

.....

Given that theories and observations are the two pillars of science, scientific research operates at two levels: a theoretical level and an empirical level. The theoretical level is concerned with developing abstract concepts about a natural or social phenomenon and relationships between those concepts (i.e., build “theories”), while the empirical level is concerned with testing the theoretical concepts and relationships to see how well they reflect our observations of reality, with the goal of ultimately building better theories. Over time, a theory becomes more and more refined (i.e., fits the observed reality better), and the science gains maturity. Scientific research involves continually moving back and forth between theory and observations. Both theory and observations are essential components of scientific research. For instance, relying solely on observations for making inferences and ignoring theory is not considered valid scientific research.

Scientific inquiry may take one of two possible forms: inductive or deductive. In inductive research, the goal of a researcher is to infer theoretical concepts and patterns from observed data. In deductive research, the goal of the researcher is to test concepts and patterns known from theory using new empirical data

Conducting scientific research, therefore, requires two sets of skills – theoretical and methodological – needed to operate in the theoretical and empirical levels respectively. Methodological skills (“know-how”) are relatively standard, invariant across disciplines, and easily acquired through doctoral programs. However, theoretical skills (“know-what”) is considerably harder to master, requires years of observation and reflection, and are tacit skills that cannot be “taught” but rather learned through experience.

Work to do:

- Give a title to the text
- Read the text above.
- What are the main ideas?
- Summarize the text.