sciences	56:44	80	49,000
Geography	30:70	89	54,000
Interdisciplinary social sciences	70:30	80	48,000
International relations	60:40	85	50,000
Miscellaneous social sciences	54:46	78	51,000
Political science and government	41:59	86	59,000
Psychology	71:29	79	45,000
Sociology	68:32	82	45,000
Statistics and decision science	51:49	81	67,000

Data sources: Carnevale and Cheah, 2013; Carnevale, Strohl, and Melton, 2011.

The following chapters discuss the major steps of the process in the order that you would proceed through them in an ideal linear process. Realistically, as described in Chapter 2, you might move nonlinearly between steps, just as you might move among chapters of this book out of order.

Chapter 2 explains research: the different purposes of research; the different products of research; the different approaches to knowledge, including those in the humanities and the social sciences; and how to manage the project's life cycle.

Chapter 3 explains ethics and laws related to research: how to ethically and legally handle subjects, data, permissions and licenses, intellectual property, and supporters, and how to avoid misrepresentation and plagiarism.

Chapter 4 helps you to define the scope of your research: to identify a topic that is interesting, employable, important, improving, challenging, or novel; to justify its feasibility and to prepare the things that are necessary to make its achievement more likely; and to develop a proposal or design for the project.

Chapter 5 explains how to start reading about and reviewing your topic: how to evaluate and choose sources, how to manage your sources, and how to describe your review to others.

Chapter 6 explains analysis: the purposes of analysis, the different types of analysis in different domains, the different levels of analysis, and how analysis should be implemented.

Chapter 7 explores how to argue and explain. This chapter will cover desirable forms of argument, such as valid, sound, and cogent arguments, as well as undesirable forms of argument, including fallacies and biases. The chapter concludes with practical advice about how to describe and critique other arguments.

Chapter 8 explains theory, hypotheses, models, variables, constants, relationships, and boundaries; how to trace processes; and how to model trickier processes, such as contradictions, cycles, and nonlinear processes.

Chapter 9 explains methods, methodologies, and tests; the choice between control and naturalness; how to research history; how to research in the field; case studies; surveys; participant and non-participant observation; and experiments.

Chapter 10 explains the difference between observations, data, and evidence; the difference between correlation and causation; the value of empiricism and objectivity; how to classify data; how to produce data judgmentally; how to

find objective correlates; the application of triangulation, multiple measures, and meta-analysis; and the differences and trade-offs between quantitative and qualitative data.

Chapter 11 explains the creative and technical process of writing: structuring your whole document; getting started; disciplining your creativity; and raising the quality of your writing by structuring each section, paragraph, sentence, clause, and phrase; using subjects, objects, prepositions, adverbs, verbs, adjectives, and nouns appropriately; and writing more succinctly, precisely, and literally.

CHAPTER SUMMARY

This chapter explained:

- The goal of this book
- Your needs and roles
- All the levels of research that this book covers
- The process of research from start to finish
- This book's focus on the practical skills you will need to complete a research project
- The scientific skills that this book will cover
- What to expect in the rest of this book

KEY TERMS

(For definitions, please see the Glossary in the back of this book.)

Analysis 1

Application 6

Hard sciences 6

Humanities 6

Knowledge worker 2

Liberal arts 6

Philosophy 6

Practice 5

Product 8

Research 1

Science 6

Social science 6

Theoretical 5

Theory 5

Writing 1