



EDITORIAL

Decoding Research: Philosophical Pillars of Research Paradigms.

A researcher is someone who conducts systematic inquiry and investigation to generate new knowledge, address questions, or solve problems within a specific field of study(1). Like any individual, researchers are shaped by their environment, experiences, and social context(2). These external factors influence researchers' perspectives, motivations, and research interests, ultimately affecting how they conduct research and interpret their findings. While guided by academic training and intellectual curiosity, researchers are also influenced by their personal backgrounds, cultural values, and societal norms. Recognizing the human aspect of researchers underscores the importance of considering their unique backgrounds and experiences, which influence their philosophical beliefs and, in turn, shape their approach to the research process, including their choice of research questions, methodological decisions, and interpretation of outcomes. This interplay between a researcher's background, views, and their scholarly endeavors underscores the subjective nature of the research process, emphasizing the significance of the research paradigm(3).

A research paradigm is essentially a set of guiding principles or a lens through which researchers view and approach their studies(3). It shapes how they understand the world, ask questions, and seek answers. At its core, a research paradigm is built on a few main principles: Axiology, Ontology, Epistemology, and Methodology (FIGURE 1).

Axiology: What Values Guide Research?

Axiology is like the compass that guides researchers on their journey. It's all about the values and beliefs that shape how they conduct their research. Axiology, itself a branch of philosophy concerned with values, plays a significant role in influencing ethical research practices (4). Axiology influences ethical research by guiding researchers in aligning their values with ethical principles, making ethical decisions throughout the

research process, prioritizing participant welfare, upholding research integrity, and considering social responsibility. By integrating axiological considerations into their research practices, researchers can conduct ethically sound research that respects the rights and well-being of participants and contributes positively to knowledge and society.



FIGURE 1 Philosophical pillars of research paradigm.

For instance, a researcher prioritizing social impact might choose to investigate affordable healthcare solutions. Axiology ensures that research practices align with ethical principles, prioritize participant welfare, uphold research integrity, and consider social responsibility.

Ontology: What is Reality?

Ontology is like asking, "What is the nature of reality?" Ontology, itself a branch of philosophy, seeks to understand what things exist in the world and how they relate to each other(5). It delves into questions about the fundamental nature of being, existence, and the categories or types of things that exist. In the context of research paradigms, ontology refers to the beliefs about the nature of reality that guide how researchers approach their studies. So, ontology is about the 'what' and 'how' of existence, providing a framework for understanding the world and everything in it. There may be two stances of research based on ontological

beliefs about the nature of reality. For example, a researcher might take a stance that health behaviors are shaped by external, observable factors. This research searches for objective truths that are measurable, can be explained using statistical analysis and are generalizable to the health behaviors of various groups of people. Another stance might be that these behaviors are constructed through individual perceptions. This research will search for truths based on the subjective understanding of the meanings that people attach to their actions. This stance, instead of focusing on empirical measurement, prioritizes an in-depth understanding of reality over generalizability and objectivity.

Ontology influences research by shaping the research questions, design, interpretation of findings, generalizability of results, and overall research paradigm. Researchers' ontological assumptions fundamentally shape their approach to understanding and investigating the world, ultimately influencing the direction and outcomes of their research endeavors.

For example, in health research, a researcher might explore whether patient recovery is better influenced by medication (viewing recovery as a measurable, objective reality) or by patient perception and experience (viewing recovery as a subjective, constructed reality). These beliefs shape the research questions, design, and interpretation of findings.

Epistemology: How Do We Know What We Know?

Epistemology is like asking, "How do we know what we know?" It's all about understanding how researchers learn about the world(6). Epistemology, itself a branch of philosophy that deals with the nature, scope, and limitations of knowledge, explores questions such as: What is knowledge? How do we acquire knowledge? What are the sources of knowledge? And what are the criteria for determining whether something is true or justified? In the context of research, epistemology influences the way researchers approach the process of acquiring knowledge and understanding the world. Epistemology influences research by shaping researchers' methods of inquiry, their understanding of

knowledge, their interpretation of findings, and their overall research paradigm. Researchers' epistemological beliefs play a fundamental role in determining how they acquire, evaluate, and apply knowledge within their field of study.

For instance, a researcher might use controlled experiments to gather data (believing in an objective method of knowledge acquisition) or might rely on patient narratives and case studies (valuing subjective understanding and personal stories). Therefore, these differing epistemological positions demonstrate the variety of approaches that researchers might take when studying health behaviors.

Methodology: How Do We Study the World?

Methodology is a broad term that encompasses research design, methods, and approaches used in a study. It articulates the logic and flow of the research process that results in gaining new knowledge about a topic of interest(7). It dictates the nature and extent of the assumptions researchers make about their research as well as the strength and limitation of the process of gaining the knowledge. When considering the methodology for a research proposal, researchers should ask themselves: How should we obtain the data? From whom? Why? Does it answer the research question? What is the limitation of the process?

Methodology justifies the use of certain methods or tools such as survey or interview in a study. While methods are the specific tools, techniques, and procedures used to collect and analyze data, methodology is the broader approach that guides the selection of these methods based on the research paradigm. Methodology provides a logical and systematic plan for conducting a research study and ensures that the methods used are appropriate for answering the research questions.

A health research example:

Let's consider a hypothetical research study that is being conducted on dietary interventions for diabetes management.

Axiology (Values): In this study, the researcher's

values focus on patient-centered care and the ethical implications of dietary interventions. The researcher values non-invasive, accessible treatments that can improve quality of life for diabetes patients. These values guide the choice of the research topic itself—focusing on dietary interventions rather than more invasive medical treatments—and ensure that the study is conducted with high ethical standards, prioritizing patient welfare and informed consent.

Ontology (Nature of Reality): The researcher adopts a specific view of reality that acknowledges both the biological and lifestyle aspects of diabetes management. They believe that diabetes is not only a physiological condition but also significantly influenced by individual lifestyle choices and social determinants of health. This ontological stance shapes the research questions, focusing on how dietary changes can affect diabetes management in the context of patients' real lives.

Epistemology (Nature of Knowledge): Given the researcher's belief in the complex, multifaceted nature of diabetes, the epistemological approach is comprehensive. The researcher decides that understanding the effectiveness of dietary interventions requires both quantitative data (e.g., blood sugar levels, weight changes) and qualitative data (e.g., patient experiences and satisfaction with the diet). This mixed-methods approach allows the researcher to gather a broad spectrum of knowledge—from empirical data to personal experiences.

Methodology (Methods of Inquiry): The methodology reflects the mixed-methods approach dictated by the epistemological stance. The researcher uses quantitative methods such as controlled clinical trials to measure the direct effects of the diet on diabetes indicators. Simultaneously, qualitative methods like interviews or focus groups are used to explore patients' attitudes towards the dietary changes, adherence challenges, and lifestyle impacts. This methodology ensures a holistic understanding of the intervention's effectiveness.

Integrating the Concepts

In this diabetes management study, the researcher's values (axiology) emphasize ethical, patient-centered research, influencing the choice of a non-invasive

intervention. The ontological belief in diabetes as influenced by both biological and lifestyle factors shapes the research to consider broader lifestyle interventions. The epistemological stance that both quantitative and qualitative knowledge are necessary guides the selection of a mixed methods approach. This methodology, in turn, informs the specific choice of methods, such as controlled clinical trials (quantitative) and interviews or focus groups (qualitative). This integration shows how each component of the research paradigm — axiology, ontology, epistemology, and methodology — interacts to form a coherent research framework. The researcher's philosophical commitments guide every aspect of the study, from the initial question through to the methods of data collection and analysis, ensuring that the research is not only scientifically valid but also ethically sound and aligned with the researcher's values. This example illustrates how a research paradigm functions as a comprehensive framework that shapes and guides the entire research process, ensuring that all aspects of the study are coherent and aligned with the researcher's philosophical and ethical perspectives.

Conclusion

Understanding research paradigms helps us see that there are many ways to study the world. By thinking about axiology, ontology, epistemology, and methodology, researchers can explore different ideas and find new answers to important questions. It's like having a map and compass to guide them on their journey of new knowledge.

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