



Definition of Research

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In the broadest sense of the word, research includes any formal gathering of data, information and facts for the advancement of knowledge.

Consider the following activities. Which do you think counts as “research”?

- Reading a book
- Surfing the internet
- Reading a Wikipedia article
- Watching people in an airport
- Conducting an interview
- Listening to the news
- Reading a journal article
- Going to a museum
- Watching a YouTube video
- Consulting a dictionary

As you read the above list, perhaps you thought, “it depends.” A Historian may be interested in a museum visit or dictionary definitions, but an experimental biologist would reject all of these as valid research sources except for the journal article. Wikipedia may be a good resource for early on in a literature review to give an outline, and a book may be more or less valuable as a resource depending on who it was written by and when.

Research is conducted according to the researcher’s intention, their purpose, and the paradigm they’re operating from within. While many people use the word “research” to loosely mean “gathering information” scientists use this word in a more specific way.

The term “research” in a scientific context usually refers to the entire scientific method from start to finish. The information gathering portion of the scientific method is more properly called a “review.”

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A Scientific Review

Most literature reviews [1] describe the learning process of discovering and documenting all that is already known about a particular topic before attempting to add to it. Many research students are told that they need to find a “gap in the literature” and formulate a research question according to that niche.

But in more organic research, the idea is that a scan of the available data on an aspect of science would reveal unanswered questions and point to avenues that remain unexplored. This can be done by considering limitations or inconsistencies in previous research, or addressing conclusions made by others with a new take on the given data.

The experimental process [2] begins with casting a wide net to gather all relevant material, and then gradually works to refine from that data a research question that will later become a hypothesis.

The strict definition of scientific research (i.e. the scientific method) is performing a methodical study in order to prove or disprove a hypothesis [3], or answer a specific question [4]. But to arrive at that hypothesis takes some understanding of what is known in the area already. Research [5] can then follow a series of steps [6] and the standard protocol of experiment [7], depending on the conventions of that field of science.

In reality, the steps outlined above are not so discrete. Most research, whether scientific, economic or historical, requires some kind of interpretation and an opinion from the researcher from the very beginning. In other words, the researcher conducts a literature review with some pre-conceived idea of a hypothesis. This vague notion of the hypothesis then shapes the kind of information the researcher looks for.

Having a firm idea of what you’re looking for before you find it is not usually a problem so long as you take care to avoid confirmation bias and be sure to also seek information that *doesn’t* support your hypothesis.

Many students have wasted hours on research projects that should never have been started in the first place. A more thorough and impartial review would have told them that their project

had already been done, or that the new approach they believed they were undertaking is actually well explored elsewhere, only in search terms they didn't think to use in their literature review.

This is why it's crucial to start any experiment with a mind as open as possible, so that you don't embark by unwittingly excluding information that could have disproved your hypothesis right from the start.

The scientific definition of research [8] generally states that in an experiment, a variable [9] must be manipulated [10]. Qualitative research, however, may rely on case studies [11] and purely observational science [12], and this approach has its own merits and drawbacks.

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Links

- [1] <https://explorable.com/what-is-a-literature-review>
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