Basic and Applied Research

Khagendra Kumar

Introduction

- Based on purpose or utility, a research approach can either be basic or applied. While basic research aims at expanding knowledge by creating new theories and modifying existing ones, applied research is focused on providing practical solutions to specific problems by analysing empirical evidence.
- There are several meeting and departure points for these approaches, and it is pertinent for every researcher to understand them effectively. In this article, we will be detailing some key differences between basic and applied research methods, while also highlighting some similarities between these research methodologies.

Basic Research

- Basic research is a research approach that is entirely theoretical and aimed at improving or expanding the knowledge-base of a particular field of study. It focuses on "knowledge for its own sake" and it is primarily driven by curiosity and the need to explore the unknown.
- It is also known as Fundamental/Pure research and it is a systematic investigation set to achieve a better and more detailed understanding of a research subject or phenomenon, not to solve a specific problem.
- Basic (fundamental or pure) research is driven by a scientist's curiosity or interest in a scientific question. The main motivation is to expand man's knowledge, not to create or invent something. There is no obvious commercial value to the discoveries that result from basic research.
- Most scientists believe that a basic, fundamental understanding of all branches of science is needed in order for progress to take place. In other words, basic research lays down the foundation for the applied science that follows. If basic work is done first, then applied spin-offs often eventually result from this research.

Applied Research

- Applied research is designed to focus on providing practical solutions to a specific problem. It is a form of investigation that entails solution-oriented inquiries into a phenomenon, a field of study or research subject generally employing empirical methodologies.
- In many cases, applied research is a follow-up research design for basic research because it further investigates the outcomes of pure or basic research in order to validate these findings and apply them to create innovative solutions to specific problems.
- Applied research is designed to solve practical problems of the modern world, rather than to acquire knowledge for knowledge's sake. One might say that the goal of the applied scientist is to improve the human condition.
- Some scientists feel that the time has come for a shift in emphasis away from purely basic research and toward applied science. This trend, they feel, is necessitated by the problems resulting from global overpopulation, pollution, and the overuse of the earth's natural resources.

Characteristics of basic vs applied research

Basic Research(BR)

- **focus on expanding knowledge; its theory-oriented.**
- **explanatory and analytical in nature.**
- **solution-specific and primarily concerned with the expansion of knowledge and not with the application of research findings**

Applied Research(AR)

- **focus on providing a practical solution to a defined problem; its practical-oriented .**
- **action-oriented and synthetic in nature**
- **focus of applied research; application of research findings**

Advantages of basic vs applied research

BR

- **Basic research results in the acquisition of new knowledge and it also expands existing knowledge**
- **responsible for breakthroughs in different fields of study; universal in nature**

AR

- **Applied research only focuses on applying knowledge to solve existing problems hence, it is solution-specific.**
- **Apply knowledge to solve existing problems hence, it is solution-specific; limited in nature**

BR

- simply focuses on expanding knowledge; no immediate concern for providing solutions to practical problems.
- findings from basic research may be found useful in solutions to problems later on.

AR

- Helps organizations and individuals to solve specific problems, unlike basic research that is simply focused on. creating new knowledge/ expanding knowledge.

Examples of

Basic research

- How did the life begin?
- What are protons, neutrons, and electrons composed of?
- How do earthworms reproduce?
- How does kidney function?
- What is the specific genetic code of the fruit fly?
- How does the human memory work?
- How do children acquire new languages?
- How do panic attacks happen?
- What are the symptoms of anxiety disorders?

Applied Research

- How to improve yield of a crop?
- How to Prepare vaccine for prevention of a disease ?
- How to improve the energy efficiency of homes, offices, or modes of transportation?
- How to improve self study habits of children?
- How to build students' interests in religious studies.
- How to improve classroom interaction between teachers and students.
- What are the treatment options for anxiety disorders/panic attacks?
- What are the ways to improve employees' productivity in the workplace?

Uses of BR &AR

BR

- basic research is useful for gathering novel information about a concept, phenomenon or field of study.
- Basic research explores the functions and features of newly discovered phenomena in order to improve the understanding of these concepts hence; it fuels scientific and technological innovations

AR

- Applied research is useful for finding practical solutions to defined problems
- Applied research, on the other hand, helps to provide solutions to improve a specific condition or create new technology.
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Purpose & Context

BR

- Basic research is driven by curiosity and the need to explore new areas of knowledge in different fields.
- Basic research is conducted in a controlled research environment such as a laboratory

AR

- applied research is driven by the need to provide answers to specific questions in order to solve
- conceptual research is conducted in a real-life setting
- In applied research, however, the researcher allows the dependent and independent to freely interact with one another in an unrestricted setting where other variables or third factors may intervene. This allows the researcher to have a broader overview of the research problem and arrive at valid and practical solutions.

scope

BR

- basic research that can be applied to diverse concepts
- it deals with diverse concepts across different subject matters, basic research is considered a more universal research method than conceptual research. Fundamental research explores knowledge across multiple dimensions in order to gather new information and improve an existing body of knowledge.

AR

- Generally, applied research is more limited in scope when compared to basic research.
- applied research largely focuses on a specific subject, and its research outcomes are primarily relevant to this subject.

Theory formulation

BR

- **basic research aims at formulating theories and generalizations that explain a concept, subject or phenomenon and are universally applicable.**

AR

- **applied research or conceptual research studies empirical evidence in order to align its findings with a specific problem.**

Data collection

Basic research & Applied Research

basic and applied research adopt similar data collection processes in order to gather relevant data and arrive at the most objective research outcomes. They typically make use of qualitative and quantitative methods such as interviews, questionnaires, surveys, and focus groups to gather information and arrive at research outcomes.

Intersectionality & reasoning

Basic research & Applied Research

- The research outcomes of basic research often serve as the bedrock for applied research.
- Basic and applied research methods make use of both inductive and deductive reasoning to support the research hypotheses. In deductive reasoning, the researcher moves from the idea to observation, while in inductive reasoning, the researcher transits from observation to the idea.