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## Introduction to Research as Inquiry

Let me explain what this little book is and why I am writing it. It is not a guide to whipping up successful research papers from dribs and drabs of information. Nor is it a set of commandments or a list of random reference works. It is about the interplay of ideas (yours) with sources (from outside yourself) and about the nature and discovery of those sources. I want to persuade you, as a serious but uncertain student, that library research is not a mystery or a lucky dodge, but an investigation you control from start to finish, even though you cannot usually tell *what* sources you will discover. Like its twin, scientific experiment, library research is a form of structured inquiry with specific tools, rules, and techniques. Also like its twin, it is unpredictable, sometimes frustrating, but ultimately rewarding as you examine your findings, then add your own insights to make a compelling case. As a bonus, when you share your work—whether through writing, speaking, or technology—addressing one person or a wide audience, *you* create a new source, extending the cycle. There is no more fulfilling intellectual experience.

What do I mean by *student* and *library* in the previous paragraph? I want to reach anyone who feels anxious—or downright scared—when facing a task that involves seeking and weighing information. You may be starting your first research paper, your $n^{th}$ term project, even your doctoral dissertation: if you worry that you are not going to find enough of the "right stuff," then the ideas and suggestions in this book will put you at ease and back in charge. Each time

you work through the library research process, regardless of how different your aim or subject is from your previous efforts, you will become more fluent. Soon you will see how to modify the method and what alternatives exist if you are missing a key fact or suspect that a source cannot be trusted. As with any other complex activity, repetition with variations will lead first to mastery, then to creativity.

Novices often think that unless they have a gigantic university library at their disposal, they will fail to find all the sources they need. Not so. A bigger collection is not necessarily a better one for a specific research project. Not only are tens of millions of reputable sources of all sorts now in digital form as licensed databases or free on the Web, but libraries can often obtain material from elsewhere within a few days. Unless and until you come up short in the nearby collections available to you—typically your school's own library and your local public library—I urge you not to worry. But if you do conclude that you need more sources, speak with both your instructor (assuming you are doing a course-related research project) and a reference librarian about what you can do.

Likewise, do not assume dire consequences if your library does not have all the reference works and databases I mention. I name these titles simply as examples, not as necessary resources for everyone. Once you understand what each type of tool does, you can figure out—on your own or by asking—what your library has to offer for the job.

## Moving from the Known to the New

When you are familiar with an activity because you have done it flawlessly in the past, then you do not give it much time or thought or emotion. Why would you, unless the

outcome is especially significant, such as earning a high grade on a math exam tomorrow so that you can take calculus next term?

But if an activity is new to you—if it is familiar but a lot more complex than anything you have done in the past, if factors such as the setting or criteria for success are strange—then you will inevitably be unsure, anxious, and probably tempted to avoid the experience. Think about the first time you needed to figure out a big city's public transportation system on your own, so that you could travel from point A to point B within an hour. It was stressful—right?—even if all the maps and signs were in English. Now imagine the first time you got behind the wheel of a car, presumably after learning dozens of rules and cautions in a driver's education class. My guess is that although you felt somewhat uncertain about what to do and the order to do it in, you were so eager to get your permit that you remember the event as a stimulating rather than a harrowing experience.

These scenarios illustrate the range of research projects you will encounter in college and beyond, some completely foreign to you and others for which you have some background or experience. The trait they share is the hunt for "what's out there," a favorite phrase of teachers everywhere.

In the following sections I cover the purposes of research in general, the varieties of research, and the ways researchers communicate their findings. I start this way because I want to convince you that the library research process is part of a larger universe of inquiry. If you can identify the facets of any research study you encounter, and figure out how someone designed it (or could have designed it better), then you will be much readier for college-level research than most students, whether in a library or a laboratory. As you read the next few pages, keep in mind that your professors live

and breathe these issues as they go about the business of creating new knowledge in their fields.

## Reasons for Research

Before we examine the varieties and characteristics of research, we should consider why anyone does formal research in the first place. Here is a list of research goals I encounter frequently on a university campus, but they occur in other settings as well, such as in business, government, and professional organizations. Research serves to

1. Reveal the cause or causes of a phenomenon
2. Resolve an anomaly (something that doesn't make sense)
3. Test a hypothesis or develop a theory
4. Verify or replicate someone else's findings
5. Determine what a new instrument or technique can do
6. Adapt methods or results from one field to another
7. Observe or record an event as it occurs
8. Reproduce conditions from the past in the present
9. Understand human motivations for actions
10. Isolate factors and their interrelationships in a complex system
11. Predict or influence individual or group behavior
12. Improve the quality of life across cultures and populations
13. Analyze the components of a creative work

No doubt you can supply examples of each of these research incentives from your own reading and experience. I suggest you keep track of additional ones you come across from now on. My point is that although a researcher's intent

helps determine the specific methods he or she will use, all researchers share a deep, universal aim: to discover the truth about something that intrigues them.

## Varieties of Research

Most people think about research in large categories labeled with the field of the researcher or the course that requires a research project. For instance, you might refer to *historical research, scientific research, textual research,* or *sociological research.* These phrases suffice for general communication about what is meant, and they are the ones you see and hear in the media. They are not, however, precise as to the *way* someone tackles a research problem. The following chart lists some, but by no means all, of the common approaches to investigation used in research projects (also frequently called research studies), with brief descriptions. I don't dwell on any of them except the first—which is, after all, what this book is about. I simply want to lay out the cards so you will see how diverse the deck of inquiry is. The forms of research toward the top of the chart are the ones you are most likely to encounter during your first two years of college.

These methods overlap in real life—in fact, it's unusual for a given project *not* to involve more than one of them. Furthermore, the qualitative, quantitative, and empirical approaches are umbrella terms that can be applied to other methods as well. For now, just be alert to this variety.

| Research Method | Characteristics and Examples |
|---|---|
| Library | Involves identifying and locating sources that provide factual information or personal/expert opinion on a research question; necessary component of every other research method at some point |
| Experimental | Takes place in a dedicated environment, typically a laboratory, and involves specific equipment and procedural steps; molecular biological research to decode a species' genome is an example |
| Explicatory | Entails a careful, close, and focused examination of a single major text, or of evidence surrounding a single complex event, in an attempt to understand one or more aspects of it—for instance, why a poem is pleasing, or the probable causes of an event |
| Field | Occurs wherever the phenomenon under study exists, meaning the researcher goes to that location; archaeological excavation is one type |
| Observational | Takes place either in a laboratory or in the field, but entails capturing an exact record of some behavior (of either animate or inanimate objects); child psychologists who watch infants interact do this sort of research. Note that researchers may be observers or participants in the phenomenon they are studying, as when an anthropologist lives in a remote village to record the language used by people during religious ceremonies |

| Research Method | Characteristics and Examples |
|---|---|
| Interview | Includes any sort of conversation that addresses a specific experience or issue about which the interviewee is knowledgeable, involves questions prepared in advance, and is recorded in its entirety; oral history, for instance |
| Survey | Poses a series of questions to a group of people (usually a sample) with specific responses for individuals to choose from; usually captures demographic and socioeconomic information as well, to correlate with the responses; written questionnaires and telephone opinion polls are examples |
| Longitudinal | Follows a phenomenon over time; often used in educational or medical studies where the individuals in a group are periodically reexamined at specific intervals over many years |
| Archival | Involves the researcher in a close study of original documents—typically collected and retained by governments, organizations, or families—that exist in a unique location; genealogical research is a case in point |
| Qualitative | Designates any research whose results are captured in words, images, or nonnumeric symbols; for instance, research on dreams |
| Quantitative | Describes any approach where the phenomenon under study is captured via measurement and expressed in numbers that can be analyzed; opposite of qualitative research; econometric research on the international oil trade is an example |

*(continued)*

| Research Method | Characteristics and Examples |
|---|---|
| Empirical | Refers to studies using experiment or observation to test the validity of a phenomenon; less rigorously, refers to knowledge derived from experience, as when people assert that, based on empirical evidence, the sun will rise tomorrow morning |
| Theoretical | Entails speculation on the part of the researcher, and is usually based on the findings of other kinds of studies, in an attempt to account for or predict the behavior of a phenomenon; Einstein's work is a case in point |

## How Researchers Share Their Findings

You can think of these and other research methods as the engine of the new-knowledge-creation process, the necessary transformative stage between the researcher's curiosity and conclusions. Before you can appreciate those conclusions or take part in the process itself, you should be aware of the various ways researchers convey their results and interpretations to other experts and to the general public.

Here is yet another list, this time of how and where researchers most commonly communicate. Since most of these channels are familiar or self-explanatory, I keep my elaboration to a minimum. The product of research can be

1. A report in the form of a peer-reviewed article in a scholarly journal
2. An announcement in the form of a press release, interview, or story written by a journalist for a news publication or popular periodical
3. A book (also called a monograph when it is devoted to a single, complex topic)
4. A chapter in a collection of essays addressing the same or related themes
5. A presentation at a conference, sometimes later published in a proceedings volume or as a journal article
6. A master's thesis or doctoral dissertation, which may later be revised and issued as a book
7. A memoir or autobiography, typically by a senior scholar reflecting on his or her research career and appearing in journal article, chapter, or book format
8. A comment on another researcher's work, such as a letter to the editor or a book review, published in a newspaper or periodical
9. Nonprint media such as e-mail, listserv postings, blogs, personal Web pages, filmed documentaries, or broadcast interviews on radio or television
10. An overview or synthesis in an encyclopedia article or college textbook
11. Classroom teaching, conversations with colleagues, and student advising, types of communication that are seldom published but may well be captured and preserved as lecture notes, in footnotes, or in the acknowledgments of books or journal articles

In the course of your college education, you will read about each of these forms of communication. You will likely observe your professors engage in or allude to them as well.

### Peer Review

This is an essential activity in the world of learning. In its more general sense, peer review means that specialists on a topic have a duty to evaluate the work of others in the same area of expertise—just as those with experience in the professions serve as gatekeepers for their field. In its narrower sense, a peer-reviewed article is one that scholars in a discipline have judged to be worthwhile *before* it is published in a journal, thus assuring that poor research and weak arguments never see the light of day.

### Literature Review

A standard outcome of research is a literature review (also called a *research review* or a *review of the literature*). This is a paragraph, section, or entire chapter—depending on the nature and length of the publication—in which the author identifies and comments on previous attempts to answer the same, or related, research questions. Although you may never be asked to include a formal research review in anything you write in college, you will most definitely be expected to do research reviews for various projects, mainly to back up your own ideas and arguments, but also to prove to your teachers that you can identify and evaluate relevant sources.

Don't be misled by the phrases *literature review* or *review of the literature.* They refer to a summary of related research in *any* field. The terms are not limited to the novels, poems, or plays you read in an English course. So you may well come across a literature review on AIDS-related infant mortality in a journal article by medical researchers describing their study of the disease in newborns.

### Practice Critical Thinking

Create a dedicated computer file, notebook, or folder where you keep track of interesting research projects you encounter. Include where and how you came across the information, so that you can get back to it in the future. A good method is to regularly examine current issues, either online or in print at your library, of periodicals that carry what I call breakthrough stories: for example, any of the major news magazines (*Newsweek, Time, U.S. News & World Report*); the science section of a daily newspaper; or publications like *Nature, Psychology Today, Science,* or *Scientific American.* In each issue, look at the table of contents and choose the article that most intrigues you. Read it thoroughly and make notes about the questions the researchers address, the methods they use, and how they describe the results of their study. If other ideas occur to you—for instance, if you've read an article about how honeybees communicate and you wonder whether the same conclusions apply to wasps—write those down too, so you will get in the habit of thinking critically about the work of others. Be sure to record the bibliographic details of the article: author(s), title of the article, name of the publication, date, and page(s). If you prefer, you can print out or photocopy the article, write the bibliographic details on the copy (if they are not already present), and put your own comments in the margins.

The rest of this book guides you through the process of identifying sources for your own research projects. For now just realize that everyone starting a complex inquiry needs to discover two things: as much background information as possible on their topic of interest; and the research, conclu-

sions, and opinions of others who have examined the same topic and asked similar questions about it. Even a genius must start from the work of earlier thinkers, a truth symbolized by the image of Sir Isaac Newton (1642–1727) seeing farther because, as he is reputed to have said, he stood on the shoulders of giants—that is, of his own predecessors.

## From Here Forward

The next chapter of this book expands on the idea of library research as inquiry and recommends an efficient, effective way to plan your investigation *before* you start to uncover evidence. To do this, it offers a diagram of the library research process, three key definitions, and several suggestions for choosing a congenial research topic. It also raises the gnarly matter of plagiarism and introduces Mary's Maxims, a few friendly injunctions to all library researchers, which I intersperse throughout the book. The purpose of these maxims is to lower your anxiety and raise your expectations—and, I hope, your enjoyment—as you conduct library research in any setting.

Chapter 3 focuses on a basic, and versatile, library research strategy and the tools you need to wield at each stage. I concentrate on the characteristics of each kind of reference work and give examples, recognizing that your own library may well have different resources that perform the same functions.

Chapter 4 addresses practical issues everyone confronts in the course of research. I describe in detail the known-item and concept approaches for identifying sources and the two complementary variations of the latter, keyword and subject searching. I also go over search logic, the nontrivial matter

of locating and obtaining items, and some other techniques for discovering evidence.

Chapter 5 considers ways to evaluate sources and discusses the dynamism of inquiry—that is, the ever-shifting relationship among research questions, findings, and insight. Although this is emphatically not a composition textbook, I offer a few words about developing an argument, dealing with obstacles in the writing process, and documenting all the pertinent evidence. This final chapter reiterates a serious message I address at several points in the book: avoiding plagiarism. To conclude, I extract the principles and techniques covered earlier and suggest how, with a bit of tailoring, you can extrapolate them from one inquiry to the next—across time, place, and topics, as you move through your education and daily life.