



Basic Concepts of Research Methodology

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Abstract

Research methodology is a fundamental element in scientific activities, serving as a systematic framework for obtaining valid, objective, and scientifically accountable knowledge. The basic concepts of research methodology encompass an understanding of the nature of research, the philosophical foundations of science, scientific approaches, and the methods and techniques used in the research process. In practice, research methodology plays a crucial role in determining the direction of research, from problem formulation and objective determination to the selection of research approaches (qualitative, quantitative, or mixed), to data collection and analysis techniques. Mistakes in methodology selection can impact the validity and reliability of research results. Therefore, a comprehensive understanding of the basic concepts of research methodology is a primary need for researchers, particularly in the fields of education and social sciences. This article aims to examine the basic concepts of research methodology as theoretical and practical guidelines for compiling and conducting scientific research. The discussion focuses on methodological principles, types of research, and systematic research stages. By understanding the basic concepts of research methodology, researchers are expected to be able to produce high-quality scientific work that makes academic contributions and is relevant to the needs of scientific development and problem-solving in society.

Keywords: Research Methodology, Scientific Research, Research Methods.

INTRODUCTION

Research methodology is a set of scientific principles, concepts, and procedures used to design, implement, and analyze research in a systematic, directed, and accountable manner. Research methodology encompasses all stages of research, from the formulation of the problem and research questions, through the determination of approaches and methods, data collection techniques, to the analysis and interpretation of research results. A strong methodology is a key requirement for producing valid, reliable, and scientifically credible findings. Without a clear and precise methodological foundation, research results are prone to bias, misinterpretation, and loss of scientific value, which should be the primary characteristics of academic research (Tumurang, 2024).

The basic concepts of research methodology relate not only to the technical aspects of research implementation but also encompass an understanding of the nature of research, the philosophical foundations of science, research paradigms, and the approaches and methods used. Understanding these philosophical and conceptual aspects is crucial because research methodology is essentially a reflection of the researcher's perspective on reality, knowledge, and scientific truth. Misunderstanding the basic concepts of research methodology can lead to errors in determining research design, selecting inappropriate instruments, and drawing invalid and scientifically difficult to justify

conclusions. Therefore, research methodology must be understood as the primary foundation supporting the entire research process, not merely a formal or administrative procedure (Suroyya, Mahmudah, & Fatimah, 2022).

In the context of higher education and scientific development, research methodology is generally taught as a foundational course for students and novice researchers. This course is expected to equip students with scientific, critical, and systematic thinking skills in conducting research. However, in practice, many studies still demonstrate a weak understanding of the basic concepts of research methodology. Many studies are conducted mechanically, simply following a specific format or template, without a deep understanding of the philosophical and methodological reasons behind the choice of research approaches and methods. As a result, the resulting research tends to be descriptive-normative, lacking critical thinking, and making minimal contributions to the development of science.

Advances in science and technology also influence the dynamics of research methodology. The emergence of various new approaches, such as mixed methods, digital-based research, big data analysis, and the use of quantitative and qualitative data analysis software, requires researchers to have an increasingly comprehensive methodological understanding. Researchers are not only required to be able to use research techniques and tools practically, but also to understand the theoretical, epistemological, and ontological foundations

underlying these methods. Without a strong understanding of basic concepts, methodological innovations have the potential to be misused and produce biased, superficial, or inappropriate findings for the research objectives (Mujtahidin & Oktariato, 2022).

Several previous studies have discussed research methodology from various perspectives, such as the classification of research types, data collection techniques, and data analysis methods. Some studies also emphasize the importance of validity, reliability, and objectivity in scientific research. However, most of these studies still focus on the technical and procedural aspects of research methodology. Discussion of the basic concept of research methodology as a unified whole—integrating philosophical, conceptual, and practical aspects—is still relatively limited, particularly in the context of education and the social sciences.

This situation indicates a research gap in the study of research methodology. There remains a lack of comprehensive studies addressing the basic concepts of research methodology as the primary foundation for designing and conducting scientific research. Many textbooks and research studies directly discuss research methods and techniques without beginning with a thorough understanding of the nature of research and the philosophical foundations of science. Yet, understanding these basic concepts is crucial for the quality, direction, and relevance of research.

Based on these conditions, this study

focuses on the basic concepts of research methodology as an effort to strengthen researchers' theoretical and practical understanding in conducting scientific research. This study is expected to provide an academic contribution in the form of a systematic, comprehensive, and easy-to-understand mapping of basic concepts of research methodology. Therefore, the results of this study can be used as a reference for students, novice researchers, and academics in understanding and applying research methodology appropriately. A strong and comprehensive understanding of research methodology is expected to produce research that not only meets formal academic requirements but also has scientific validity, critical thinking, and high relevance in addressing scientific problems and societal needs (Nisa, 2025).

METHOD

This research uses a qualitative approach with a library research method. A qualitative approach was chosen because this research aims to understand, interpret, and analyze in depth the basic concepts of research methodology as a theoretical and conceptual construct. A library study is considered appropriate because the object of study is not an empirical phenomenon in the field, but rather ideas, concepts, and thoughts contained in various written sources. Through this approach, researchers can systematically explore the views of experts, theories, and developments in thinking related to research methodology over time.

Research data was obtained from various relevant scientific literature sources, including research methodology textbooks, reputable national and international journal articles, scientific proceedings, and other academic documents directly related to the research topic. Data source selection was conducted purposively, taking into account several key criteria: the credibility and authority of the authors, the suitability of the substance to the focus of the study, and the level of recency of the publications. With these criteria, it is hoped that the data used will not only be theoretically relevant but also possess accountable academic validity and reliability.

Data collection techniques were conducted through a systematic literature search using various sources, both print and digital. Searches were conducted through libraries, scientific journal databases, and trusted academic repositories. The data obtained was then recorded, classified, and organized according to the research focus, thus facilitating the analysis process. This stage aims to ensure that all data used is neatly organized and relevant to the research problem formulation.

Data analysis was conducted using descriptive-qualitative analysis techniques. This analysis was conducted by reviewing, comparing, and synthesizing various expert views on the basic concepts of research methodology. The analysis process was carried out in stages and systematically, starting with data reduction, data presentation, and drawing conclusions. Through this analysis, researchers

attempted to identify patterns, similarities, and differences in the ideas developed in the literature, thus gaining a comprehensive, complete, and in-depth understanding of the basic concepts of research methodology as the primary foundation for conducting scientific research.

RESULTS AND DISCUSSION

Understanding Research Methodology

Research methodology is a fundamental element in the development of science, serving as the primary foundation for designing and implementing scientific research processes. The existence of a research methodology ensures that the knowledge-seeking process is conducted in a focused, systematic manner, and in accordance with applicable scientific principles. Without a clear methodology, research risks losing direction, purpose, and a reliable scientific basis.

In the context of scientific research, research methodology encompasses the entire process used to obtain valid and reliable knowledge through systematic, logical, empirical, and replicable procedures. This methodological approach makes research not merely an ordinary intellectual activity, but rather a structured scientific endeavor to find answers to specific problems based on academically recognized scientific principles.

Scientific research based on a strong methodology enables researchers to produce findings that are not merely subjective but can also be tested, verified, and developed by other researchers. Thus, research methodology plays a

crucial role in maintaining the objectivity and consistency of research results, while strengthening research's position as part of the ongoing development of science.

According to Zulfikah, Sulaiman, and Rahman in their article "Research Methodology: A Conceptual Analysis to Understand the Nature, Objectives, Procedures, and Classification of Research," research methodology has the following main characteristics: systematic, logical, empirical, and replicable (Nur, Sulaiman, & Rahman, 2024). These four characteristics are important indicators in assessing the quality of scientific research.

Systematic characteristics indicate that each stage of research must be structured in a planned and sequential manner, from problem formulation to conclusion drawing. This systematic approach helps researchers maintain a consistent flow of thought and avoid procedural errors that could impact research results.

Logical research methodology refers to the use of rational reasoning and adherence to scientific principles. Researchers are required to formulate arguments, hypotheses, and interpret data based on academically acceptable logic. Thus, research results are not speculative but rather supported by sound reasoning and can be scientifically tested.

The empirical aspect emphasizes that research must be based on real data obtained through experience, observation, or measurement. Empirical data serves as the

primary evidence for supporting or refuting research findings. Meanwhile, the replicable nature indicates that research conducted can be repeated by other researchers using the same procedures and produce relatively consistent findings, thus enhancing the research's scientific credibility.

In general, research methodology is not only concerned with data collection techniques, but also encompasses the philosophical and strategic dimensions that underlie the selection of methods and analytical techniques. Understanding these aspects helps researchers determine a research approach that aligns with the characteristics of the problem and the desired research objectives.

In this regard, research paradigms such as positivism, interpretivism, and constructivism play a crucial role in shaping researchers' perspectives on reality and knowledge. These paradigms influence the type of data collected, the method of data collection, and the analytical techniques used to generate research findings (Salim, Ahida, & Yaldi, 2024).

More broadly, research methodology aims to guide researchers in selecting the most appropriate method to address the research problem. Selecting an appropriate methodology directly impacts the validity, reliability, and credibility of the research results. Mistakes in selecting a methodology can lead to research bias and reduce the quality of the findings (Maulida et al., 2024).

Furthermore, research methodology also encompasses the step-by-step procedures researchers must follow, from identifying and

formulating the problem, compiling a literature review, determining the design and data collection techniques, analyzing the data, and developing conclusions and a research report. Each of these stages is interrelated and requires careful planning to ensure effective and efficient research.

The interconnectedness of the stages in research methodology demonstrates that research is a holistic and continuous process. Weaknesses in any one stage can impact the overall quality of the research. Therefore, researchers are required to understand research methodology holistically, not just specific technical aspects.

Thus, research methodology cannot be understood simply as a collection of techniques and operational procedures, but rather as a comprehensive approach encompassing philosophical, conceptual, and practical aspects in the pursuit of scientific truth. A thorough understanding of research methodology will enable researchers to produce superior, relevant, and accountable scientific work both within the academic community and in the context of solving practical problems in society (Indra Efendi, 2022).

Research Methodology Objectives

Research methodology aims to provide a systematic scientific framework so that the entire research process can be conducted in a directed, logical, and structured manner. This framework serves as a guide for researchers in designing research from the initial stages, starting from identifying and formulating the

problem, determining research objectives, selecting a research approach, and determining methods and techniques appropriate to the characteristics of the research object and context. With a clear research methodology, the research process is not conducted randomly or speculatively, but rather follows scientific principles that can be academically justified (Anelda Ultavia B., Putri Jannati, Fildza Malahati, & Qathrunnada, 2023).

Besides serving as a framework, research methodology also aims to ensure the validity and reliability of research results. By selecting appropriate methods, using appropriate instruments, and applying systematic data collection and analysis techniques, methodology helps ensure that the data obtained accurately reflects the phenomenon being studied. Validity relates to the accuracy of data in measuring the research object, while reliability relates to the consistency of research results when retested. Research that is not supported by an appropriate methodology has the potential to produce biased findings, be scientifically flawed, and difficult to verify by other researchers (Syafii et al., 2025).

Another goal of research methodology is to develop and enrich the body of scientific knowledge. With systematic and retestable research methods, research results are not only beneficial to the researcher in question but can also serve as a reference for other researchers in developing theories, broadening scientific perspectives, or conducting further research. In this context, research methodology plays a crucial role in building a sustainable and

continuous accumulation of scientific knowledge (Juniarti et al., 2025).

Furthermore, research methodology aims to facilitate scientific problem-solving. It provides guidance to researchers in selecting the most effective approaches and methods to understand, explain, and offer solutions to various problems occurring in society. These problems can encompass various fields, such as education, social issues, economics, law, and religion. Thus, research methodology serves as a bridge connecting scientific theory with real-life practices (Susilawati et al., 2025).

Ultimately, research methodology aims to foster a scientific attitude and research ethics in researchers. Through understanding and applying appropriate methodology, researchers are trained to be objective, honest, critical, open to criticism, and responsible at every stage of the research. This scientific attitude and research ethics are essential foundations for producing scientific work that is not only academically valid but also meaningful, useful, and makes a real contribution to the development of science and the welfare of the wider community.

Scope of Problems and Research Methodology

The scope of a research problem is the study's boundaries established by the researcher to focus the discussion so that the research can proceed in a directed, systematic, and in-depth manner. Determining this scope is a crucial step in the research planning stage because it serves to clarify the focus of the study and limit the problem so it does not become too broad and

deviate from the formulated research objectives. With a clear scope, researchers can focus on relevant and significant aspects according to the research context (Moleong, 2021).

Determining the scope of the problem also aims to adapt the research to the researcher's limitations, including time, resources, costs, and academic capabilities. Research that is too broad in scope can be difficult to complete optimally, while a scope that is too narrow can reduce the depth and meaning of the research. Therefore, the scope of the problem must be defined proportionally so that the research can be carried out effectively and efficiently without compromising the expected scientific quality.

In the context of research methodology, the scope of the problem includes determining the research object, research subjects, location, time, and variables or focus of the study to be studied. Determining these elements helps researchers formulate specific and measurable research questions. Thus, the scope of the problem serves as a starting point for determining the research direction and the most appropriate method to address the problem under study (Fadillah et al., 2025).

A clear problem scope also plays a crucial role in making it easier for readers or others to understand the research's limitations. Readers can clearly see which aspects are discussed and which are not the focus of the research. This clarity is crucial for avoiding misunderstandings in interpreting research results and for increasing the transparency and accountability of the resulting scientific work.

Furthermore, the research problem's scope serves as the primary guideline for data collection and analysis. The collected data focuses solely on the aspects defined within the research scope, allowing for in-depth and relevant analysis. This helps maintain consistency between the problem formulation, research objectives, methods, and results (Arikunto, 2019).

Consistency between the research problem scope and other research stages is crucial for maintaining research quality. Mismatches between the scope and the data collected can lead to unfocused and difficult to scientifically validate research results. Therefore, the research problem scope must serve as the primary reference point in every research stage, from planning to reporting.

Thus, the scope of a research problem plays a strategic role in maintaining the focus, quality, and direction of the research. Determining the correct scope not only helps researchers work systematically but also increases the validity, depth of analysis, and relevance of the research results. Therefore, determining the scope of the problem is a crucial initial step in the entire scientific research process (Rolando et al., 2025).

The scope of a research method refers to the boundaries and scope of the scientific approach used by researchers to examine a research problem. Research methods encompass all systematic procedures designed to obtain valid and reliable data, from selecting a research approach and data collection techniques to

analyzing and drawing conclusions. Determining the scope of a research method is crucial to ensuring the research process is directed, consistent, and aligned with the stated research objectives (Sa'adah, 2024).

Within the scope of research methods, researchers determine the approach used, such as qualitative, quantitative, or mixed methods. The choice of this approach directly influences how researchers understand the phenomenon being studied, formulate the focus or research variables, and interpret the data obtained. Thus, the scope of research methods both limits and directs the scientific perspective and strategies used in examining the research object (Wahyuningsih, Sepriyanti, & Kustati, 2026).

The scope of research methods also includes determining data collection techniques, such as observation, interviews, questionnaires, documentation, or tests. Furthermore, the data sources used, both primary and secondary, as well as the research subjects, respondents, or informants, are determined. These limitations aim to ensure that the collected data is relevant to the research focus and has a level of validity that can be scientifically justified (Mandala, 2025).

Furthermore, the scope of research methods includes data analysis techniques and conclusion-drawing procedures. Researchers determine an analysis method appropriate to the type of data and research approach used, such as statistical analysis in quantitative research or thematic and interactive analysis in qualitative research. Determining the appropriate analysis technique will help researchers interpret data objectively

and systematically.

With a clear scope of research methods, the research process can be carried out in a more controlled and directed manner. Limiting the methods used helps researchers maintain consistency between approaches, data collection techniques, and data analysis. Ultimately, an appropriate scope of research methods is expected to produce valid, objective, and highly reliable research findings, thus making a significant contribution to the development of science (Murdiono, 2023).

CONCLUSION

Research methodology is the primary foundation for conducting scientific research because it serves as a systematic framework that guides the entire research process toward obtaining valid, objective, and academically accountable knowledge. The existence of a research methodology ensures that every stage of the research, from problem formulation to conclusion drawing, is conducted based on logical, systematic, and measurable scientific principles. Without a strong methodological foundation, research can potentially lose direction, suffer from bias, and produce scientifically flawed findings.

Understanding the basic concepts of research methodology is a crucial prerequisite for producing quality research. These basic concepts encompass the nature of research, the philosophical foundations of science, research paradigms and approaches, and the research methods and techniques used. Each of these

elements is interrelated and forms a unified whole that influences how researchers design research, collect data, and analyze and interpret research findings accurately and meaningfully.

Research methodology cannot be understood solely as a set of technical or procedural steps, but rather as a scientific framework with philosophical and conceptual dimensions. The philosophical dimension of research methodology influences how researchers view reality, determine their position on knowledge, and select approaches appropriate to the characteristics of the research object. Meanwhile, the conceptual dimension plays a role in building a theoretical framework that serves as the basis for formulating research problems and hypotheses.

In the context of conducting research, defining the scope of the problem and the scope of the research method is crucial. The scope of the problem serves to limit the focus of the study so that the research does not become too broad and remains aligned with the research objectives. With clear boundaries, researchers can focus on the most relevant and significant aspects for in-depth study.

Likewise, the scope of the research method plays a crucial role in maintaining consistency between the research objectives, the approach used, the data collection techniques, and the data analysis methods. Determining the appropriate scope of the method helps researchers choose the scientific strategy that best suits the characteristics of the problem and

the data being studied, thus ensuring an effective and efficient research process.

Clarity about the research problem and methodology also contributes to increasing the validity and reliability of research results. Data collected and analyzed according to the established scope will produce more accurate, focused, and accountable findings. This also strengthens the research's credibility in the eyes of the academic community.

With a comprehensive understanding of research methodology, researchers are expected to not only be able to meet the formal requirements of scientific writing but also possess the ability to think critically, systematically, and reflectively when addressing research problems. This understanding enables researchers to develop a well-thought-out research design, select appropriate methods, and interpret research results objectively and contextually.

Ultimately, mastering sound research methodology will foster the production of high-quality, useful scientific work that makes a tangible contribution to the development of science. In the context of education and the social sciences, a strong research methodology is a crucial instrument for addressing current societal issues and supporting evidence-based decision-making.

Thus, research methodology serves not only as a technical tool in research, but also as an epistemological foundation that determines the direction, quality, and meaningfulness of

scientific research. Researchers with a deep methodological understanding will be better able to produce research that is not only academically valid but also relevant and beneficial to the development of science and broader social life.

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