

RESEARCH PARADIGMS AND METHODOLOGICAL CHOICES IN THE RESEARCH PROCESS

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Abstract

Purpose: *This paper tries to elucidate the key components of research paradigms ontology, epistemology and methodology that researchers should understand well to be able to apply them in their research proposals.*

Design/ Methodology/ Approach: *The method adopted is a contextual analysis that involved reviewing of materials from publications, texts and the internet.*

Findings: *The result offered stressed on how researchers can locate their research into a paradigm and the basic assumptions or justifications needed for paradigm choice.*

Implication: *Suggested solutions to challenges were discussed on identifying the different research methodologies that are best studied to conduct research in each of the paradigm discussed.*

Originality/ Value: *It was recommended that developing researchers should be properly guided on how to select research paradigms, interpretive/ constructivism and pragmatism and also how to relate these concepts to other aspects of research methodologies.*

Keywords: *Research paradigms, methodological choices, Research process, ontology, epistemology, interpretive/ constructivism, pragmatism and research proposals.*

Paper type: *Opinion research*

Introduction

One of the general themes of the Conference of Authors, Researchers and Editors was "What the editors expect from the authors." The above topic fits into this theme because it is a well-known fact that for a particular piece of research to be accepted for publication, it must have met the editors' expectations or certain publishing standards or criteria. One of such criteria is the relationship between research paradigms and methodological choices in the research process. A research paradigm ties together ontology, epistemology and methodology, design and methods in a piece of research.

A researcher is expected to locate their research paradigm within a piece of research. When this is done, it becomes easy to make informed

methodological choices that include the choice of research approaches, research designs and methods in a given research project. Developing researchers should be properly guided on how to select research paradigms such as positivism, interpretivism/constructivism and pragmatism, and also how to relate them to other aspects of research methodologies. This is crucial because editors often evaluate research projects from the perspective of this relationship. That is, how the research paradigm selected influenced the choice of research approaches, designs and methods. Discourses on the relationship between paradigms and research elements appear to be apparently lacking in the library literature, hence the need for this study. This paper therefore aims to identify major research paradigms that can be adopted by librarian researchers and demonstrate how these

paradigms influence the choice of research methodologies. The paper also provides the comparison between the research paradigms.

What is research?

Research is defined as any organized inquiry that aims at providing information for solving identified problems (Asika, 1991). It has also been defined as something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge. From these definitions, it is clear that research is a tool for solving problems, addressing societal issues and gaining knowledge. This makes it necessary for researchers to have a good understanding of the elements and processes of research. According to Makombe (2017) and Lincoln and Guba (1985), the elements of research include research paradigm, methodology, design and method. However, as noted by Okesina (2020), there is no harmony among writers and authors as to which comes first between research paradigm and methodology. Some others prefer to state the research paradigms first suggesting that research paradigm encompasses elements such as methodology and method (Lincoln and Guba, 1985, Kivunja and Kuyini, 2017). Other scholars prefer to state and discuss the methodology first, suggesting that methodology encompasses the paradigm, design and method (Igwenagu, 2016; Makombe, 2017). This debate, according to Okesina (2020), is like the old argument as to which came first: the hen or the egg; the seed of the tree.

This paper proposes that there is important relationship or connection between research paradigm and methodology. Nevertheless, the approach of this paper is to begin with the discussion on research paradigm. The reason is that it is important that any research inquiry should be guided by a paradigm or philosophy or a theoretical base (Okesina, 2020).

What is research paradigm?

The term paradigm was first introduced by Thomas Kuhn (1962) in his seminal paper, "The structure of scientific revolutions". Kuhn has defined paradigm as a philosophical way of thinking (Kivunja and Kuyini, 2017). Guba and Lincoln (1994) define paradigm as a basic

system or world view that guides the researcher or investigator (p.105). Further, Saunders et al (2009) prefer to use "philosophy" instead of 'paradigm' and has defined it as the researcher's world view or assumptions that guide their research. It is also defined as the researcher's thinking or philosophical orientation or perspective that influences what should be studied, how it should be studied, and how the results of the study should be interpreted (Okesina, 2020). It is important to note that paradigm issues are crucial, and because of this, a researcher should be clear about what paradigm informs and guides their research (Guba and Lincoln, 1994, P. 116). In other words, it is the choice of paradigm that sets down the intent, motivation, and expectations for research. Thus, without adopting a paradigm, as the first step, there is no foundation for subsequent choices regarding methodology, design and method (Okesina, 2020). He further states that it is therefore very important, that in carrying out a research or writing a research report, the paradigm in which the researcher locates the research is clearly stated.

Components of Paradigms

Researchers have advanced different components of a paradigm (Lincoln and Guba, 1985). This paper considers three components of a paradigm, namely; ontology, epistemology and methodology. The fundamental question here is; which component do we start with as the first stage in the research process? Croft (1998) argues that researchers can choose which stage to begin at, ontological, epistemological, methodology. Others stress that research is best conducted by identifying your ontological assumptions first. According to Grix (2004) research is best done by "setting out clearly the relationship between what a researcher thinks can be researched (ontological assumptions) linking it to what we can know about (epistemological assumption) and how to go about it (methodological approach), you can begin to comprehend the impact your ontological position can have on what and how you decide to study (p.68). Moreover, your ontological assumptions inform your epistemological assumptions which inform your methodology and these will give rise to

methodological approach including design and methods employed to collect data.

Ontology

Ontology is concerned with the very nature or essence of the social phenomenon we are investigating (Scotland, 2012). It can be defined also as the study of the nature of existence or reality. The assumptions about the nature of reality are crucial to understanding how you make meaning of the data you gather. Ontology is so essential to a paradigm because it helps to provide an understanding of the things that constitute the reality, while the reality is what is there to study (Scott and Usher, 2004). This means that the ontology of your research refers to the fundamental concepts which constitute themes that we analyze to make sense of the meaning embedded in research data. In other words, research data are collected on these themes for analysis and interpretation.

There are a number of ontological positions that a researcher can take in a given research. The first is, the realist ontological position also known as single reality. Realist ontology relates to the existence of one single reality which can be studied, understood and experienced. This means that a real world exists independent of human experience. This real world or reality can be understood through the researcher's sense-experience that is external, objective and independent of the research participants. (Scotland, 2012, p.10). Next is the relativist ontology which holds that the research problems have multiple realities, or that reality is constructed within the human mind, such that no one true or single reality exists. Instead, reality is relative according to how individuals experience it at any given time and place. The third is, non-singular reality ontology which argues that there is no one way to interpret reality and understand human behavior. This ontological position advocates for a pragmatic way to understand human behavior, or mixed orientation or worldview (Makombe, 2017).

Epistemology

The epistemology of a research paradigm refers to how we come to know something, how we know the truth or reality (Krauss, 2005; Nguyen, 2019), or what counts as knowledge?

The answer for 'how we know the truth or what counts as knowledge' can be drawn from sources of knowledge. Those sources are intuitive knowledge, authoritative knowledge, logical knowledge and empirical knowledge (Slavin, 1984). Another further explains these sources of knowledge thus; if you rely on form of knowledge such as beliefs, faith and intuitions, then the epistemological basis of your research is intuitive knowledge. If you rely on data gathered from experts, books and leaders in organizations, then your epistemology is grounded on authoritative knowledge. If you put emphasis on reason as the surest path to knowing the truth, then this approach is called logical knowledge. On the other hand; if you put emphasis on the understanding that knowledge is derived from objective facts, then your approach is empirical epistemology.

In considering the epistemology of your research, you ask questions like; is knowledge of reality something which has to be personally experienced and finally, what is the relationship between the researcher, the subject of research and the research participants?

There are some epistemological positions that a researcher can take in their research. The first one is objective epistemology or objectivist epistemology which argues that reality exists outside or independently, of the individual's mind. Next is subjective (or subjectivist) epistemology which argues that knowledge of reality can be generated through the researcher's personal experiences and interaction with participants (Kivunja and Kuyini, 2017). There is also the relational (or relationist) epistemology which holds that the relationships that exist between the researcher and research participants are relative to the researcher who determines what is appropriate to a particular study based on the research questions (Saunders et al, 2009; Kivunja and Kuyini, 2017).

Methodology

Methodology is the broad term used to refer to the research approaches, designs, methods and procedures used in an investigation that is well planned to find out something (Keeves, 1997). From this definition, it becomes clear that data

gathering, participants, instruments used, and data analysis are all parts of the broad field of research methodology. In considering the methodology of your research, you should ask yourself the question; How shall I go about obtaining the desired data that will enable me to answer my research question(s) and thus make a contribution to knowledge?

There are basically two types of research approaches, namely; quantitative approach and qualitative approach. However, a third approach known as mixed methods approach has been added (Creswell, 2003, 2014). Thus, what is essential is the selection of appropriate approach for a given research or inquiry (Makombe 2017). Each research approach has unique characteristics in terms of its research designs and methods. Whereas the research design is the general way the researcher seeks to proffer solution to problem raised in order to meet the research objective (Melnikovas, 2018, p. 39), research methods refer to the way or how data are collected, analyzed and interpreted (Makombe, 2017).

The way a researcher chooses to go about the research or to answer the research question is influenced by the research philosophy and the research approach employed. Under the quantitative research approach, its research designs include experimental design, quasi-experimental design, correlational design and survey design. Further, quantitative approach favours structured procedures and numerical measuring instruments for data collection such as questionnaire, measurements and tests (Makombe, 2017). Also, quantitative approach collects numerical data and uses statistical analysis such as hypothesis testing, random sampling and large samples.

If a researcher wants to go qualitative, there are different research designs that they can adopt. They are case study, grounded theory, phenomenology and ethnography and narrative inquiry. The qualitative approach uses relatively unstructured procedures and instruments for data collection such as semi-structured interviews, in-depth unstructured interviews and observations. It relies on qualitative data or data in form or words, pictures and objects and is concerned with using small samples and

purposive sampling technique (Williams, 2007; Makombe, 2017).

The mixed methods approach involves a combination of quantitative and qualitative approaches (Creswell, 2014). In this approach, the researcher incorporates methods of collecting or analyzing data from the quantitative and qualitative approaches in a single study (Shannon-Baker, 2016). Therefore, the researcher typically selects the quantitative approach to respond to research questions requiring evaluation, explanation and numerical data, whereas the qualitative approach will be selected for research questions requiring exploration and textual data, and the mixed-methods approach for research questions requiring both numerical and textual data (Williams, 2007).

Classification of research paradigm

A number of paradigms have been discussed in the literature, but there is no agreement as to the acceptable number of their classifications. For example, Scotland (2012) and Shah and Al-Bargi (2013) classified research paradigms into three namely: Positivism, Interpretivism/Constructivism and Critical theory. Guba and Lincoln (1994) classified research paradigms into four, namely; positivism, post-positivism, constructivism and critical theory. Similarly, Saunders et al (2019) classified paradigm into five which they referred to as positivism, initial realism, interpretivism, post-modernism and pragmatism. This paper will consider the commonly used paradigms in the extant literature. They are; positivism, interpretivism and pragmatism.

Positivism (or positivist paradigm)

Positivist paradigm is popularized by Augustine Comte who interprets it as a philosophy that relies on observation and reason for the purpose of understanding human behavior or that sees human beings as phenomenon which can be studied scientifically. In other words, it reduces human beings into variables which can be studied scientifically. At the ontological level, positivists assume realism or single reality (Fard, 2012, Shah and Al-Bargi, 2013), which implies that reality is objective, quantifiable and measurable through processes independent of

the researcher. At the epistemological level, positivists assume objectivism which implies that the researcher and the object to be studied are different entities, and neither of them exerts influence on the other (Guba and Lincoln, 1994; Fard, 2012). Therefore, the researcher is separated from the research participants, and this makes objective knowledge possible. Positivism is used to search for cause and effect relationships in nature, and it aims to provide explanations and to make predictions based on measurable outcomes.

Characteristics of research located within the positivist paradigm

The research located within the positivist paradigm, according to Fadhel (2002), has the following characteristics:

- Assumption that context is not important
- The belief that the truth or knowledge is “out there to be discovered by research”.
- The belief that cause and effect are separable
- The belief that research should follow the scientific method.
- Rests on formulation and testing of hypotheses
- Believes in ability to observe knowledge
- The belief that the result of inquiry can be quantified.
- Employs empirical or analytical approaches
- Belief that theory precedes research.

Based on the above research characteristics, it can be concluded that positivist paradigm advocates the use of quantitative research approach.

Interpretivism (interpretivist paradigm)

The central point of interpretivist paradigm is to understand the subjective world of human experience (Guba and Lincoln, 1989). This means that concerted effort is made to understand the viewpoint of the research observer or researcher.

This paradigm ensures that emphasis is placed on understanding the individuals and their interpretation of the world around them. For

this reason, interpretive researchers start with individuals and try to understand their interpretations of the world surrounding them, while actual words of individuals become the evidence of realities (Krauss, 2005). This means that reality is interpreted through the meanings that people give to their lives, and this meaning can be discovered through language or dialogue

The ontology of interpretivism is relativism or relativist ontology which assumes that knowledge can be gained or generated from the point of view of the individual who is directly involved. It advocates that any phenomenon being studied has multiple realities. The epistemology of interpretivism is subjectivism which holds that both the researcher and the research participants are involved in the knowing process and the reality influenced by the context (Nguyen, 2019). In other words, subjectivist epistemology assumes that the researcher makes meaning of the data through their own thinking informed by their interactions with the participants. There is the understanding that the researcher will construct knowledge socially or through their personal experiences of the real life within the natural setting being investigated (Punch, 2005). As the researcher engages the participants on interactive processes, they intermingle, dialogue, question, listen, read and write and record research data. These research data from the natural setting are gathered through interviews, discourses, text messages, etc, with the researcher acting as a participant observer.

Characteristics of research located within the interpretivist paradigm

The research located within this paradigm has the following characteristics as enumerated by Morgan (2007) and Guba and Lincoln (1985):

- The admission that the social world cannot be understood from the standpoint of an individual.
- The belief that the realities are multiple and socially constructed.
- The acceptance that the context is vital for knowledge and knowing
- The need to understand the individual rather than universal laws.
- The belief that cause and effects are mutually interdependent.

- The belief that the contextual factors need to be taken into consideration
- The belief that the words of individuals are evidence of realities

It is clear from the above characteristics that interpretivist paradigm advocates the use of qualitative approach in research projects.

The pragmatic paradigm

The pragmatic paradigm was introduced to end what was known as the “paradigm war” between the positivists and the interpretivists. This paradigm arose among the philosophers who argued that it was not possible to understand the “truth” of the real world solely by a single scientific method as advocated by the positivists paradigm, nor was it possible to determine social reality as constructed under the interpretivist paradigm (Kivunja and Kuyini, 2017). For these philosophers a mono-paradigmatic orientation was not enough rather, they argued that what was needed was a worldview which would provide methods of research or a combination of methods that could shed light in understanding the actual behavior of participants.

The above argument gave rise to a paradigm that advocates for the use of mixed methods as a pragmatic way to understand human behavior. At the ontological level, this paradigm assumes non- singular reality which holds that there is no single reality and all individuals have their own and unique interpretation of reality. The epistemology of the pragmatic paradigm is relational which assumes that relationships are best determined by what the researcher deems appropriate to a particular study.

Characteristics of research located within the pragmatic paradigm

Drawing on the works by Creswell (2003) and Martins (2005), research located within the pragmatic paradigm demonstrates the following characteristics:

- A rejection of the positivists that social science inquiry can uncover the “truth” about the real world.

- An emphasis of “workability” in research
- The use of “what works” as to allow the researcher to address the question being investigated without worrying as to whether the questions are wholly quantitative or qualitative in nature.
- Adoption of the worldview that allows for a research design and methods that are best suited to the purpose of the study.
- A rejection of the need to locate your study either in a positivist paradigm or an interpretivist paradigm.
- Choice of research methods depending on the purpose of the study or research questions.

Furthermore, it is clear from the discussion above including, the location of research within the pragmatic paradigm that this paradigm advocates for a mixed methods approach which is a combination of quantitative and qualitative research approaches.

What are the methodological implications of paradigm choice?

In this section, it is plausible to address this very important question that is often asked by researchers having decided to locate a research within a particular paradigm; which methodology shall I use? In other words, what are the methodological implications of paradigm choice? Or, as stated by Guba and Lincoln (1988) in question form; Do different inquiry paradigms imply different inquiry methodologies? A very important relationship has been reported to exist between paradigm and methodology because the methodological implications of paradigm choice permeate the research question(s), participant selections, data collection instruments and collection procedures as well as data analysis. Furthermore, the answer to the above questions is summarized in the table below on the comparison of the research paradigms and their components.

Table 1: Comparison of research paradigms and components

Paradigm	Positivist	Interpretivist	Pragmatic
Ontology	Realism or single reality	Relativist or multiple realities	Relational or non-singular reality
Epistemology	Objective	Subjective	Objective-Subjective, either or both depending on the research question(s)
Approaches	Quantitative	Qualitative	Mixed methods, or both quantitative and qualitative approaches
Design	Experimental, Quasi-experimental, Correlational, Causal-comparative	Grounded theory, Ethnography, Phenomenology, Case study, Narrative inquiry	Convergent parallel mixed methods, Explanatory sequential mixed methods, Exploratory sequential mixed methods, Embedded mixed methods
Methods	Questionnaire, Tests, Observation, Hypothesis testing, Large samples, Probability sampling technique, Statistical analysis	Semi-structured interview, In-depth unstructured interview, Focus group, observation, document analysis, Small samples, Non-probability sampling techniques, thematic analysis	Mixed methods of data collection and data analysis

Source: Kivunja and Kuyini (2017), Makombe (2017), modified by the author

Application

Table 1 will make sense if there is a demonstration on how it can be applied in the research process. Consider this research topic below:

Example: Effect of personal factors on the job performance of librarians

The Table 2 below illustrates the philosophical assumptions that informed the choice of methodological approach, design and methods of data collection and analysis

Table 2: Philosophical assumptions and methodological approach

Ontology	Epistemology	Paradigm	Approach	Design	Methods
Objective reality	Objectivism	Positivism	Quantitative	Causal-Comparative	Questionnaire, Statistical analysis

Ontological assumptions: There are personal factors that exist out there that can explain the job performance of librarians. These personal factors do not exist in the minds of librarians, rather they can be understood, identified and measured. The personal factors represent the reality to be studied, and this way, the ontology of this research topic is realism or simply an objective reality.

Epistemological assumptions: One of the epistemological questions that can help take a position here is, what is the relationship between the researcher and the subject?. Please recall that ontological assumptions inform epistemological assumptions. This implies that since the ontological assumption of

the above research topic is objective reality, then its epistemological assumption is objectivism. This means that to gather information needed for this research topic, the researcher will study the subjects without influencing them. The researcher will detach themselves from both the researched and the objects.

Paradigm: Positivism because its ontology is objective reality or single reality and its epistemology is objectivism

Research approach: This is a quantitative research because positivism advocates quantitative research methodology. The study requires formulation of hypotheses.

Design: Causal- comparative research because it helps the researcher to investigate the effect of an independent variables on a dependent variable.

Method of data collection and analysis: Questionnaire and statistical analysis of data

Conclusion

It is clear from the discussion above that paradigm as positions about ontology and epistemology have significant influence on the methodology to be used in a research project (Morgan, 2007). That is, the choice of a paradigm for your research implies that the research will be nested in a particular ontology and epistemology and that these elements will therefore guide you towards a particular methodology. Thus, the choice of a particular paradigm implies that particular methodologies must flow from that paradigm. These methodologies include research approaches, design and methods. Again, research located within a research paradigm has wide research methodologies to choose from as demonstrated in Table 1 above. It is worth nothing that it is possible to combine research methodologies within one research paradigm (e.g. pragmatic paradigm). Finally, the choice of the right research methodologies is dependent on or is usually informed by proper understanding of the different components of research paradigms.

References

Asika, N. (1991). *Research methodology in the behavioural sciences*. Lagos, Nigeria: Learn Africa Plc.

Creswell, J.N. (2014). *Research design: qualitative, quantitative and mixed methods approaches*. 4th ed. Thousand Oaks, CA: Sage.

Creswell, J.W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches*. 2nd ed. Thousand Oaks: Sage.

Fadhel, K. (2002). Positivist and hermeneutic paradigm: A critical evaluation under their structure of scientific practice. *The Sosland Journal*, 21-28.

Fard, H.D. (2012). Research paradigm in public administration. *International Journal of Humanities*, 19 (4): 55-108.

Guba, E. (1990). *The paradigm dialogues*. Sage: California.

Guba, E.G. & Lincoln, Y.S. (1988). Do inquiry paradigms imply inquiry methodologies? In: D.M. Fetterman (ed). *Qualitative approaches to evaluation in education: The scientific revolution* (pp.89-115), London: Praeger.

Guba, E.G. & Lincoln, Y.S. (1989). *What is this constructivist paradigm anyway?* In fourth generation evaluation (pp.79-90), London: Sage Publications.

Guba, E.G. & Lincoln, Y.S. (1994). *Competing paradigms in qualitative and mixed methods approaches*. In: N.K.Denzin & N.Y. Lincoln (Eds). (pp.105-117). Thousand Oaks: Sage

Igwenagu, C. (2016). *Fundamentals of research methodology and data collection*. Lambert Academic Publishing. Available at www.researchgate.net/publication/303381524.

Keeves, J.P. (1997). *Educational research methodology and measurement*. Cambridge: Cambridge University Press.

Kivunja, C. & Kuyini, A.B. (2017). Understanding and applying research paradigm in educational contexts. *International Journal of Higher education*, 6(5): 26-41.

Krauss, S.E. (2015). Research paradigm and meaning making: A printer. *The Qualitative Report*, 10(4): 758-770.

Kuln, T.S. (1962). *The structure of scientific revolutions*. Chicago, IL: University of Chicago press.

Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic inquiry*. Thousand Oak: Sage.

Makombe, G. (2017). An expose of the relationship between paradigm, method and design in research. *The Quantitative Report*, 22(12): 3363-3382.

Martens, D.M. (2015). *Research and evaluation in education and psychology*. 4th ed. Los Angeles: Sage.

Melnikovas, A (2018). Toward an explicit research methodology: Adapting research onion model for future studies. *Journal of Future Studies*, 23(2): 29-44.

Morgan, D.L. (2007). Paradigm lost and paradigm regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1): 48-76.

- Nguyen, T.T.L. (2019). *Selection of research paradigms in English language teaching: Personal reflections and future directions*. In the second annual international conference on language and literature, knE social sciences, pp.1-19. DOI: 10-18502/kss.v19.4826.
- Okesina, M. (2020). A critical review of the relationship between paradigm, methodology, design and method in research. *IORS Journal Handbook of qualitative research of Research & Method in Education*, 101): 57-68.
- Punch, R. (2005). *Introduction to social science research: Quantitative and qualitative approaches*. London: Sage.
- Saunders, M., Lewis, P. & Thornhill, A, (2019). *Research methods for business students*.8th ed. Pearson Education Limited, Financial Times Prentice Hall.
- Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and method of scientific, interpretive and critical research paradigms. *English Language Teaching*, 5(9): 9-16.
- Scott, D. & Usher, R. (2004). *Researching education: Data, methods and theory in educational inquiry*. New York: Continuum.
- Shah, S.R.& Al-Bargi (2013). Research paradigms: Researcher's worldview: Theoretical framework and study design. *Arab World English, International Peer Reviewed Journal*, 46(4): 252-264.
- Shannon-Baker, P. (2016). Making paradigms meaningful in mixed methods research. *Journal of Mixed Methods Research*, 10(4): 319-334.
- Slavin, R.E. (1984). *Research methods in education: a practical handbook*. London: Sage.
- Williams, C. (2007). Research methods. *Journal of Business and Economic Research*, 5(3): 65-72.