



Organization and planning of scientific research

Lecture 3

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What is research?

Research is a careful and detailed study into a specific problem, concern or issue using the scientific method



Steps of the research process

Step 1: Identify the Problem.

Step 2: Review the Literature.

Step 3: Clarify the Problem.

Step 4: Clearly Define Terms and Concepts.

Step 5: Develop the Instrumentation Plan.

Step 6: Collect Data.


Step 7: Analyze the Data.

Step 8: Write a report





OBJECT AND SUBJECT OF RESEARCHES


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- Object of research is a part of scientific knowledge researched by a scientist
 - Object describes the widest and general part of scientific research activity.
 - Object answers the following question:

What is under consideration?



Objects can be:

- Material object (for example, automobiles, devices, production wastes)
- Phenomenon (for example, combustion process of gas mixture in the engine cylinder)
- Properties (effectiveness of diesel combustion)

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- Subject of research is more detailed and narrow notion that is always a part of object.
 - Subject is a specific chosen problem considered under certain conditions
 - Subject answers the question:
How the object is considered?

AIMS OF SCIENCE

- develop inquiring minds and curiosity about science and the natural world,
- acquire knowledge, conceptual understanding and skills to solve problems and make informed decisions in scientific contexts
- develop skills of scientific inquiry to design and carry out scientific investigations
- communicate scientific ideas, arguments and practical experiences accurately in a variety of ways
- think analytically, critically and creatively to solve problems, judge arguments and make decisions in scientific contexts

Dissertation Aims and objectives

The primary focus of your research project is usually expressed in terms of aims and objectives.

Aim = what you hope to achieve.

Objective = the action(s) you will take in order to achieve the aim.

Aims are statements of intent. They are usually written in broad terms. They set out what you hope to achieve at the end of the project.

Objectives, on the other hand, should be specific statements that define measurable outcomes, e.g. what steps will be taken to achieve the desired outcome.



When writing your objectives try to use strong positive statements.

Strong verbs - collect, construct, classify, develop, devise, measure, produce, revise, select, synthesize

Weak verbs - appreciate, consider, enquire, learn, know, understand, be aware of, appreciate

- Aim of research is generally desired result of work
- It is what a researcher tries to achieve and what is expected as a result of conducted experiment
- Aim is not just to «*develop*» or «*create*», aim is an effect on the object obtained as a result and measured experimentally