**Lesson 08: plan in scientific research**

**-Part 02-**

**1-Steps of the Research Plan:**

**Step 1: Orient yourself:**

Planning and conducting research requires you to make a transition, from thinking like a consumer of information to thinking like a producer of information. That sounds simple, but it’s actually a complex task. As a practical matter, this means putting aside the mindset of a student, which treats knowledge as something created by other people. As students, we are often passive receivers of knowledge: asked to do a specified set of readings, then graded on how well we reproduce what we’ve read.

Researchers, however, must take on an active role as knowledge producers. Doing research requires more of you than reading and absorbing what other people have written: you have to engage in a dialogue with it.

That includes arguing with previous knowledge and perhaps trying to show that ideas we have accepted as given are actually wrong or incomplete. For example, rather than simply taking in the claims of an author you read, you’ll need to draw out the implications of those claims: if what the author is saying is true, what else does that suggest must be true? What predictions could you make based on the author’s claims?

In other words, rather than treating a reading as a source of truth – even if it comes from a revered source, such as Plato or Marie Curie – this orientation step asks you to treat the claims you read as provisional and subject to interrogation. That is one of the great pieces of wisdom that science and philosophy can teach us: that the biggest advances in human understanding have been made not by being correct about trivial things, but by being wrong in an interesting way. For example, Albert Einstein was wrong about quantum mechanics, but his arguments about it with his fellow physicist Niels Bohr have led to some of the biggest breakthroughs in science. [[1]](#footnote-2)

**Step 2: Define your research question:**

Students often give this step cursory attention, but experienced researchers know that formulating a good question is sometimes the most difficult part of the research planning process. That is because the precise language of the question frames the rest of the project. It’s therefore important to pose the question carefully, in a way that’s both possible to answer and likely to yield interesting results. Of course, you must choose a question that interests you, but that’s only the beginning of what’s likely to be an iterative process: most researchers come back to this step repeatedly, modifying their questions in light of previous research, resource limitations and other considerations.

Researchers face limits in terms of time and money. They, like everyone else, have to pose research questions that they can plausibly answer given the constraints they face.

In addition to being interesting to you, and feasible within your resource constraints, the third and most important characteristic of a ‘good’ research topic is whether it allows you to create new knowledge. It might turn out that your question has already been asked and answered to your satisfaction: if so, you’ll find out in the next step of this process. On the other hand, you might come up with a research question that hasn’t been addressed previously. Before you get too excited about breaking uncharted ground, consider this: a lot of potentially researchable questions haven’t been studied for good reason; they might have answers that are trivial or of very limited interest.

Finally, scholarly research questions must in some way lead to new and distinctive insights. For example, lots of people have studied gender roles in sports teams; what can you ask that hasn’t been asked before? Reinventing the wheel is the number-one no-no in this endeavour. That’s why the next step is so important: reviewing previous research on your topic. Depending on what you find in that step, you might need to revise your research question; iterating between your question and the existing literature is a normal process. But don’t worry: it doesn’t go on forever. In fact, the iterations taper off – and your research question stabilises – as you develop a firm grasp of the current state of knowledge on your topic. [[2]](#footnote-3)

**Step 3: Review previous research:**

In academic research, from articles to books, it’s common to find a section called a ‘literature review’. The purpose of that section is to describe the state of the art in knowledge on the research question that a project has posed. It demonstrates that researchers have thoroughly and systematically reviewed the relevant findings of previous studies on their topic, and that they have something novel to contribute.

Your own research project should include something like this, even if it’s a high-school term paper. In the research planning process, you’ll want to list at least half a dozen bullet points stating the major findings on your topic by other people. In relation to those findings, you should be able to specify where your project could provide new and necessary insights. There are two basic rhetorical positions one can take in framing the novelty-plus-importance argument required of academic research:

* Position 1 requires you to build on or extend a set of existing ideas; that means saying something like: ‘Person A has argued that X is true about gender; this implies Y, which has not yet been tested. My project will test Y, and if I find evidence to support it, that will change the way we understand gender.’
* Position 2 is to argue that there is a gap in existing knowledge, either because previous research has reached conflicting conclusions or has failed to consider something important. For example, one could say that research on middle schoolers and gender has been limited by being conducted primarily in coeducational environments, and that findings might differ dramatically if research were conducted in more schools where the student body was all-male or all-female.

Your overall goal in this step of the process is to show that your research will be part of a larger conversation: that is, how your project flows from what’s already known, and how it advances, extends or challenges that existing body of knowledge. That will be the contribution of your project, and it constitutes the motivation for your research.

Two things are worth mentioning about your search for sources of relevant previous research. First, you needn’t look only at studies on your precise topic. For example, if you want to study gender-identity formation in schools, you shouldn’t restrict yourself to studies of schools; the empirical setting (schools) is secondary to the larger social process that interests you (how people form gender identity). That process occurs in many different settings, so cast a wide net. Second, be sure to use legitimate sources – meaning publications that have been through some sort of vetting process, whether that involves peer review (as with academic journal articles you might find via Google Scholar) or editorial review (as you’d find in well-known mass media publications, such as The Economist or The Washington Post). What you’ll want to avoid is using unvetted sources such as personal blogs or Wikipedia. Why? Because anybody can write anything in those forums, and there is no way to know – unless you’re already an expert – if the claims you find there are accurate. Often, they’re not. [[3]](#footnote-4)

**Step 4: Choose your data and methods:**

Whatever your research question is, eventually you’ll need to consider which data source and analytical strategy are most likely to provide the answers you’re seeking. One starting point is to consider whether your question would be best addressed by qualitative data (such as interviews, observations or historical records), quantitative data (such as surveys or census records) or some combination of both. Your ideas about data sources will, in turn, suggest options for analytical methods.

You might need to collect your own data, or you might find everything you need readily available in an existing dataset someone else has created.

Because your task at this point is to plan research, rather than conduct it, the purpose of this step is not to commit you irrevocably to a course of action. Instead, your goal here is to think through a feasible approach to answering your research question. You’ll need to find out, for example, whether the data you want exist; if not, do you have a realistic chance of gathering the data yourself, or would it be better to modify your research question? In terms of analysis, would your strategy require you to apply statistical methods? If so, do you have those skills? If not, do you have time to learn them, or money to hire a research assistant to run the analysis for you?

Be aware that qualitative methods in particular are not the casual undertaking they might appear to be. Many people make the mistake of thinking that only quantitative data and methods are scientific and systematic, while qualitative methods are just a fancy way of saying: ‘I talked to some people, read some old newspapers, and drew my own conclusions.’ Nothing could be further from the truth.[[4]](#footnote-5)

**2-Circle back and consider revising your initial plans:**

As you work through these four steps in planning your project, it’s perfectly normal to circle back and revise. Research planning is rarely a linear process. It’s also common for new and unexpected avenues to suggest themselves. As the sociologist Thorstein Veblen wrote in 1908 : ‘The outcome of any serious research can only be to make two questions grow where only one grew before.’ That’s as true of research planning as it is of a completed project.

### Key points :

**Planning a research project is essential no matter your academic level or field of study.** There is no one ‘best’ way to design research, but there are certain guidelines that can be helpfully applied across disciplines.

**Orient yourself to knowledge-creation.** Make the shift from being a consumer of information to being a producer of information.

**Define your research question.** Your question frames the rest of your project, sets the scope, and determines the kinds of answers you can find. [[5]](#footnote-6)

**Review previous research on your question.** Survey the existing body of relevant knowledge to ensure that your research will be part of a larger conversation.

* Literature review should be in paragraphs – containing only the main juice of the study. ( author, year of work, area of the study, place/ industry, findings and suggestions of the author/s ).[[6]](#footnote-7)

**Choose your data and methods.** For instance, will you be collecting qualitative data, via interviews, or numerical data, via surveys?

**Circle back and consider revising your initial plans.** Expect your research question in particular to undergo multiple rounds of refinement as you learn more about your topic.[[7]](#footnote-8)

1. Brooke Harrington: **How to plan a research project,** https://psyche.co/guides/how-to-plan-a-research-project-in-four-clear-steps [↑](#footnote-ref-2)
2. Brooke Harrington: **How to plan a research project,** https://psyche.co/guides/how-to-plan-a-research-project-in-four-clear-steps [↑](#footnote-ref-3)
3. Brooke Harrington: **How to plan a research project,** https://psyche.co/guides/how-to-plan-a-research-project-in-four-clear-steps [↑](#footnote-ref-4)
4. Brooke Harrington: **How to plan a research project,** https://psyche.co/guides/how-to-plan-a-research-project-in-four-clear-steps [↑](#footnote-ref-5)
5. Brooke Harrington: **How to plan a research project,** https://psyche.co/guides/how-to-plan-a-research-project-in-four-clear-steps [↑](#footnote-ref-6)
6. J Wilfred Angello Gerald: **A Topographic outline of Research Methodology** , Research Department of Human Resource Management ST.Joseph’s College [↑](#footnote-ref-7)
7. Brooke Harrington: **How to plan a research project,** https://psyche.co/guides/how-to-plan-a-research-project-in-four-clear-steps [↑](#footnote-ref-8)