

THE IDEA LIFECYCLE

THE PATH FROM IDEAS TO FACTS IN RESEARCH

Social media has an influential role in promoting research today, which is both good and bad. Also, the push for more "open" (generally, free to access) research has led to new ways of publishing and sharing. More openness can help make research more transparent and replicable, which can help make research stronger.

SHARE 7

Libraries acquire journals for sharing. Other organizations catalogue research to make sure it's discoverable and safely preserved. Research is also shared through media and conferences. This sharing benefits both research and society. **KEY PEOPLE:** Librarians, publishers, indexers, journalists, advocates.

CONFIRM 8

Unless tests and calculations can be repeated, researchers can't know for certain if a study's conclusions are correct. New studies might be needed, or the study data might need to be reexamined by other experts. This "final" stage of research is often heated as researchers seek out the truth. **KEY PEOPLE:** Researchers.

1 THINK

After many years of education and training (generally PhDs), researchers develop a deep understanding of a narrow field. With this understanding, they might choose to explore novel ideas, confirm previous studies, or even search for solutions to societal needs. Not all research involves labs and experiments. **KEY PEOPLE:** Researchers, universities.

Researchers seek out facts. This is not the same collecting "evidence" that confirms a particular point of view. Facts are objective, can be confirmed by others, and can withstand scrutiny and be refined over time. Most fact-seeking takes small steps, confirming and extending proven ideas. "Break-throughs" are exciting, but not the norm.

2 DESIGN

How should an idea be tested? Studies need to be cleverly and carefully designed. Standard elements are a description of how a study is connected to existing facts, how it will be conducted, what will be measured and how, and what resources will be needed. **KEY PEOPLE:** Principal investigators (PIs), funders.

PUBLISH 6

Most university research gets published in journals; much non-university research does not. Prestigious journals have high rejection rates and publish only the best, highest quality work. About 3.5 million articles are published every year in 40,000 journals. **KEY PEOPLE:** Publishers, authors, editors, scholarly societies, universities, funders.

There is constant debate in research about the methods and conclusions of studies. This debate is a crucial part of how our knowledge improves. There is also much tension about "publish or perish," where university researchers are judged by how many journal articles they write.

REVIEW 5

Research review takes many forms. Peer review is where other experts make critical comments about the study. Conferences and preprint publishing are other ways research gets reviewed. The goal is to improve research quality. **KEY PEOPLE:** Reviewers, editors, researchers.

4 STUDY

Studies need to be conducted carefully. Not all studies are conducted with the same amount of care. Many steps happen here: collaboration, safety, data collection, analysis, writing, and more. **KEY PEOPLE:** Researchers, technicians, project managers, statisticians, review boards.

3 FUND

To get money (grants) to investigate an idea, a research idea has to be technically sound. Funding can be difficult to find, and the grant process is highly competitive. Different granting agencies have different funding priorities. **KEY PEOPLE:** Grant writers, government funders, philanthropies, industry.

Studies need to be carefully designed, justified, and conducted in order to receive grant funding and be accepted by other researchers. Quite often, good studies aren't funded. Studies also need to be "transparent" so researchers can follow along, debate conclusions, and later, confirm findings.