

## Methodology of Science and the Epistemological Context: An Integration of Multidisciplinary Perspectives

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| ARTICLE INFO                                   | ABSTRACT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| Volume: 4<br>ISSN: 2963-5489                   | This study discusses the methodology of science in the context of integration and multidisciplinary epistemology. This approach combines various disciplines to understand complex phenomena in a holistic manner. Such integration can broaden perspectives and strengthen the validity of research by combining different viewpoints. The discussion emphasizes the importance of a coherent framework of thinking when integrating related fields of knowledge, so that the resulting research becomes more relevant and applicable in real-world contexts. For example, in health research on diseases, it is important to combine medical data with socio-cultural factors present in remote communities. Multidisciplinary research offers great potential, but it also presents significant challenges, such as communication barriers, differences in scientific cultures, management coordination, and the need for understanding and appreciating other perspectives, among others. A multidisciplinary approach is the process of combining multiple disciplines to collaboratively address specific problems. The main goal is to create a more comprehensive and holistic understanding, especially in the field of education. |
| <b>KEYWORD</b>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Epistemology, Integration, Multidisciplinarity |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### 1. Introduction

The development of scientific knowledge in the modern world no longer occurs in a linear or isolated manner within a single discipline. The complexity of human life in the contemporary era demands a more integrative, comprehensive, and interdisciplinary approach. Issues such as energy crises, climate change, education, socio-political dynamics, and global health cannot be addressed from a single point of view. This is where the importance of a multidisciplinary approach lies—namely, the integration of multiple disciplines to address and understand problems holistically. However, this approach requires a strong methodological and conceptual foundation to ensure that collaboration between disciplines does not become contradictory, superficial, or overlapping. In this context, the philosophy of science plays a crucial role as a conceptual foundation in supporting the development of multidisciplinary scientific approaches. A multidisciplinary approach involves solving a problem by using multiple perspectives drawn from various relevant disciplines. These disciplines may come from the natural sciences, humanities, or social sciences and are used alternately based on relevance. In applying these disciplines, problem-solving through this approach must be clearly outlined and discussed, including in each sub-section, accompanied by a clear contribution toward finding solutions to the issues at hand. The key characteristic of the multidisciplinary approach is "multi"—involving multiple disciplines within the same field of study. Multidisciplinarity is the process of combining several disciplines to collaboratively address specific problems. The primary goal is to create a more comprehensive and holistic

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understanding, particularly in the field of education. In the context of Islamic education, this approach involves integrating various disciplines such as philosophy, Islamic civilization history, Arabic language, and general sciences to gain a deeper understanding of Islamic teachings. The multidisciplinary approach offers a comprehensive perspective by combining knowledge from various fields. One of its major advantages is the ability to provide more comprehensive solutions to educational challenges. By integrating multiple perspectives, education can develop methods that are more adaptive and responsive to actual needs, and solve complex problems that might not be addressed effectively through a single-discipline approach. This also enables a more responsive strategy to the ever-changing dynamics of society and scientific development.

## **2. Literature Review**

Multidisciplinarity is a research approach that involves collaboration among various disciplines to investigate a particular problem or topic. In this type of research, scholars from different academic backgrounds work together, each contributing their own perspectives, methodologies, theories, and data from their respective disciplines to provide a more comprehensive understanding of the issue being studied. The characteristics of multidisciplinary research include: A holistic approach: The problem or topic is examined from multiple perspectives, allowing for a more in-depth and comprehensive understanding. Interdisciplinary collaboration: Researchers from various disciplines work together while maintaining their own disciplinary perspectives and methodologies. Use of diverse methodologies: Various research methods from different disciplines are used simultaneously or in parallel to enrich the analysis. Integration of research findings: The results from different disciplines are combined to provide broader insights or solutions to the issue under investigation. Focus on complex problems: Multidisciplinary research is often used to address complex issues that require understanding from multiple viewpoints, such as public health changes, climate change, information technology, and others. One example of a multidisciplinary approach is in the field of information technology and cybersecurity. This involves collaboration among computer engineers, security experts, psychologists, and legal professionals to develop a comprehensive cybersecurity system. Multidisciplinary research holds great potential for generating innovative discoveries and effective solutions to complex problems. However, its success heavily depends on the researchers' ability to collaborate effectively and integrate various perspectives and methodologies. Collaborative multidisciplinary research brings together different disciplines to solve complex issues. While such collaboration offers significant potential, it also presents notable challenges, including communication barriers, differences in scientific cultures, management coordination, and the need for mutual understanding and appreciation of diverse perspectives. Although these challenges can hinder progress, many of them can be overcome with proper planning, effective communication, and strong institutional support. Success in multidisciplinary research often comes from a team's ability to work synergistically, respect the contributions of each discipline, and remain committed to a shared goal.

## **3. Methodology**

This study employs a qualitative approach. In qualitative research, the presence of the researcher serves both as an instrument and as the data collector. The researcher's presence is essential, as they are directly involved in gathering the data. This aligns with one of the key characteristics of qualitative research, where data collection is conducted directly by the researcher. In this study, the researcher acts as a non-participant observer, meaning the researcher observes the research setting without actively participating in it. The researcher visits the site and communicates their intention to conduct research but does not intervene in the activities being observed. The type of research used in this study is a case study. To ensure the validity and reliability of the data, the researcher paid close attention to the authenticity and dependability of the data throughout the research process. This was done through prolonged engagement, persistent observation, and triangulation, including technical triangulation, source triangulation, and time triangulation.

## **4. Results and Discussion**

Epistemological integration enhances critical and reflective thinking. In the teaching of philosophy and epistemology at the foundational level, it has been shown that such integration can improve students' academic skills, empathy, and ethical understanding. This, in turn, helps shape a generation capable of critical, reflective, and creative thinking. Epistemological integration also addresses the negative impacts of positivism and materialism in education. Positivism tends to sterilize the sciences from metaphysical elements; therefore, integration is needed to gain insight from both scientific perspectives and religious guidance. Several articles highlight the need for a solid conceptual and methodological foundation for the integration of multidisciplinary epistemology. Without such a foundation, collaboration between disciplines can become superficial or overlapping. Discussions of epistemology in philosophy demonstrate that each scholar has different views on how knowledge

is acquired and the criteria for truth. Integration challenges these differences by seeking common ground. The multidisciplinary epistemological integration approach has proven successful in strengthening the validity and broadening the scope of research by combining various disciplines. For instance, the integration of medical data with sociocultural factors in health research leads to more comprehensive and contextually relevant solutions. This integration facilitates cross-disciplinary collaboration, enriching perspectives and methods, and making it possible to address complex problems that cannot be solved by a single discipline alone. While the challenges include communication and coordination among disciplines, the benefits are significant in producing applicable and high-value knowledge. The multidisciplinary approach is a method aimed at generating solutions that consider multiple perspectives from various relevant fields of study. Known as a multidisciplinary approach, it involves the study and investigation of problems by combining different viewpoints and collaborating to solve specific issues. In the context of education, this approach integrates relevant perspectives from other disciplines and encourages collaboration to address particular problems. The multidisciplinary approach emphasizes multi-perspective analysis of the issues being addressed and holds high practical value. The value of the multidisciplinary approach lies in the expectation that experts from diverse academic backgrounds will work together, providing broad opportunities for learners who wish to continue their education. It opens the door to deeper insights and innovative solutions through collaborative knowledge production.

## 5. Conclusion

Multidisciplinary research is an approach that involves collaboration among various disciplines to address complex and broad issues. This approach offers numerous benefits, including a holistic perspective, innovation, enhanced research capacity, and the ability to solve complex problems that require multiple viewpoints. However, such collaboration also presents significant challenges, such as communication difficulties, differences in scientific cultures, as well as coordination and management issues. Success in multidisciplinary research requires careful planning, effective communication, and strong institutional and financial support. Overcoming these challenges enables researchers to produce innovative discoveries and effective solutions that can have a significant impact on complex problems. Successful collaboration creates synergy among various disciplines, maximizing the potential to generate research that is both valuable and applicable.

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