

Summary of AK2030 Theory and Methodology of Science

Yashar Honarmandi
yasharh@kth.se

27 oktober 2020

Sammanfattning

This is a summary of AK2030 Theory and Methodology of Science.

This course, rather than teaching any particular aspect of science, will focus on general methodological and epistemological issues when approaching problems in science.

Innehåll

1	General Philosophy of Science	1
2	Methodology	1

1 General Philosophy of Science

Knowledge Knowledge is true, justified belief.

Definitions Pertaining to Phenomena A phenomenon X is

- predicted if one can know at what time X will occur.
- explained if the causes of X are known.
- designable if it is known to satisfy certain properties.

2 Methodology

Methodology is the study of the design of methods for gaining knowledge. It is different from general philosophy of science in that it does not contain, for instance, comparison, choice and justification of methods.

Choice of Method To answer the question of what methods should be chosen, three approaches are typically found:

- The conventional approach, in which you choose the same methods as your teachers or peers.
- The outcome-oriented approach, in which you choose the method that gives the best results.
- The reason-based approach, in which you choose the method for which you have the overall best reasons. Reasons here means considerations of the method with respect to a set of goals that you want to achieve.

Their advantages and disadvantages may be summarized as follows:

Approach	Advantages	Disadvantages
Conventional	<ul style="list-style-type: none">• Makes choices easy	<ul style="list-style-type: none">• Leaves you less open to correcting methodological mistakes and being critical of your own results• Makes it hard to collaborate with others due to inflexibility
Outcome-oriented	<ul style="list-style-type: none">• Nada	<ul style="list-style-type: none">• Is too vague - what are the best results, for instance, and who judges this?• Science often involves long-term planning, so the optimal choice of method might be hard to know a priori
Reason-based	<ul style="list-style-type: none">• Flexible	<ul style="list-style-type: none">• Nada

Tabell 1: Advantages and disadvantages of approaches to method choice.