



## Analysis on the Nature, Functions, and Process of Research: Revealing the Characteristics of Scientific Research, Types of Research, and Classification in Research

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### Abstrak

Artikel penelitian ini menggali inti, fungsi, dan proses penelitian dengan fokus pada penelitian ilmiah. Selain itu, artikel ini memeriksa karakteristik penelitian ilmiah, mengidentifikasi berbagai jenis penelitian, dan meninjau klasifikasi dalam domain penelitian. Tujuan dari studi ini adalah memberikan pemahaman komprehensif tentang penelitian dan pentingnya dalam bidang sains dan teknologi. Dengan menangani aspek-aspek ini, penelitian ini bertujuan untuk meningkatkan pemahaman pembaca dan mendorong pelaksanaan yang tepat dari metodologi penelitian. Secara keseluruhan, analisis ini berkontribusi pada kemajuan sains dan teknologi melalui penelitian yang kredibel dan berdampak.

**Kata Kunci:** Penelitian Ilmiah, Metodologi Penelitian, Jenis-jenis Penelitian

### Abstract (English-Indonesia)

*This research article explores the essence, functions, and process of research, with a specific focus on scientific research. In addition, it delves into the characteristics of scientific research, identifies different types of research, and examines classifications within the research field. The aim of this study is to provide a comprehensive understanding of research and its significance in the realm of science and technology. By addressing these aspects, the research aims to deepen readers' knowledge and promote the correct execution of research methodologies. Ultimately, this analysis contributes to the advancement of science and technology by fostering credible and impactful research.*

**Keywords:** Scientific Research, Research Methodologies, Types of Research

### Introduction

Research serves as the fundamental basis in the realm of science and technology. It involves

seeking solutions to unanswered questions and uncovering new knowledge that benefits humanity (Fahmi et al., 2022). According to (Cohen et al.,

2000), research entails explaining and interpreting scientific findings while integrating them into a conceptual framework. Through research, we generate fresh insights and develop practical solutions for diverse human challenges (Waruwu, 2023). Research is a systematic exploration of real-world facts, encompassing the essence, function, and process inherent in science. It is crucial to understand the distinguishing characteristics of scientific research to ensure the validity and reliability of research outcomes. Researchers have defined various types of research and classifications to elucidate the differences between research methodologies (Rahmadi, 2011). This article aims to uncover the essence, function, and process of research, investigate the characteristics of scientific research, identify research types, and delve into research classifications, thereby fostering a deeper comprehension of research within the realm of science and technology.

In the rapidly evolving landscape of information and knowledge, research plays a pivotal role in generating novel ideas, advancing theories, and making discoveries that are advantageous to human existence. Moreover, research is a vital tool for evidence-based decision-making. However, to gain a profound understanding of the essence, function, and process of research, along with the characteristics of scientific research, research types, and research classifications, a robust grasp of research methodology is essential.

Through a comprehensive exploration of research's essence, function, and process, coupled with an examination of the characteristics of scientific research, research types, and research classifications, we enhance our understanding of the research domain. This deeper comprehension enables us to formulate relevant research questions, develop appropriate methodologies, and execute accurate data analysis. Ultimately, this endeavor facilitates the production of credible research with scientific value, contributing substantially to the advancement of science and technology. Therefore, conducting a thorough analysis of research's essence, function, and process, as well as unraveling the characteristics of scientific research, research types, and research classifications, is indispensable for a comprehensive understanding of this realm of research.

This research aims to address several problem statements. Firstly, it explores the essence of research as an integral component in science and

technology. Secondly, it delves into the primary functions of research and its pivotal role in generating new discoveries and fostering theory development. Thirdly, it identifies the processes involved in conducting research and the requisite steps to maintain research quality. Fourthly, it investigates the distinguishing characteristics of scientific research compared to other research types. Lastly, it delineates the existing research types and elucidates the principles underpinning research classifications. By addressing these inquiries, the author endeavors to provide a deeper understanding of research's essence, function, and process, in addition to unveiling the distinguishing characteristics of scientific research, research types, and research classifications.

This research has various objectives. Firstly, it aims to provide a clear and comprehensive understanding of research's essence, function, and process. Furthermore, it seeks to expound upon the distinguishing characteristics of scientific research compared to other research types. Additionally, it endeavors to identify and classify the existing research types based on relevant characteristics. Accomplishing these research objectives is expected to empower readers with a holistic comprehension of research, foster an appreciation for research's significance in scientific development, and enable the correct execution of research according to appropriate methodologies. Research yields substantial benefits. Overall, research enhances readers' understanding of research, facilitates the application of appropriate methodologies, and promotes the production of high-quality scientific work (Rahmadi, 2011). The discussion of research's essence, function, and process provides several advantages. Firstly, research expands our knowledge and comprehension of specific subjects or topics, leading to the development of new theories, findings, and ideas that contribute to the advancement of knowledge. Secondly, research aids problem-solving and decision-making processes by gathering evidence and data for informed decision-making across various domains. Thirdly, research nurtures critical thinking and intellectual growth through the analysis of information, source evaluation, and logical connections. Fourthly, research fosters innovation and creativity, uncovering innovative ideas and solutions that drive progress across diverse industries. Lastly, research promotes collaboration and knowledge-sharing, as researchers collaborate, exchange ideas, and

disseminate findings through conferences, journals, and other platforms, enriching the collective knowledge of the scientific community. In conclusion, research plays a pivotal role in advancing society and propelling progress in varied fields of study.

## Methods

The research method is primarily qualitative in nature. The researchers conducted a systematic literature review and analysis to explore the essence, functions, and process of research. The researchers focused specifically on scientific research and aimed to reveal the characteristics of scientific research, identify different types of research, and examine classifications within the research field. To gather relevant data, the researchers reviewed existing studies, scholarly articles, and other literature sources that discussed research methodology, scientific research, and different types of research. They carefully analyzed and synthesized the information to draw conclusions and make observations about the nature, functions, and process of research. The researchers employed a comprehensive and systematic approach to evaluate various aspects of research, including its significance in the realm of science and technology. This involved identifying key themes, synthesizing information, and making connections between different research methodologies and practices. The analysis conducted in this research aimed to provide a deeper understanding of research and promote the correct execution of research methodologies. Ultimately, the findings of this study contribute to the advancement of science and technology by fostering credible and impactful research.

## Result and Discussion

### The Core of Research

The fundamental aspect of research is the truth that underlies the research activity itself. By comprehending the true nature of research, researchers can acknowledge the value and significance of research in expanding and advancing knowledge. Research that is conducted with a genuine understanding of its essence has the ability to make meaningful contributions to knowledge and human life on a broader scale.

Research is a systematic endeavor to acquire understanding, broaden knowledge, or find answers to unanswered questions. It is a methodical and

structured undertaking to investigate the natural and social aspects in order to test and enhance existing knowledge, as well as generate new knowledge (Naidoo, 2011). Clifford Woody explains that research involves processes such as defining and redefining problem statements, formulating hypotheses or proposed solutions, collecting, organizing, and analyzing data, making deductions and reaching conclusions, and ultimately carefully testing those conclusions to evaluate their alignment with the formulated hypotheses (Kothari, 2004). (Song, 2021) suggests that research, particularly academic or scientific research, involves connecting the past achievements with the current and/or future necessities to generate new knowledge. Additionally, research necessitates objectivity in order to provide substantial contributions to the chosen field or relevant community.

Research encompasses a commitment to scientific truth, the usefulness of research to society, and the utilization of appropriate scientific methods to collect, analyze, and interpret data (Eller et al., 2019). Furthermore, research should be conducted systematically. This does not only concern data collection and processing, but also the approach employed to analyze previous work in the same field (Kay, 2022). In the process of research, there are several stages to be followed, including formulating research questions, designing methodologies, gathering data, analyzing results, and drawing conclusions.

Research requires an understanding of relevant theories and literature in the field of study. Additionally, research combines careful empirical observation with diligence and accuracy in the data collection process.

The essence of research also necessitates honesty and ethical reporting of research findings. The validity and findings of research must be ensured through the use of appropriate methods, hypothesis testing, and research replication. Furthermore, research must respect the rights of research subjects and consider the potential impacts that may arise from the research.

### The Function of Research

According to Giphart (1986) in (Sugiyono, 2021), generally there are three functions of research, namely:

1. Understanding phenomena: This function is known as "need to know" which helps in

understanding the phenomena or events that occur around us.

2. Aiding in job execution: This function is called "need to do" which helps in the execution of work or actions required to achieve a goal.
3. Choosing and measuring: This function is known as "need to choose" which helps in the process of choosing and measuring towards a desired outcome.

### Characteristics and Features of Scientific Research

Azwar's (in Soesilo, 2018) research identifies several characteristics of scientific research. These include the need for clear objectives, systematic and controlled procedures, objectivity, consistency between data and analysis, and testability. In summary, research should be systematic, objective, and considered true science.

Having clear objectives means that research activities should have specific goals aimed at solving a problem. It is important for researchers to formulate clear objectives aligned with the problem they want to address.

Systematic and controlled procedures are essential in research. Research should be well-planned and follow appropriate rules and principles specific to the type of study being conducted. The quality of research is greatly influenced by the accurate and appropriate methodological steps taken.

Research should be free from personal interests and subjectivity. Researchers should not let their personal preferences or the interests of others bias their observations, analyses, and conclusions. They should gather and examine relevant facts, even if they contradict each other, in order to base their analysis and conclusions on factual findings.

Research should also be testable. Conclusions drawn from research should be based on solid theories and appropriate methods, allowing others to replicate the research and arrive at similar conclusions.

(Naidoo, 2011) highlights five characteristics of research: relevance, research design, research orthodoxy, theoretical orientation, and ethical framework. Research should consider content and contextual relevance to avoid becoming directionless and violating ethical principles. The research process requires the use of time, resources, and careful thinking, so wasting resources or subjecting participants to unreliable processes is deemed unethical.

Research orthodoxy refers to the adherence to established rules, norms, and principles in the scientific community. Using accepted methodologies and protocols ensures that research findings can be trusted by the scientific community, presenting meaningful contributions to knowledge.

Theoretical orientation provides researchers with a framework for understanding and applies relevant theoretical perspectives to guide their research.

Ethical considerations are crucial when conducting research. Participants should experience positive benefits, avoid harm or loss, and retain their autonomy. Providing clear information about objectives, procedures, and participant rights and protections is essential.

### Research Process

Research is a systematic process that consists of stages that must be followed. These stages should be a flexible process. According to (Suwartono, 2014), every research begins with a problem and ends with a conclusion. (Suwartono, 2014) divides the research process into three stages: the preparation and planning stage, the research implementation stage, and the report writing stage.

In the preparation stage, the researcher starts by identifying the problem to be studied, reviewing relevant literature, formulating the problem, and determining the research methodology. In the second stage, the research implementation stage, the researcher begins to explore the field to collect data, validate data, and analyze data. Finally, in the last stage of the research, after the researcher draws conclusions from the research findings, the researcher prepares a research report as part of the publication and dissemination process to make the research known to the audience.

Almost the same as (Suwartono, 2014), Sukmadinata argues that the research process is an interactive activity between researchers, logic, problems, design, and interpretation (2013). According to (Sukmadinata, 2013), the research process includes:

1. Identifying the problem

The activity of problem identification starts with identifying essential, current, crucial issues, and the most popular issues to discuss. (Ridha, 2017) emphasizes that this stage is the most crucial because research is built based on the problem, and this stage serves as a guide for researchers in conducting research.

## 2. Formulating and limiting the problem

In this stage, researchers try to present factors or variables that become the focus of the issue. These factors or variables need to be limited so that the research problem is not too broad and is confined to dominant factors or variables.

## 3. Conducting a literature review

A literature review is an activity to examine existing literature or readings as a basis for the researcher to study related to the field of study and the methodology to be used in the research. This literature review is empirical and sourced from previous research results or serves as the basis of the researcher's thinking according to the scientific framework (Ridha, 2017).

## 4. Formulating research hypotheses

Research hypotheses are predictions made by researchers about the relationship between variables (J. W. Creswell, 2014). (Sukmadinata, 2013) refers to research hypotheses as research questions formulated by the researcher. These hypotheses can take the form of a quantitative approach using statistical data, but not for the quantitative approach using descriptive statistical data.

## 5. Determining the research design and methodology.

Research design is a tool for researchers to determine research approach, research methodology, data collection, data sources, and the reason why the researcher uses a certain method. (Ridha, 2017) emphasizes that this part is crucial as it determines the research design, which affects the success and validity of the research.

## 6. Developing instruments and collecting data

Before data collection, the research instruments need to be prepared and tested. In data collection, objectivity, accuracy, legality, and ethics must be considered in the implementation process. Data can be collected using interviews, observations, questionnaires, checklists, etc.

## 7. Analyzing data and presenting results

Quantitative research tests the hypothesis first and then tests the reliability and validity of the data (Idrus, 2009). After data collection, the data is analyzed according to the research design. Quantitative data is analyzed using descriptive statistical techniques such as tables, graphs, profiles, charts, or using inferential statistics such as correlation, regression, etc. Qualitative data is analyzed using qualitative descriptive

narrative-logical analysis techniques. Researchers can use computers to analyze data. Quantitative data can be analyzed using SPSS software, while qualitative data can be analyzed using NVivo or Lisrel software.

## 8. Interpreting findings, drawing conclusions, and making recommendations.

The results obtained from data analysis do not have meaning on their own. Therefore, there needs to be an interpretation of the findings by connecting the meaning of the relationship between one finding and another.

Based on data processing and interpretation of findings, the next step is to draw conclusions that are adjusted to the initial hypothesis. The conclusion is a generalization of the interpreted data. Drawing conclusions in quantitative and qualitative research differs. Although qualitative research is not generalization, the essence of generalization still exists, such as finding crucial things from a description.

From the results of drawing conclusions, recommendations and suggestions are arranged. The implication is the result of logical findings in the conclusion. Recommendations are what stakeholders should do to utilize the research findings. (Idrus, 2009) refers to the process of drawing conclusions, implications, and recommendations as a reflex aimed at finding new solutions that are adjusted to future needs.

## Research Classification

There is a variation in the classification of research methods among different experts, which can be observed from their individual perspectives (Idrus, 2009). However, this variation does not alter the fundamental essence of research itself. Research can be categorized into different types based on the approach used, the purpose of the research, the research objectives, the research field, the research location, and the level of exploration.

### 1. Research Based on Approach

(J. W. Creswell, 2014) classifies research into three main approaches: quantitative, qualitative, and mixed methods. Each approach has its own distinct characteristics. Quantitative research, as explained by (Sukmadinata, 2013), is based on the concept of positivism and assumes a singular, fixed, and stable reality that is independent of individual beliefs and feelings. Reality is considered separate and can be

measured using instruments. On the other hand, qualitative research is grounded in constructivism, where reality is seen as plural, holistic, and interconnected. Reality is context-dependent and includes individual perspectives, and human beings are considered instruments for investigating it.

The goals of quantitative and qualitative research differ in terms of language and the focus on connecting variables (J. W. Creswell, 2014). Quantitative research aims to establish relationships between variables that can be measured and explain causal changes. In contrast, qualitative research focuses on understanding the phenomena experienced by participants and the contextual aspects of the research (J. Creswell, 2014; Sukmadinata, 2013)

In terms of the research process, quantitative research follows a standardized set of steps and requires the researcher to maintain objectivity. Meanwhile, qualitative research adopts an open design, offers more flexibility, and involves the researcher integrating with the subject matter being studied (Sukmadinata, 2013).

Mixed methods research is an approach that combines both quantitative and qualitative research in a sequential manner, guided by a pragmatic view (J. W. Creswell, 2014). In mixed methods research, the reasons for using a combination of approaches are explained in the introduction, incorporating elements of both quantitative and qualitative research. According to (Sugiyono, 2021), in mixed methods research, researchers position themselves independently and interactively throughout the research process.

## 2. Research Based on Function

(Sukmadinata, 2013) categorizes research into three main types based on function: basic research (or pure research), applied research, and evaluation research. The primary function of basic research is to discover new knowledge that was previously unknown (Sumantri, 1985 in Darmadi, 2014). It aims to test theories that can predict and explain natural and social phenomena, influencing people's thoughts and perceptions (Sukmadinata, 2013).

Applied research, on the other hand, aims to build upon existing knowledge, conducts research to seek solutions for common problems in specific fields, and improves practical applications (Sukmadinata, 2013). It leads to precise and practical knowledge within a specific field and contributes to the development of research methodologies.

Evaluation research focuses on assessing the implementation of activities and programs in various settings and institutions. Its goal is to measure the benefits, contributions, and feasibility of specific programs or activities (Sukmadinata, 2013).

## Conclusion

The analysis of the nature, functions, and process of research provides valuable insights into the characteristics of scientific research, the various types of research, and the classification within the research field. Scientific research is categorized into quantitative, qualitative, and mixed methods approaches, each with its own distinct characteristics and goals. The research process differs between these approaches, with quantitative research following a standardized set of steps and qualitative research adopting a more flexible and integrated approach. Additionally, research can be classified based on its function, with basic research aiming to discover new knowledge, applied research seeking solutions to specific problems, and evaluation research focusing on assessing the implementation of programs and activities. Understanding these aspects of research is crucial for researchers and scholars in determining the most appropriate approach and function for their studies.

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