

CHAPTER 01

Original Research and Inquiry

OVERVIEW

Why research? This chapter discusses the purpose of research in academic settings and beyond and describes its experiential, project-based, and collaborative nature. This textbook defines original research as research that pursues unanswered or unsettled questions and brings forth new insights. By thinking of research as an ongoing conversation, this chapter outlines how original research shared with an audience becomes recognized over time as specialized information and then accepted as common knowledge.

1.1 Undergraduate Research as Original Research

When you hear that your professor wants you to do research, what's your reaction? Anxiety? Excitement? Meh? You've looked up information before, and maybe you feel you are pretty good at it. But what's the point of repeating back information that the professor surely already knows (or can look up)? Your professor goes on to talk about research as "a process of discovery." It turns out that your professor's use of the word research involves more than locating or summarizing basic information. The goal is to explore areas where knowledge is not settled and draw your own conclusions. This approach to research is known as **original research**, and it is the focus of this book.

It almost goes without saying, even if you know little about the particulars of original research at this point, that this approach is more demanding than repeating facts or accepted ideas. There is a process to conducting research this way, which can be time-consuming and unpredictable. Originality in research is necessarily the result of sustained exploration and careful reflection over time, not flashes of inspiration or small concentrated bursts of effort.

Accordingly, original research is a form of what educators refer to as **experiential learning**: You learn by doing, by engaging in a process of discovery, even though the uncertainty can be challenging. Your project emerges in time, and through your persistence, you gain knowledge and skills that you then bring to future efforts. The path to the end goal usually has many curves and even detours, but you are able to respond to these obstacles by applying acquired techniques to the various situations you encounter. Experiential learning involves trial and error, where every challenge you encounter is an opportunity to grow and improve. Research is also a recursive process, meaning sometimes you have to return to earlier stages in order to then move ahead with more confidence. You've no doubt learned from experience before, such as when playing sports or a musical instrument, and you'll continue to learn from experience long after you leave college.

The original research that college students perform is called **undergraduate research**. Scholars who study higher education practices have shown that undertaking undergraduate research increases students' self-confidence and helps them become more independent while developing skills in collaboration and communication. These benefits are valuable in any field of study or career. In addition, your original research experiences don't need to occur in courses in your major to have these impacts. There is good reason to seek such experiences early and often. During your undergraduate studies, there may be opportunities to work alongside professors in their research pursuits—most professors are engaged in research when not teaching classes, often alongside undergraduate and graduate students, especially in fields in the sciences and social sciences. When students get to the final courses in their majors, they are often asked to complete an original research project in their discipline either by themselves or with peers, so it pays to have already had practice. Students learning trades or specializing in the arts frequently demonstrate experiential learning by producing creative work or practical models. This project-based learning prioritizes originality in much the same way as undergraduate research. You can think of original research as helpful preparation for

any career because “learning on the job” is experiential learning, and you’re bound to encounter new challenges in the workplace or when freelancing.

Experiential Learning Is Transformative Learning



One of the example sources in this book, “The Benefits of Undergraduate Research, Scholarship, and Creative Activity” by Jeffrey M. Osborn and Kerry K. Karukstis (Appendix A.1), gives you the opportunity to learn more about undergraduate research as a form of experiential learning. Experiential learning requires engagement beyond reading textbooks, listening to lectures, and taking exams. Osborn and Karukstis regard undergraduate research and other forms of experiential learning as “transformational experiences” (p. 216). Such experiences involve a significant shift in one’s understanding of the world around them, challenging one’s assumptions and opening up new possibilities for action. When students have such experiences, they no longer see a college education as a series of courses; they are more likely to seek out and participate more fully in a wide range of opportunities for personal and professional development available to them, even beyond the classroom.

Undergraduate research is just one practice among many that offers the educational advantages of experiential learning. Many students come to college having heard that an internship can help them launch their careers. Internships and other experiences with real-world employers are indeed forms of experiential learning if they involve structured reflection and mentoring. Service-learning courses are another example, where students work with partners such as nonprofit organizations to address community needs. Service experiences connect classroom learning with engagement in the community so that students can apply ideas from readings and discussion to real-world situations that they see for themselves.

Experiential learning is meant for all college students, not just for those in certain majors or special programs (although some majors and programs do emphasize experiential learning more than others), because it helps students gain many practical skills and work in teams. Applying that same thinking to undergraduate research, it’s not meant to be a “one and done” assignment—it’s engagement in a life-changing process!

1.2 Research as a Conversation

It’s commonly said that research is like a conversation. This metaphor holds true in many ways. Research involves the contributions of many participants, all of whom share a common interest that inspires their engagement. This conversation among researchers can take place over a long period of time, and it is sustained when scholars publish new findings or insights, expanding into fresh territory as a result. Conversation literally occurs when academics in the same field of study come together at a conference to present their research.

However, there's a big difference between a conversation where the participants come together with a common interest and one where common ground must be established. Imagine that you have started playing a new video game and want to tell people about it. Compare a conversation with your friends, who are also avid gamers, to a conversation with your aunt, who is not a gamer in the least. Think about how the conversation with your friends will allow you to go into greater depth because you can take their familiarity for granted. The conversation with your aunt may focus less on the specific game and more on why video games in general are worthwhile. If you did want your aunt to understand this particular game, you would need to go through all the basics, which would bore your friends because they already know them.

Academic research—scholars communicating with other scholars—resembles the conversation with your friends rather than the conversation with your aunt. Though you might enjoy sharing your interest with your aunt, you can go deeper in discussing the subject with your friends, who are already on the same page as you. So, in order to engage in academic conversations, you have to become familiar with other scholars' common interests and be able to acknowledge and respond to them.

While it certainly takes time to become fluent in a field of study, sometimes students think that they need to seclude themselves for years before finally emerging and participating in an academic conversation. This logic misses the point of the engagement. It isn't to impress other people with the knowledge you have mastered. Think about how engaging in a discussion could help you understand the common interest better, even if you're just a beginner. Take the video game example: You could make friends with someone who has just started playing the game and could get her interested in the challenges in upcoming levels. Or, if you're the one who is new to the game, maybe you have a different and intriguing perspective to add based on other games you have played. This is all to say that sometimes we overestimate what is needed to engage. Curiosity and interest sustain the conversation.

1.3 Original—To Whom?

You may have heard someone say, usually pessimistically, that there's no such thing as originality: Somebody somewhere must have already said or done a thing, or everything that seems new is just a recombination of what has been done before. There is an element of truth to this idea, but it is important to remember that originality is relative. In terms of research, you may learn a piece of information that is new to you, but is it new to others? Or you may come to realize something—for example, that advertising shapes our notion of body image—but this general idea may turn out to be very common.

Relative originality can be difficult to measure. Small advancements can be original too, not just revolutionary breakthroughs. If you are performing research in a particular field, you will be better prepared to recognize relative originality. You can consider the scholars

who study a specific subject and ask, What would they already know? What are they actively trying to understand better? You can answer these questions at the outset of your process. You'll find that the experts within a field have particular interests that determine what makes research valuable and original to them: An interpretation of a novel that no one else has shared is original to a literature scholar, and evidence of an unacknowledged side effect of a medication would be valuable new knowledge to a pharmacist. The boundaries of fields are sometimes ambiguous, and there are smaller fields that exist within larger ones. These factors make judgments of relative originality more complicated, specifically for beginning college students. For example, universities are often divided into disciplines, which roughly correspond to academic departments (the Department of Biology), and the faculty working within them have various specializations (biochemistry)—some that may even overlap (biochemistry relies on knowledge from biology and chemistry).

Thus, there is a relationship between being aware of your intended audience and being able to size up the originality of your research. An **intended audience** consists of the people an act of communication is meant to reach, and it influences how a writer expresses their message. In the real world, we make appropriate adjustments when communicating to a recognizable audience. For example, if you are making a toast at a wedding reception, your audience would be the friends and family of the newly married couple, and humor may be appropriate in that situation. If you are preparing a presentation for class, however, you may need to balance the seriousness of the material with effective public speaking strategies; and if you're writing a research paper, your intended audience (your professor and possibly other academics) likely calls for a formal tone, and you will need to pay attention to certain conventions and expectations. In many early college courses, especially those focused on skills such as academic writing or public speaking, which fall outside of a specific discipline, your audience may be difficult to determine. Your immediate audience is your professor or mentor, but most instructors or mentors want you to envision an audience that is more than a single reader—as researchers regularly do.

You can conceive of a general audience made up of people who are not experts but are still well-informed and interested in originality. Perhaps these folks can best be described as “educated” and “curious.” These are people who have likely benefited from higher education, and more importantly, they *want* to be introduced to new insights and perspectives. (Books, articles, and other texts that are original but not intended for experts are called substantive, a term that will be explored further in upcoming chapters.) You have to be careful not to assume this audience knows everything about a given topic, but you can also take for granted that they are not complete beginners.

You can and should strive to inform this audience about what is original in your research and why, rather than assuming that they will recognize originality all on their own. Your audience will appreciate this transparency, and this book will show you how to communicate the newness of your discoveries to your readers. In any context in which you are pursuing original research, it's a valuable skill to be able to make your relative originality apparent to others. Being aware of and responsive to your audience are strengths of successful communicators.

Nothing New?



You may be wondering if there is any research that is inherently original, that wouldn't require you to think in terms of audience perceptions of newness. You could explore a subject no one has before—itself unlikely—or design and conduct a completely new experiment to see what happens. Still, you would need to have some familiarity with experiments that have already been performed or knowledge about similar topics to confirm that no one has done the same. When sharing the findings of a new experiment, or interviewing someone for the first time, you would need to contextualize your insights by referencing what has been studied or is already known. Experimental research is a regular part of undergraduate learning (introductory science labs, for instance), but the focus is usually on practicing processes and demonstrating that the results (and by extension a particular understanding) are consistent and replicable. So experimental research isn't necessarily original either, since it may be performed for confirmation. These examples show that there is no substitute for learning the knowledge already affirmed by others. New experimental research, which we'll call primary research, may be a part of an original research effort, but it doesn't have to be. Originality may arise from information and insights from secondary texts (texts that use evidence from other published texts in addition to or instead of primary research) that a scholar brings together or combines in new ways. (What determines when research and texts are primary or secondary will be discussed further in Chapter 3.) Also, scholars may draw different conclusions from the same findings, even the objective results of an experiment. This book is not about how to design an experiment or conduct an interview; it focuses on using secondary texts to arrive at original research.

1.4 Inquiry: Curiosity with Purpose

The term **inquiry** refers to a deeper curiosity that pushes one to go beyond repeating established knowledge. Sometimes there is something we want to know, such as how evaporation works or how to cook a certain dish, and we can simply look up the answer and find out. We obtain the piece of information, and then we are satisfied. That's not original research—that's just referencing. There's no conversation to be had. An inquiry takes us into territory where there's no existing answer to the questions we ask. We are intrigued by the fact that there is something yet to learn or curious about something unsettled that we might come to understand better.

Research consisting of reference work does increase our knowledge, but what we learn is widely understood and just as easily accessible to others. Original research results in new knowledge. For example, maybe someone is environmentally conscious and considering purchasing an electric car, but they don't know much about how these cars work or what

makes them better for the planet than cars that run on gasoline. This person could spend a short amount of time searching the web and find the facts that will make them more informed about electric vehicles and their impact on the environment. But this would not be original research because it doesn't result in a discovery that constitutes new knowledge. This does not mean that original research can't be performed on the topic of electric cars. We might ask ourselves why electric cars aren't more common today, and after looking into this issue, we might notice limitations in our road infrastructure or the technology electric cars depend on, namely batteries. Those are lines of inquiry that open up possibilities for original research.

This book will center on formulating specific, pointed research questions as the best way to express what you seek to discover through original research. You will learn that certain types of questions resonate with an academic audience because they lead researchers to meaningful new answers. While you might want to know if there is life on other planets or what the future might bring in terms of economic prosperity for your country, these don't make viable research projects because they are too broad and speculative. It's hard to see how these inquiries would extend what we already know or help us understand a subject better. Over the course of decades, they might, but it's more likely that scholars would approach these concerns by asking a series of smaller, narrower questions, the answers to which might then be brought to bear on these larger general questions.

Research may be performed in the service of problem-solving too. Yet if we deem an issue a "problem"—say, food insecurity among those living in subsidized housing—we might fixate entirely on how unacceptable and in need of improvement it is, which can detract from exploring the actual circumstances. Writing a paper or giving a presentation on "what should be done," which can tend toward idealism and hypothetical thinking if we aren't careful, shouldn't be confused with actually achieving that outcome. Scholarship recommending a way forward is indeed much different from a coordinated effort to act upon research insights. It takes time and the involvement of many people, including politicians and those committed to investing time and money to make things better, to use knowledge to bring about change.

So, with original research, one's first responsibility is to offer a better understanding, which in and of itself is a valuable outcome—one that matters right now and not only once things change. We can, for instance, gain new insight into what makes food insecurity persistent in certain communities, and we benefit immediately from that increased awareness, regardless of how we act upon that knowledge. The point isn't that original research is not practical or cannot be action-oriented; it's that new insights must first be confirmed before they can be applied to solutions and predictions and in turn prompt collective change. It's important to recognize that researchers are simply one group of actors in a larger system, a system that could be said to center on the production and circulation of knowledge in a culture.

The Purpose of Research



There are many reasons for conducting original research, from finding efficient solutions to everyday difficulties to attempting to change the world. On occasion, research is driven by a desire for notoriety or financial gain, but the drive toward originality still usually plays a part in researchers' activities, despite what additional motives they may have. Researchers tend to want to explore situations that haven't been studied and to seek out new findings and novel applications—and it is this research that we concern ourselves with in this book.

Participatory action research is an example of socially engaged discovery: At every step of the way, researchers collaborate with those who ultimately benefit from the research. For example, researchers studying solutions to food insecurity might partner with food pantries and interview the people they serve, identifying their needs and then designing research efforts that involve these people to address priorities for change. Obviously, the shape of this research differs significantly from the work of data-minded scholars interpreting existing statistical information. Yet either approach can be thought of as different means toward the same end, and participatory action research out in the community can build on research performed in the library and vice versa.

This book's main intention is to get you to appreciate the purpose of research in broad conceptual terms. You may not be able to try out a variety of research approaches at this point in your education, but as you pursue your interests and specialize more, you should have more opportunities to do so—and familiarizing yourself with the “big picture” objectives of original research will prepare you to make the most of those experiences.

1.5 What Makes Research Original: Three Kinds of Knowledge

You may have already guessed that original research is not original forever. There is a life cycle to knowledge, so to speak. New discoveries eventually become accepted as accurate, true, and stable understandings. The life cycle goes as follows: First, scholars share original research in their scholarship. Then, over time, experts working in fields of study come to either validate certain findings or leave behind the research they deem inadequate, inaccurate, or incorrect. In other words, a consensus forms around the best and most complete understandings. After even more time passes, some of these findings will become established knowledge—that is, knowledge that is widely known and accepted beyond the fields of study.

It's helpful to make two further distinctions among forms of established knowledge. **Common knowledge** is knowledge that is so widely accepted as true that it's no longer attributed to individual researchers. It includes simple matters of fact that cannot be disputed and can be easily verified, such as the year a leader died. **Specialized information** is knowledge that experts agree on but is not yet general and public. For example, those skilled

in pottery would know a lot about glazes and how to use them, but the average person would not. If your intended audience is made up of experts, you can assume that they are already familiar with the specialized information in their field or area of interest. In addition, specialized information can become common knowledge over time. But before this transition can happen, the experts who are invested in the subject must already begin to form a consensus. The medical field may come to embrace a treatment based on published original research, yet for years, the general public might not be aware of this information. Specialized information, then, consists of information and insights that are on the way to becoming commonly accepted but which most nonexperts would consider new.

Because new insights build on established knowledge, it's unlikely that you will find only one type of knowledge by itself. In scholarship, experts reference specialized information to show how their findings echo, extend, and sometimes challenge existing ideas. When seeking established knowledge on a subject, you'll usually find common knowledge alongside specialized information. For example, a text such as an encyclopedia entry will cover both common knowledge and specialized information that is well on the way to becoming widely accepted. You can see then that if you don't pick up on how established knowledge is presented in a text, whether an article on Wikipedia or a recent academic journal article, you could mistake its specialized information for original research. This causes difficulty for you as a researcher because you'll have trouble recognizing the paths that can lead you to your own original findings. So you must cultivate an awareness of the kinds of knowledge you're encountering at the same time that you gather information. It's not an easy task, though this textbook will offer you many tips to help you identify originality. Take a historical event, for instance. Describing what happened can be done in a factual way that everyone can accept as correct ("What macroeconomic failures arose during the Great Depression?"). Interpreting what caused an event can in many cases be something there is consensus about ("What were the main causes of the Great Depression?"). But even so, we continue to study and discuss significant moments in the past to find ways to make our understanding of history more complete. Historians examine factors never considered before or acknowledge known factors but study them in fresh ways, drawing new conclusions about how and why these moments unfolded and why they continue to matter.

Below is a visual representation of the three different kinds of knowledge, with two trajectories mapped through them. If your goal is to pursue new insights, the ideal research process would start with common knowledge, much of which you might already have, and then move into specialized information before arriving at original research. You can think of the purple arrow as the flow of conducting original research. Original research builds on specialized information, and you may not grasp what makes research original without first familiarizing yourself with specialized information as a point of contrast. Over time, there will not necessarily be more and more original research piling up, because original research doesn't stay new forever. There is the opposing trajectory of consensus building: Original research, after it is shared, will eventually become specialized information when experts agree it is correct, and in time specialized information will turn into common knowledge. The red arrow represents

the gradual acceptance of original research over time. However, some original research will be abandoned or replaced on the way to becoming specialized information, and some specialized information may remain known primarily to experts indefinitely, as long as it is too complex or too impractical to become accepted as common knowledge.

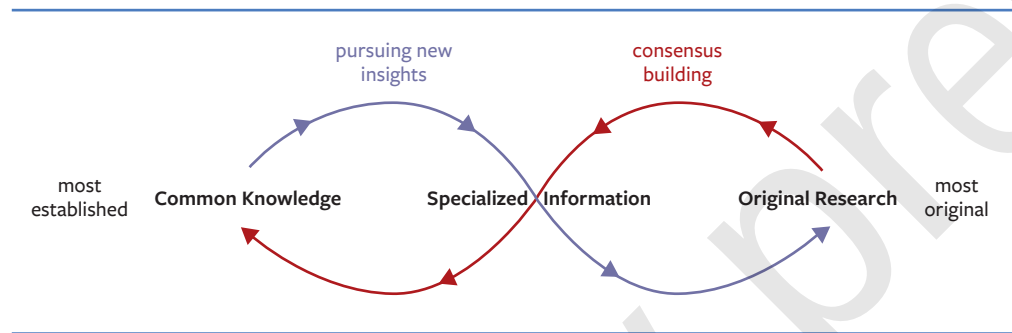


FIGURE 1.1 Three Kinds of Knowledge

1.6 Sharing Original Research

Originality in research is incremental. It builds upon specialized information as well as common knowledge. Original research is inherently valuable to scholars because it offers insights or discusses issues that they perhaps haven't fully considered. It enlarges or revises the knowledge they already have. This is one way that research can be said to be significant. It has the potential to expand and reshape established consensus knowledge over time: What was once original research will eventually become specialized knowledge that all experts accept, and some specialized knowledge will even become core common knowledge.

Discoveries often occur when researchers take notice of something that was previously unremarkable or bring together ideas or texts that were never combined before. When thinking about great breakthroughs, people tend to be attracted to the sudden flashes of insight without acknowledging how the ground was prepared by earlier research or considering what future possibilities previous discoveries opened up. Before the invention of the microscope, scientists didn't know what cells were. Two hundred years later, scientists built on their knowledge of cells to discover bacteria and viruses, which replaced earlier thinking about the causes of diseases. We can't see these microscopic things with the naked eye, but this taken-for-granted information now informs our attitudes toward preventing the spread of illness. Of course, we continue to study bacteria and viruses today, especially how they evolve, sometimes in response to real-life outbreaks.

The incremental development of knowledge over time cannot happen without original research being shared. That means that researchers must arrive at some conclusions, even if

they are tentative or provisional. Scholars are usually not concerned with having the last word: They accept that researchers who come after them might arrive at different findings, especially when more can be learned with additional time or when conditions change.

College professors commonly assign essays so that students can share the conclusions they reached through research. Written communication is the foundation of the scholarly enterprise as well. Yet among instructors who teach writing, there is a growing awareness that a paper doesn't need to be the sole outcome of students' research. In some disciplines, presenting research at conferences by giving a talk or sharing a poster is as important as publishing one's findings in a journal article. And whatever career you are pursuing, you should recognize that research is still performed by employees of all types and levels and shared among teams. In a workplace setting, sharing research rarely involves exchanging written essays with coworkers. Accordingly, this book does not assume that students' **research products**—the texts they create to share their research findings—are going to take a particular form or will necessarily be expressed in writing.

That said, scholars tend to write arguments to convey their research findings. This book, however, doesn't cover the formal features of arguments, which are usually assumed to be offered in writing (though they really don't have to be). Instead, it emphasizes that presenting one's research findings is argumentative: Researchers must make a case for their conclusions being *new* and *better* understandings. As mentioned above, this requires that you assist your audience in recognizing what makes your research original—you must argue for your originality, in other words.

Multimodality



Language—that is, the use of words in speech or writing—is not the sole means by which we share research findings. Communication can be divided into different modes: written, spoken, visual, aural, gestural, and spatial. Research articles frequently contain data visualizations, and the layout of every printed text contributes to the meaning that it conveys. (This paragraph is an example of the spatial mode because it has been placed in a frame to separate it from the main text, marking each as having a different status in relation to the other.) Some research products are inherently **multimodal**—that is, a combination of more than one mode of communication. When giving a presentation in person in front of an audience, you combine three modes: spoken (your words delivered in speech), visual (slides or another visual aid), and gestural (your physical presence and movement). If you record the presentation, you may be able to take advantage of the aural mode by adding background music and sound effects. This book includes a sample presentation (Appendix B.2) and a sample research poster (Appendix B.3) that are both multimodal, like most research products that aren't traditional essays.

key terms and takeaways



Original research doesn't repeat established knowledge but aims to uncover new or better understandings, especially by exploring areas where there is not yet consensus. It extends the conversation on a subject by recognizing what is already known and then building on or diverging from established knowledge.

Undergraduate research is the term for the research process performed by college students that enacts **experiential learning**, or learning by doing. Students try out techniques to address new challenges and develop methods that can be applied in future situations.

Identifying an **intended audience**, the group expected to receive research findings, can help researchers recognize and call attention to the relative originality of their findings and why they should matter to others.

Inquiry is a question-centered approach to research, channeling your curiosity to answer open-ended questions. The answers discovered through original research should represent definite conclusions that may be shared with others.

Common knowledge and **specialized information** are both forms of established knowledge that are accepted as true. Common knowledge is information that most people already know or can verify in any reference work. Specialized information represents the consensus of experts within a field or area of interest.

Researchers' efforts culminate in **research products** that can take many forms. Writing is just one mode of communication for sharing research. Products that combine writing with other means of communication, such as visual or spoken modes, are known as **multimodal**.

putting learning into practice



1. What is a topic of conversation that you could take up with your friends and assume that they already know a lot about it? If you brought up this same topic with someone who isn't already familiar with it, what would you need to explain to them in order to create the conditions for a rich conversation?
2. Think about a genre that you enjoy and experience frequently, such as superhero movies, psych music, or young adult fiction. What was a feature of one of these texts that you once thought was especially creative but later learned had already been done? How did this change your thinking about originality going forward?

3. The learning experiences undergraduates have when doing research are thought to be transferable, meaning they will apply to many other situations inside and outside of college. Do you agree with this? Why or why not? What are other and perhaps better examples of transferable learning?
4. What was a question that you recently tried to find an answer to? What prompted this question, and how did you seek an answer? Would this be considered inquiry or original research? Why or why not?