Journal of Research and Academic Writing
Vol. 3 No. 1 (2026): ISSN (Online): 3007-5343
DOI: https://doi.org/10.58721/jraw.v3i1.1697
Selecting Social Science Research Methods: A Literature Review of Quantitative, Qualitative and Mixed methods Approaches

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Juliana Munanie Syengo[1] & Mellitus Nyongesa Wanyama[2]
[1]*Tangaza University, Kenya*
[2]*Kabarak University, Kenya*

Article History
Received: 2025.10.29
Revised: 2026.04.18
Accepted: 2026.04.20
Published: 2026.04.28

Keywords
Positivism
Research methods
Sampling logic
Social Science

How to cite:
Syengo, J. M., & Wanyama, M. N. (2026). Selecting Social Science Research Methods: A Literature Review of Quantitative, Qualitative and Mixed methods Approaches. *Journal of Research and Academic Writing, 3*(1), 104-122.

Abstract
Despite growing recognition that methodological choices shape the credibility and relevance of social science inquiry, the field continues to grapple with three persistent gaps: inadequate methodological training, weak integration in mixed methods studies, and philosophical incoherence in research design. This literature review addresses these gaps by synthesising recent scholarship on methodological selection, examining how quantitative, qualitative, and mixed methods approaches are being deployed, integrated, and contested in contemporary social science research. The review reveals that methodological choices are driven by the nature and complexity of the research problem, philosophical alignment, data requirements, sampling logic, and practical feasibility. It further demonstrates that research objectives and questions function as the primary mechanism through which these criteria are operationalised into concrete design decisions. Quantitative methods are increasingly interrogated for reductionist tendencies; qualitative methods are being expanded and legitimised beyond exploratory roles; and mixed methods research is being refined through stricter integration frameworks and epistemological accountability. Recent studies indicate a shift toward methodological pluralism, problem-driven inquiry, and technology-enhanced research designs. Yet the field still lacks a systematic, design-stage tool for aligning research problems, philosophical assumptions, and analytical goals, a deficit that the Methodological Alignment Decision Framework (MADF) introduced here directly addresses, comprising three diagnostic tests: ontological coherence, integration necessity, and context adequacy.

Introduction

The choice of research methods in the social sciences is a significant step in research design, determining how knowledge is created, interpreted, and validated. Rather than a purely technical step, methodological selection is a process informed by theory and guided by philosophical assumptions, research objectives, and the nature of the phenomenon under study. Contemporary literature argues that social phenomena are multidimensional, context-specific and complex, thus requiring flexible and, in most instances, integrative methodological frameworks (Sidharth, 2023; Mukumbang, 2023).

Traditionally, quantitative and qualitative methods have been positioned as opposing paradigms grounded in positivist and interpretivist worldviews, respectively. Nonetheless, this strict separation has gradually been challenged by the rise of mixed methods research, which facilitates methodological pluralism and pragmatic inquiry (James et al., 2024; Hendren et al., 2023). This shift reflects a broader change in how knowledge is understood in the social sciences, in which the demands of research questions increasingly guide methodological selection, and adherence to a single philosophical is no longer standard practice. The field has consequently moved from paradigm loyalty towards a problem-oriented approach to methodological selection**.**

This review is organised around five guiding questions that provide an analytically consistent and in-depth examination of methodological selection: (1) What are the main criteria underpinning the selection of quantitative, qualitative, and mixed methods approaches? (2) How do research objectives and questions shape methodological choices? (3) What are the characteristics, applications, strengths, and limitations of quantitative and qualitative methods as discrete traditions, and how do these properties bear on the criteria identified in Question 1? (4) How is mixed methods research applied in the social sciences, and what are its advantages, challenges, and appropriate use contexts? and (5) What are the current trends and persistent research gaps in methodological selection in contemporary social science research? The answers to these questions are presented in a structured way, showing a clear analytical overview of how researchers navigate methodological decision-making in increasingly varied and evolving research settings.

Review Methodology

This review adopts a thematic narrative approach to synthesise existing scholarship on methodological selection in the social sciences. Structured around five guiding questions, it employs a PRISMA-informed search strategy to ensure transparency and rigour in identifying and selecting sources. The following paragraphs document the search protocol applied.

Searches were conducted across the following electronic databases: Scopus, EBSCOhost (Academic Search Complete), Google Scholar, JSTOR, and African Journals Online (AJOL). The search terms employed included combinations of the following: “research methods”, “methodological selection”, “quantitative research”, “qualitative research”, “mixed methods”, “social science research design”, “research paradigms”, “epistemology”, and “methodological pluralism”. Boolean operators (AND, OR) were used to combine terms and refine search results.

The inclusion criteria were as follows: peer-reviewed journal articles, book chapters, and scholarly review papers; publications in English; works published between 2023 and 2026 to capture recent methodological developments while the field remains in active theoretical development; and sources directly addressing methodological selection, research design, or epistemological frameworks in the social sciences. Sources were excluded if they were conference abstracts without full text availability, were published before 2023 without clear theoretical relevance, or addressed only domain-specific technical methods without broader methodological relevance. One preprint (Emon, 2024) was included given its direct relevance to the review; a peer-reviewed version had not been published within the scoping window at the time of writing, and its inclusion is justified by its analytical contribution.

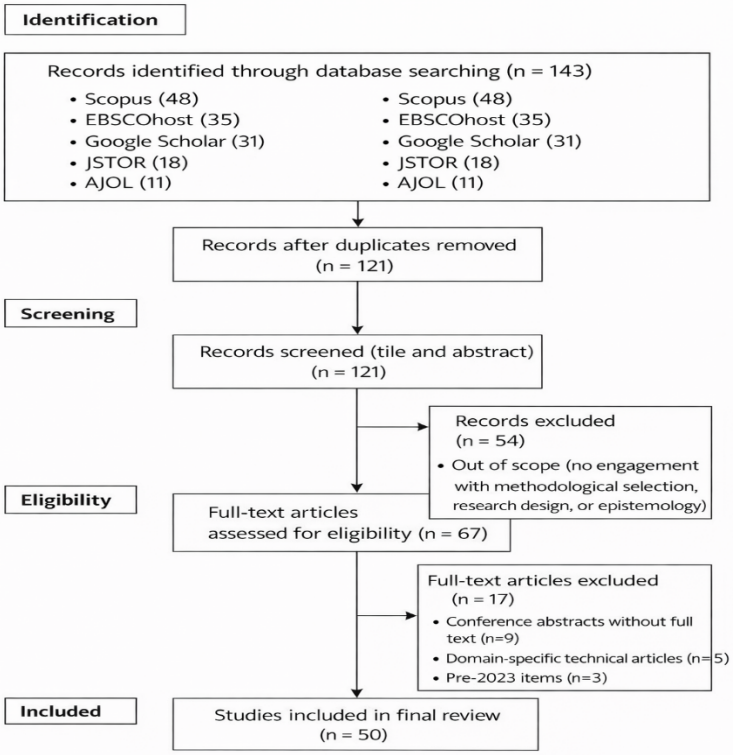

Figure 1: PRISMA Flow Diagram (2023 –2026)

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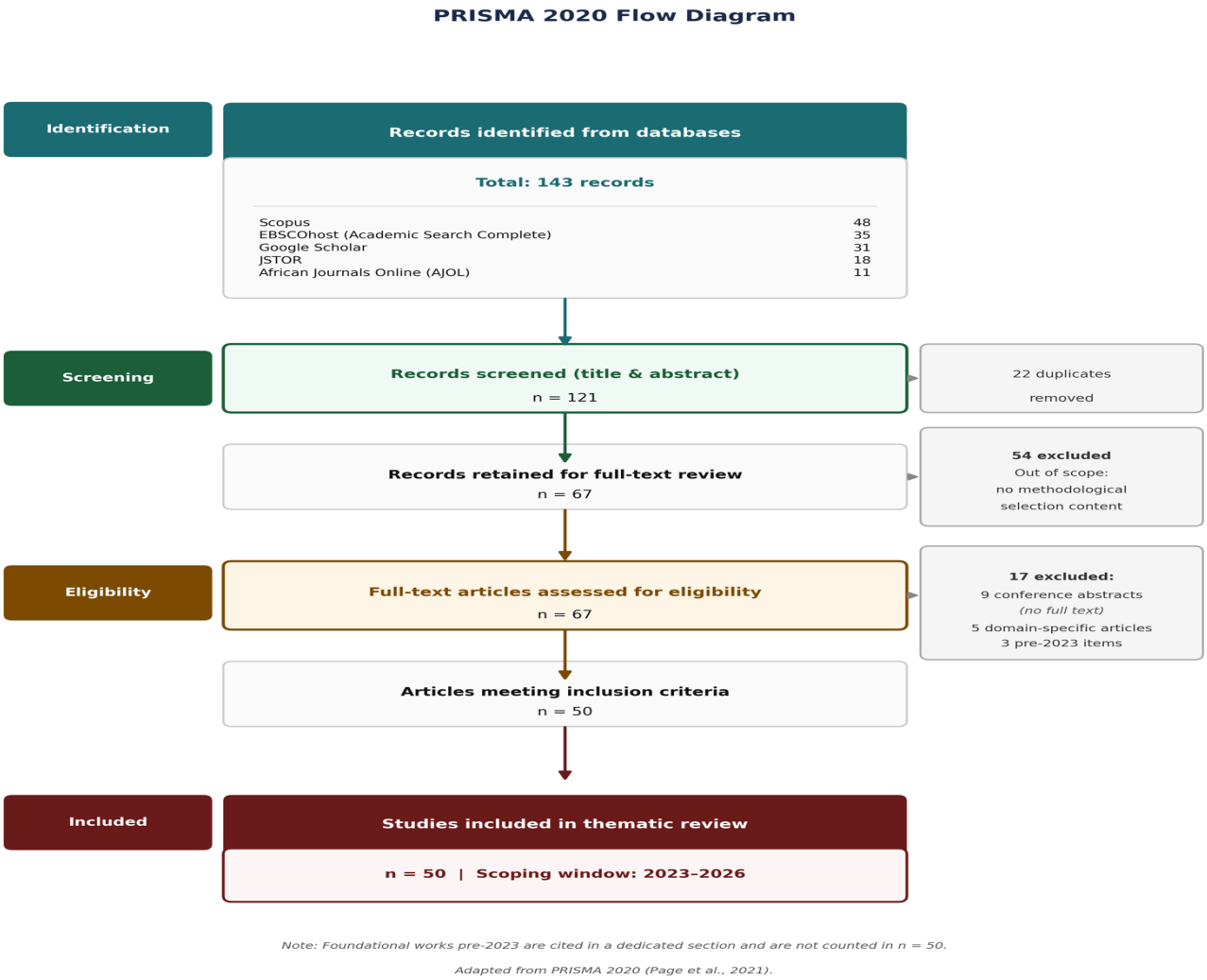

Figure 1: PRISMA-informed source selection flow diagram (scoping window: 2023–2026). Adapted from Page et al. (2021)

Foundational Literature: Canonical Works Preceding the Scoping Window

The 2023–2026 scoping window applied in this review captures recent empirical and theoretical developments. However, the conceptual architecture of methodological debates in the social sciences was substantially developed before 2023, and intellectual honesty requires that this review acknowledge and cite the foundational scholarship underpinning the frameworks deployed throughout. Several canonical works are indispensable to this review and are cited accordingly, even where they predate the scoping window.

The taxonomy of mixed methods designs typologies deployed in Section 5 convergent, explanatory sequential, exploratory sequential, embedded, transformative, and multiphase designs originates primarily with Creswell and Plano Clark (2007, 2011, 2018), whose successive editions established the field's standard typological vocabulary. The transformative design framework is associated with Mertens (2003, 2010), who situated it within an emancipatory paradigm addressing marginalised populations. The philosophical foundations of the paradigm debate that inform Section 3 draw on Guba and Lincoln (1994), whose four-paradigm framework (positivism, post-positivism, critical theory, constructivism) remains the standard reference for ontological and epistemological positioning in qualitative and mixed methods inquiry. Tashakkori and Teddlie (1998, 2003) provided the earliest systematic account of mixed methods research as a distinct methodological tradition, introducing the concept of methodological eclecticism that underlies the pragmatist case for pluralism reviewed in Section 3. Morgan (2007, 2014) subsequently reframed pragmatism as a philosophical position in its own right rather than merely a technical convenience, a distinction that is directly relevant to the critical realism debate examined in Section 3.2. Johnson and Onwuegbuzie (2004) and Johnson, Onwuegbuzie, and Turner (2007) offered the most comprehensive definition of mixed methods research and identified the range of paradigmatic stances available to mixed methods researchers. Greene (2007) analysed the five major purposes of mixed methods designs (triangulation, complementarity, development, initiation, and expansion) that remain in standard use. Biesta (2010) and Feilzer (2010) raised significant critiques of pragmatism as a philosophical foundation, arguing that the "what works" emphasis underspecifies the normative commitments of research. Bryman (2006) contributed empirical evidence on how mixed methods researchers integrate their strands, finding that integration is frequently claimed but rarely achieved. Howe (1988) provided an early and influential challenge to the incompatibility thesis, arguing against the view that quantitative and qualitative methods are philosophically incommensurable a position that remains a key reference point in the paradigm debate reviewed in Section 3. These works are cited directly relevant in the sections that follow and are listed in full in the reference list.

Criteria Influencing Methodological Selection

The process of methodological selection in social science research is multi-layered and subject to conceptual, philosophical, and practical considerations. It is not arbitrary but is guided by five interrelated criteria identified in this review: (1) the nature and complexity of the research problem, (2) philosophical and paradigmatic orientation, (3) data requirements and integration needs, (4) sampling logic, and (5) practical feasibility. These criteria do not operate independently of one another, and researchers must balance theoretical alignment, empirical requirements, and contextual constraints to arrive at a methodologically coherent design.

Nature and Complexity of the Research Problem

The nature and complexity of the research problem are key determinants of the methodological choice. Quantitative methods are best suited to well-defined, structured, and measurable problems because they enable statistical analysis and hypothesis testing. Conversely, qualitative methods are more advantageous for exploratory investigations that aim to understand meanings, experiences, and social activities in particular situations. Studies of the present day have increasingly recognised that a range of phenomena are highly complex, comprising interrelated social, institutional, and behavioural processes. These multidimensional issues are often insufficiently addressed by a single methodological approach. Mixed methods approach offers significant value in such contexts by integrating numerical measurement with contextual interpretation, thereby enhancing explanatory depth and analytical strength. Within this framing, Leso et al. (2023) are deployed as a named witness to the applicability of mixed methods within design education contexts, while Mukumbang (2023) is

specifically drawn upon to articulate the critical realist concern regarding explanatory depth and mechanism-based inference. In related but distinct applications, Pyo et al. (2023) demonstrate how qualitative approaches in healthcare settings reveal the underlying mechanisms behind aggregate quantitative outcomes, while Lim (2025) specifies the boundary conditions under which qualitative inquiry clarifies and qualifies quantitative findings. Across these deployments, sources are no longer aggregated into thematic lists but are instead adjudicated individually within their respective argumentative roles, ensuring that each citation contributes a distinct epistemic function rather than forming part of a clustered summary.

Most importantly, the conventional disposition to define research problems as either being quantitative or qualitative is now being regarded as overly simplistic. This dichotomous framing risks restricting methodological creativity and reducing researchers' ability to fully represent complex social realities. Rather, methodological appropriateness can be construed as depending on the degree to which a given approach (or combination of approaches) is sufficient to measure the particular aspects of the research problem. This view supports the growing movement toward problem-based inquiry, in which the character of the problem, per se, is the primary determinant of methodological choice.

Philosophical and Paradigmatic Orientation

Philosophical paradigms are the conceptualisations of research that directly determine the research approach and the interpretation of results. Methodological choices are thus not neutral or even technical, but are entrenched in ontological and epistemological stances about the nature of reality and the process of knowledge creation. Quantitative research is based on the positivist and post-positivist paradigms that emphasise objectivity, measurement, and causal explanation, on the premise that social reality is visible and quantifiable. Conversely, the paradigms of interpretivism and constructivism inform qualitative methods by emphasising subjective meaning, contextualised knowledge, and the co-construction of knowledge, acknowledging that social reality is multiple and socially constructed rather than fixed.

The paradigms of pragmatism, critical realism, and transformative approaches form the foundations of mixed methods research, enabling the integration of diverse evidence to explain complex social phenomena (Mukumbang, 2023; James et al., 2024; Paudel, 2024; Pretorius, 2024; Proudfoot, 2023). These paradigms emphasise flexibility, pragmatic problem-solving, and the value of integrating methodological strengths for a more comprehensive understanding. However, it is important to note that pragmatism as a philosophical foundation for mixed methods research is not without its critics. Scholars have questioned whether pragmatism provides a robust enough epistemological foundation, arguing that its emphasis on "what works" risks reducing method selection to a purely technical decision, detached from deeper ontological considerations (Paudel, 2024; Pretorius, 2024). This critique has been developed most rigorously by Morgan (2007, 2014), who argued that pragmatism is not merely a technical stance but a philosophical tradition with distinctive commitments to inquiry, community, and consequences a position that demands engagement rather than dismissal. Biesta (2010) distinguished between pragmatism as a philosophy of action (which is rich) and pragmatism as a philosophy of research (which risks conflating the usefulness of an outcome with its truth), cautioning that the latter depoliticises the normative stakes of social inquiry. Feilzer (2010) similarly argued that the pragmatist defence of mixed methods frequently underestimates the depth of the paradigmatic commitments that researchers bring to their work, making genuine integration harder, not easier. Johnson, Onwuegbuzie, and Turner (2007) proposed a dialectical pluralism that treats paradigmatic tensions as productive rather than as problems to be dissolved by pragmatic fiat.

Against this background, a more compelling case can be made for critical realism as the stronger philosophical foundation for mixed methods research because its stratified ontology provides a principled distinction between the real, the actual, and the empirical, while its morphogenetic and retroductive explanatory logic enables the coherent integration of causal analysis and interpretive understanding within a single framework (Mukumbang, 2023; Bhaskar, 1979; Archer, 1995; Danermark et al., 2002). Importantly, regardless of which paradigm a researcher adopts, the alignment between philosophical stance and methodological choice is essential for ensuring analytical coherence and credible knowledge claims. Failure to articulate this alignment clearly may generate epistemological contradictions that undermine the study's validity. Rigorous research, therefore, requires clear and deliberate engagement with underlying paradigmatic assumptions to ensure that methodological choices are logically consistent and supported by theory.

Data Requirements and Integration Needs

The type of data required in a study is closely aligned with the research goals and is a key factor in determining the choice of methodology. Quantitative research relies on structured numerical data analysed using statistical methods, which is why it is well-suited to identifying patterns, correlations, and general trends. Conversely, qualitative research uses unstructured or semi-structured data, such as interviews, observations, and texts, to explore meanings, experiences and contextual interpretations**.** This difference indicates radically different analytical goals: quantitative data are concerned with measurement and comparison, whereas qualitative data are concerned with depth and contextual insight (Barroga et al., 2023; Dehalwar and Sharma, 2024; Lim, 2025; Pyo et al., 2023).

Mixed-method designs are especially useful when research issues require combining numerical data with context (Younas & Durante, 2023). When this happens, integrating quantitative and qualitative data enhances the overall validity of the results through triangulation and enables the formulation of meta-inferences that connect statistical patterns to an explanatory level (Schoonenboom, 2023; Tang et al., 2025). Nevertheless, successful integration would require methodological planning, as a mere combination of data types without an explicit integration plan can lead to fragmented or incoherent results. Therefore, data selection and integration should be clearly defined in relation to research goals to achieve analytical consistency, validity, and overall insight (Subedi, 2023; Mukumbang, 2023).

Sampling Logic

Another criterion that sets the methodological approaches apart is sampling strategy. Quantitative research usually involves large, representative samples to facilitate generalisation, whereas qualitative research uses small, purposive samples that allow the researcher to explore in-depth. Mixed methods research involves a mixture of sampling methods to attain both breadth and depth. Research questions thus determine who or what is researched, how cases are selected, and when enough data have been gathered to achieve the research goals (James et al., 2024; Hendren et al., 2023; Willie, 2024; Bouncken et al., 2025).

Practical Feasibility

The methodological choice is also influenced by pragmatic factors, such as time, resources, the availability of research participants, and the researcher's methodological competence. Research designs are frequently influenced by logistical constraints that limit what is feasible. Nevertheless, the methodological literature emphasises that practical considerations must not be prioritised over the primacy of alignment between the research questions and methods; feasibility issues must be considered during the design phase without compromising analytical appropriateness (Gamage, 2025b; Sayfiddinovna, 2025).

Table 1 below summarises the key criteria and their differential influence across the three methodological approaches.

Table 1: Summary of criteria influencing methodological selection across quantitative, qualitative, and mixed methods approaches

Criterion	Quantitative	Qualitative	Mixed Methods
Research problem	Structured, measurable, defined	Exploratory, contextual, interpretive	Complex, multidimensional, layered
Philosophical base	Positivism, post-positivism	Interpretivism, constructivism	Pragmatism, critical realism
Data type	Numerical, structured	Textual, experiential	Both, integrated
Sampling logic	Large, representative, random	Small, purposive, theoretical	Combined — breadth and depth
Primary strength	Generalisation, replicability	Depth, contextual richness	Comprehensiveness, triangulation
Feasibility demand	Moderate–high (large N)	Moderate (time-intensive)	High (dual expertise required)

Having examined the key criteria that shape methodological selection, it is important to recognise that these criteria do not operate in isolation. A critical organising force among them is the nature of the research objectives and questions themselves, which serve as the primary mechanism through which criteria are operationalised into concrete methodological choices, as the following section demonstrates.

Role of Research Objectives and Questions in Methodological Selection

The main motivators of methodological decisions are research objectives and questions. They determine the nature of the knowledge needed, the kind of evidence required to answer the question, and the most suitable analytical approaches. The connection between research questions and the methodological choice is not accidental but structural: methodological coherence is achieved when the design is a direct consequence of the questions' requirements.

Objectives and the Goal of Inference

The goals of the research define its aims, whether they are testing hypotheses, studying lived experiences, or creating detailed explanations of social phenomena. Quantitative methods are congruent with goals that pertain to measurement, variable relationships, and generalisation. Qualitative approaches align with the goals of understanding meaning and subjective interpretation. Mixed methods designs are favoured when the research goals demand both explanation and measurement, and are characterised by the synthesis of statistical patterns and contextual richness to produce more rigorous results (Emon, 2024; Sidharth, 2023; Proudfoot, 2023).

Bethke and Rohlfing (2023) empirically show that the inference goal of researchers, either exploratory or confirmatory, or mechanism-oriented, greatly influences methodology preferences. Properly designed research objectives ensure that the problem, variables, and methods are aligned, thereby

enabling the right design choices. Such alignment guarantees logical consistency in research processes and supports the generation of valid and reliable results (Adeoye, 2024; Gamage, 2025b).

Research Questions as Methodological Determinants

A study's aims determine the most specific form of its research questions. Questions that start with how many, to what extent, or what the relationship is are usually an indication of quantitative requirements, whereas questions that start with why, how, or what it means are of a qualitative orientation. Questions that require both kinds of responses, such as how clan alliances form and why specific alliance structures persist, logically demand mixed-methods designs.

This principle is reflected in the five guiding questions, which organise this review itself. Questions 1 and 3 require synthesis of comparative evidence across methodological characteristics, tasks appropriate to a systematic literature review involving both quantitative and qualitative literature. Questions 2 and 4 involve explanatory and contextual engagement with the mechanisms by which objectives and designs interrelate. Question 5 requires both the identification of empirical trends (that can be tracked quantitatively) and the interpretation of gaps (that need qualitative reasoning). The diversity of question types thus illustrates how research questions simultaneously motivate methodological choices in primary studies — it does not constitute this literature review a mixed-methods study. A literature review is not an empirical mixed methods design; reading both quantitative and qualitative sources is the normal practice of any thematic review and does not constitute methodological integration in the technical sense defined in Section 5.

Paradigmatic Embedding of Research Questions

Research questions do not exist in a philosophical vacuum but rather within a larger ontological and epistemological presupposition that influences the manner in which knowledge is produced and the approaches deemed suitable for producing it. A research question defined in terms of a positivist ontology and an objective, measurable social reality will naturally be well-suited to quantitative methods. Qualitative approaches will align with a question formulated within a constructivist ontology, in which reality is understood as socially constructed and therefore contextual. Researchers should be clear about the paradigmatic assumptions they make in their questions, as these assumptions shape the methodological possibilities available to them and the criteria by which they assess their findings (Mukumbang, 2023; Paudel, 2024; Pretorius, 2024).

With the relationship between research objectives, questions, and methodological choice established, the review now turns to a detailed examination of the two foundational methodological traditions: quantitative and qualitative research. Understanding the distinct characteristics, applications, strengths, and limitations of each is essential for informed methodological decision-making.

Quantitative Research

Philosophical Grounding and Core Characteristics

Quantitative research falls within a positivist paradigm that holds that reality is objective, measurable, and independent of the researcher. It is typified by systematic research designs, quantitative data, and statistical analysis to test hypotheses, determine relationships between variables, and generate generalisable results. This method is deductive in nature and often starts with theory, then moves to empirical validation using standardised instruments such as surveys, experiments, and structured questionnaires. Objectivity, reliability, validity, and replicability are prioritised, and the researcher is kept at a distance to reduce bias (Barroga et al., 2023; Dehalwar and Sharma, 2024; Tuluma and Tafida, 2026).

Applications

Quantitative research is widely used in areas that require measurement, prediction, comparison, and hypothesis testing, such as public health, education, economics, psychology, and social policy. It is applied in experimental designs, longitudinal research, surveys, and statistical modelling, where large volumes of data are analysed to produce generalisable results. Randomised controlled trials and epidemiological studies in the health sciences are quantitative research designs used to investigate causal relationships and population trends. Bibliometrics and scientometrics are quantitative methods in Library and Information Science used to examine patterns of publication and information use (Oranga et al., 2025; Pandey et al., 2023; Tuluma et al., 2026).

Strengths

Quantitative research has the following strengths: it yields objective, reliable, and generalisable results. Statistical procedures and standardised instruments allow the systematic testing of hypotheses and the identification of trends in large groups. Large sample sizes increase the external validity of the findings, making them more suitable for policy formulation and evidence-based decision-making. The quantitative research design enables replicability by allowing studies to be conducted under similar conditions, thereby confirming findings (Oranga & Matere, 2025; Tuluma & Tafida, 2026).

Limitations

Among these advantages, there are significant limitations of quantitative research. Its focus on numeric representation may simplify complex social phenomena by reducing them to quantifiable variables, thereby losing their contextual and cultural sense. The design of the data collection might be limiting in terms of flexibility, since it may be hard to identify emergent issues given its structure. Large, representative samples can be difficult or expensive to obtain, and the methodology might not be sufficient to capture subjective experiences or deeper social meanings (Dehalwar and Sharma, 2024; Sayfiddinovna, 2025).

Qualitative Research

Philosophical Grounding and Core Characteristics

Qualitative research is grounded in interpretivist and constructivist paradigms, which hold that social reality is not fixed or objectively measurable, but rather multiple, contextually situated, and socially constructed. From this epistemological standpoint, knowledge is produced through the interpretive engagement between the researcher and the participants, rather than through detached observation and measurement. This tradition is inductive in its reasoning: rather than commencing with predefined hypotheses, qualitative researchers begin with open-ended inquiry and allow theoretical insights to emerge from the data. Research instruments such as in-depth interviews, focus group discussions, participant observation, and textual analysis are used to generate rich, contextually embedded accounts of human experience and meaning-making. Reflexivity is central to this approach, as researchers acknowledge their own positionality and how their perspectives may shape the inquiry and interpretation (Lim, 2025; Pyo et al., 2023; Dursun, 2023; Dzogovic and Bajrami, 2023).

Applications

Qualitative research is widely applied in sociology, anthropology, education, psychology, and healthcare, where understanding human experience, meaning, and social processes is central. It is especially useful in exploratory research, where little is known about a phenomenon, or when numerical data do not provide a sufficient account of the complex realities of a social phenomenon. It can be used in studies of patient experiences, teacher-student relationships, community processes, and

organisational culture, where the depth of understanding and contextual interpretation is more important than the generalisability (Lim, 2025; Pyo et al., 2023; Dursun, 2023; Dzogovic and Bajrami, 2023).

Strengths

As a research method, qualitative research is especially effective at producing rich, detailed and context-sensitive information about social phenomena. It documents lived experiences, meanings, feelings, and processes in society that cannot be properly captured by numerical data. Such richness allows the study of complex and changing realities, for which qualitative research can be particularly useful in generating theory and exploring them. Its dynamic nature enables researchers to adapt to discoveries throughout the process, ensuring that new knowledge is reflected in the analysis and interpretation (Lim, 2025; Pyo et al., 2023; Mantula et al., 2024).

Limitations

Qualitative research also has limitations. Its reliance on small, non-representative samples limits generalisability, making it difficult to apply the findings to wider populations**.** The interpretive nature of analysis introduces the possibility of researcher bias, which can affect the consistency and reliability of findings. Furthermore, qualitative research is often time-consuming and resource-intensive due to the depth of data collection and analysis involved (Gamage, 2025a; Sayfiddinovna, 2025; Bouncken et al., 2025).

Table 2: Comparison of the two methodological approaches

Dimension	Quantitative	Qualitative
Ontology	Objective, single reality	Subjective, multiple realities
Epistemology	Positivist / post-positivist	Interpretivist / constructivist
Reasoning	Deductive	Inductive
Data	Numerical, structured	Textual, experiential
Instruments	Surveys, experiments, scales	Interviews, focus groups, and ethnography
Analysis	Statistical (regression, SEM, ANOVA)	Thematic, narrative, grounded theory
Sample	Large, random, representative	Small, purposive, theoretical
Strength	Generalisation, objectivity	Depth, contextual meaning
Limitation	Reductionism, limited contextual depth	Subjectivity, limited generalizability

The preceding comparative analysis of quantitative and qualitative methods reveals that each tradition has distinct strengths and limitations, making it better suited to particular research contexts. Where the complexity of a research problem exceeds what either approach can address alone, mixed methods research offers an integrative solution, as examined in the following section.

Mixed Methods Research: Application, Advantages, Challenges, and Appropriate Use Contexts

Conceptualisation and Rationale

Mixed methods studies are based on the idea that they offer a practical, integrative approach, combining quantitative and qualitative methods to examine complex social phenomena more comprehensively. Mixed methods, as opposed to merely coexisting with both techniques, entail the systematic integration of both techniques across research design, data collection, analysis, and interpretation. Quantitative elements provide structured numerical data that help identify patterns and general trends, whereas qualitative elements offer contextual and interpretive insights. Combined, they enable the study of social phenomena at multiple levels, leading to a more comprehensive understanding (Aramide et al., 2023; Subedi, 2023).

Design Typologies

Mixed methods research is implemented through a range of design typologies that differ in terms of timing, sequencing, and the integration of quantitative and qualitative components. The typological vocabulary used in this section originates primarily with Creswell and Plano Clark (2007, 2011, 2018), whose successive editions established the convergent, explanatory sequential, exploratory sequential, and embedded designs as the field's standard classification. The transformative design was developed by Mertens (2003, 2010) as an equity-oriented framework, and the multiphase design is elaborated in Creswell and Plano Clark (2011, 2018) for longitudinal and programme evaluation contexts. The convergent design is one of the most popular methods where quantitative and qualitative data are gathered simultaneously and analysed independently, and then incorporated in the interpretation process in order to determine convergence or divergence in results. By contrast, the explanatory sequential design is a two-phase format in which quantitative data are gathered and analysed, followed by a qualitative inquiry to explain or elaborate on the statistical findings. This design is especially helpful when initial quantitative results need more contextual interpretation.

Alternatively, the exploratory sequential design would use the same sequence but in reverse, starting with qualitative exploration and proceeding to generate insights used to develop quantitative instruments or hypotheses. The other typical method is the embedded design, where one type of data is nested within the other as a supplementary element, usually within a dominant quantitative or qualitative paradigm. Higher-order typologies include transformative and multi-phase designs, which are employed in more complex, longitudinal, or equity-oriented research involving multiple cycles of data collection, analysis, and synthesis. The flexibility of these design typologies makes mixed methods research particularly well-suited to complex social environments where a single methodological approach cannot adequately capture the full scope of the research problem (Sharma et al., 2023; Tzagkarakis and Kritas, 2023; El Sherif et al., 2024).

Strengths and Advantages

Mixed methods research has strengths associated with many unique abilities. First, triangulation: conclusions from other methods are compared and combined to strengthen the overall conclusions. Second, complementarity: breadth and depth are integrated, allowing for statistical generalisation and contextual understanding. Third, development: outcomes of one strand influence or correct the other, enhancing the quality and theoretical accuracy of instruments. Fourth, explanation: unexpected quantitative outcomes can be explained by qualitative insights, thereby enhancing explanatory power. Fifth, expansion: the area of inquiry may be broadened by addressing various research sub-questions using appropriate approaches. Such benefits are especially associated with mixed methods as a valuable tool in policy research, education, governance, healthcare, and interdisciplinary research (Sharma et al., 2023; Subedi, 2023; Mejeh et al., 2023; Mekheimer, 2025).

Challenges and Limitations

There are various challenges with mixed methods research. It is complex both methodologically and philosophically, requiring the integration of positivist and constructivist paradigms in ways that can generate epistemological tensions. It is time-consuming, resource-intensive and demands higher levels of methodological expertise than single-method studies. Combining qualitative and quantitative results in a coherent, meaningfully integrative fashion requires a deliberate integration logic, a requirement that many published mixed methods studies fail to meet. There are other issues, including a lack of clarity in distinguishing mixed methods as a methodology from mixed methods as a design, and institutional biases that occasionally favour single-method research (Aramide et al., 2023; Grant et al., 2023; Mukumbang, 2023; Younas and Durante, 2023). Of these challenges, the evidence consistently identifies weak integration as the most prevalent and consequential. Studies that treat quantitative and qualitative strands as parallel rather than convergent outputs negate the central rationale for mixed methods research and produce findings that are less than the sum of their parts (Subedi, 2023; Mukumbang, 2023). Contrary to the view that complexity and resource demands are the primary barriers, the most tractable challenge and the one with the greatest impact on research quality is the absence of deliberate integration planning at the design stage, which researchers can address through the use of structured integration frameworks such as joint displays and meta-inferences (Younas and Durante, 2023).

Appropriate Use Contexts

Mixed methods research is best suited when: the research problem is too complex to be sufficiently addressed by a single methodological perspective; the research aims require both pattern confirmation and contextual description; initial results from one strand raise questions that must be addressed by the other; the study is longitudinal and requires different methods at different stages; or equity and social justice concerns demand both the amplification of marginalised voices and population-based data. It should be noted, however, that mixed methods must not be selected merely to convey comprehensiveness; integration must be theoretically justified and procedurally specified from the outset (James et al., 2024; Tzagkarakis and Kritas, 2023; Leso et al., 2023).

The discussion of mixed methods frameworks concludes the review of the three main methodological approaches. The final section situates these traditions within the current context of social science research, identifying emerging trends shaping methodological practice and ongoing gaps that still limit the field's development.

Recent Trends and Research Gaps in Methodological Selection

Emerging Trends

Contemporary social science research is undergoing a pragmatic reorientation, in which methodological choices are increasingly guided by the nature and demands of research questions rather than by adherence to traditional paradigms. It is important to note, however, that the notion of "paradigm wars" is itself a contested historiographic construct rather than a settled historical fact. Gage (1989) identified the incompatibility thesis as a rhetorical overstatement; Bryman (2006) demonstrated empirically that mixed methods researchers rarely achieve genuine paradigmatic integration regardless of their declared philosophical position; and Morgan (2007) argued that the war's narrative was more useful as a heuristic for framing the mixed methods turn than as an accurate account of past practice. Treating the shift as straightforward historical progress thus risks reproducing the same simplification it purports to correct. The current trajectory is better characterised as a pragmatic reorientation, in which analytical relevance and flexibility are prioritised (Subedi, 2023; Mantula et al., 2024). Methodological pluralism is increasingly accepted, with mixed

methods approaches now considered essential for addressing complex, multidimensional social phenomena that cannot be adequately represented by a single methodological framework (Subedi, 2023; Aramide et al., 2023).

Moreover, mixed methods designs have diversified, and researchers have embraced more complex and sophisticated designs, such as multiphase, transformative, and comparative qualitative analyses. The developments are indicative of a growing degree of methodological sophistication and the readiness to adapt research designs to the complexities of empirical situations (Adeniran et al., 2024; El Sherif et al., 2024). The evolution has been further boosted by technological development, whereby the accuracy and efficiency of the research process have been improved through the use of statistical software, advanced measurement models, fuzzy logic, and qualitative analysis tools aided by artificial intelligence (Adeniran et al., 2024; Rokeman, 2024). Moreover, interdisciplinary methodological borrowing has helped social scientists by broadening the scope of instruments they can use in their research, as techniques from other fields, such as the health sciences, law, and engineering, are also being incorporated into the social sciences. This cross-disciplinary dialogue continues to contribute to methodological innovation and the expansion of the analytical power of modern social scientific investigation (Hamzani et al., 2023; Kojonsaari and Palm, 2023).

Persistent Research Gaps

Despite these methodological improvements, many gaps remain that limit the quality, coherence, and applicability of social science research. A significant gap is the lack of methodological training, especially in statistical literacy, qualitative research rigour, and competence in integrating mixed methods. These gaps are rampant throughout graduate training programmes and continue to affect researchers' capacity to design and conduct methodologically appropriate studies (Nind & Katramadou, 2023).

The other significant loophole is poor integration in mixed methods studies. Despite the many studies purporting to use mixed methods designs, they are not always able to incorporate qualitative and quantitative strands meaningfully. Rather, the two elements are often reported separately, with independent findings and conclusions, thereby undermining the essence of methodological integration and limiting the formulation of overall meta-inferences (Subedi, 2023; Mukumbang, 2023).

Another worry is methodological incoherence in the choice of methods. Most researchers adopt methodologies without clearly relating them to the right ontological and epistemological assumptions and thus end up with studies that are not consistently conceptual. This undermines the rationality of research designs and influences the validity and interpretative power of results (Paudel, 2024; Pretorius, 2024). Moreover, the overrepresentation of Western and high-income-country contexts in the methodological literature limits the applicability of proven methodological guidance across diverse socio-cultural and institutional contexts, especially in the Global South (Nind & Katramadou, 2023; Subedi, 2023). This overrepresentation is not merely a gap in coverage but an epistemological problem: methodological guidance developed primarily for Euro-American institutional and knowledge contexts may carry ontological assumptions about individualism, linearity of inquiry, and the separation of researcher and researched that do not translate to African or other Global South contexts without critical adaptation. Chilisa (2012) articulated this most comprehensively in her account of indigenous research methodologies, demonstrating that the very categories of quantitative and qualitative research are themselves culturally situated rather than universal. Mkabela (2005) developed the Afrocentric research framework as a corrective to Western-dominated paradigms in African educational research. Ndofirepi and Gwaravanda (2019) and Cooper and Morrell (2014) further examined how African philosophical traditions can be brought into dialogue with mainstream

methodological debates to produce more contextually adequate research designs. For a manuscript authored by scholars based in Kenya and submitted to a journal with an explicit African mandate, engagement with this body of work is not optional; it is an intellectual and ethical responsibility. Future source selection should deliberately include African Journals Online and African-authored scholarship on methodology, and the discussion of methodological gaps should be reframed to acknowledge that what counts as a gap is itself context-dependent.

Also, a lack of clarity in identifying research gaps, where researchers tend to make loose or poorly justified statements about them, undermines problem formulation and interferes with the accumulation of knowledge (Ait Aissi & Ghomari, 2025). Lastly, the scarcity of methodological innovation in resource-constrained settings is another critical gap, as researchers in such settings are limited by structural and financial constraints in conducting rigorous quantitative, qualitative, and mixed-methods research, yet are comparatively poorly served by tailored methodological advice (Nind & Katramadou, 2023).

A Methodological Alignment Decision Framework

A synthesis of the evidence reviewed across the five guiding questions yields a conceptual contribution that this review is positioned to offer: a Methodological Alignment Decision Framework (MADF) for social science researchers. The MADF integrates the five interdependent criteria identified in Section 3, research problem structure, philosophical paradigm, data requirements, sampling logic, and feasibility into a sequential decision procedure with three diagnostic tests that researchers can apply at the design stage.

Test 1: The Ontological Coherence Test. Can the researcher articulate a clear ontological position (realist, relativist, or critically realist) that is consistent with both the research question and the proposed method of analysis? If no alignment can be articulated, the design should be revised before proceeding, since an unresolved ontological contradiction will propagate through every subsequent methodological decision. Test 2: The Integration Necessity Test. Does the research problem genuinely require the combination of numerical pattern identification and contextual depth of meaning, such that findings from one strand are incomplete without findings from the other? If yes, a mixed methods design is epistemically justified; if no, a single-method design is likely more rigorous. This test directly operationalises the distinction between genuine integration and the additive use of multiple methods for the appearance of comprehensiveness identified by Bryman (2006) and Mukumbang (2023). Test 3: The Context Adequacy Test. Has the researcher considered whether the ontological assumptions embedded in the chosen methodological tradition are appropriate to the socio-cultural and institutional context of the study? For researchers working in the Global South or studying communities whose epistemological frameworks differ from those presupposed by Euro-American methodological traditions, this test requires explicit engagement with indigenous or local epistemologies (Chilisa, 2012; Cooper & Morrell, 2014). The MADF does not prescribe outcomes; it provides a structured sequence of questions that compel researchers to articulate and defend the alignment between their problem, paradigm, and procedure — the three axes on which methodological coherence depends.

Conclusion

This literature review has shown that the process of choosing the methods of social science research is a multidimensional and complex process that involves the interplay of research problems, objectives, philosophical paradigms and practical restrictions. The review indicates that the methodological choice is largely informed by the nature and structure of the research problem, adherence to ontological and epistemological assumptions, data needs, sampling logic, and feasibility

issues. It also confirms that research goals and questions are the main determinants of methodological direction as they define the kind of evidence needed and the method of analysis.

The review also verifies that quantitative and qualitative methodologies do not provide overlapping contributions to social scientific inquiry but rather complementary contributions. Quantitative methods focus on measurement, structure, and generalisability, whereas qualitative methods give depth, meaning, and contextual insight into social phenomena. Mixed methods research has become a practical, integrative approach that combines both traditions to address complex research issues more *co*mprehensively, provided it is well-designed and meaningfully integrated.

Moreover, the review highlights emerging trends such as methodological pluralism, problem-driven inquiry, and the increasing use of technological tools in research processes. Nevertheless, there are ongoing challenges, such as methodological training, weak integration within mixed-methods research, and inconsistency in the philosophical foundations of research design. These gaps need to be addressed to enhance methodological rigour, improve research quality, and strengthen the relevance of social science research. Future research should focus on underrepresented contexts, particularly non-Western contexts, and develop more context-sensitive models for method selection and capacity building.

References

Adeniran, A. O., Asifat, J. T., Familusi, O. B., & Folorunso, S. S. (2024). Critical analysis of research methods and misperceptions of statistical analysis. *International Journal of Innovation in Management, Economics and Social Sciences, 4*(3), 29–50.

Adeoye, M. A. (2024). Mastering the basics: A guide to research methodology for effective writing and publication. *Chalim Journal of Teaching and Learning, 4*(1), 30–41.

Ait Aissi, H., & Ghomari, F. (2025). Identifying research gaps in social sciences. *Daftar Al-Buhuth Al-'Ilmiyyah, 13*(1), 344–363.

Aramide, K. A., Jacob, U. S., & Pillay, J. (2023). Conceptualisation and contextualisation of mixed methods research: A review. *Research in Social Sciences and Technology, 8*(4), 14–36. https://doi.org/10.46303/ressat.2023.31

Archer, M. S**.** (1995). *Realist social theory: The morphogenetic approach.* Cambridge University Press.

Barroga, E., Matanguihan, G. J., Furuta, A., Arima, M., Tsuchiya, S., Kawahara, C., & Izumi, M. (2023). Conducting and writing quantitative and qualitative research. *Journal of Korean Medical Science, 38*(37). https://doi.org/10.3346/jkms.2023.38.e291

Bethke, F., & Rohlfing, I. (2023). How do researchers choose their goals of inference? *Research & Politics, 10*(2). https://doi.org/10.1177/20531680231170969

Bhaskar, R. (1979). *The possibility of naturalism: A philosophical critique of the contemporary human*

Biesta, G. (2010). Pragmatism and the philosophical foundations of mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *SAGE handbook of mixed methods in social & behavioral research* (2nd ed., pp. 95–117). SAGE.

Bouncken, R. B., Czakon, W., & Schmitt, F. (2025). Purposeful sampling and saturation in qualitative research methodologies. *Review of Managerial Science*, 1–37. https://doi.org/10.1007/s11846-025-00881-2

Bryman, A. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research, 6*(1), 97–113. https://doi.org/10.1177/1468794106058877

Chilisa, B. (2012). *Indigenous research methodologies*. SAGE.

Cooper, L., & Morrell, R. (Eds.). (2014). *Africa-centred knowledges: Crossing fields and worlds*. James Currey.

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research*. SAGE.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). SAGE.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE.

Danermark, B., Ekström, M., Jakobsen, L., & Karlsson, J. C. (2002). *Explaining society: Critical realism in the social sciences*. Routledge.

Dehalwar, K. S. S. N., & Sharma, S. N. (2024). Exploring the distinctions between quantitative and qualitative research methods. *Think India Journal, 27*(1), 7–15. https://doi.org/10.5281/zenodo.10553000

Dursun, B. (2023). A qualitative research technique: Interview. *Disiplinlerarası Eğitim Araştırmaları Dergisi, 7*(14), 100–113. https://doi.org/10.57135/jier.1245193

Dzogovic, S. A., & Bajrami, V. (2023). Qualitative research methods in science and higher education. *Journal of Human Research in Rehabilitation, 13*(1), 156–166. https://doi.org/10.21554/hrr.042318

El Sherif, R., Pluye, P., Hong, Q. N., & Rihoux, B. (2024). Using qualitative comparative analysis as a mixed-methods synthesis in systematic mixed-studies reviews. *Research Synthesis Methodology*. https://doi.org/10.1002/jrsm.1698

Emon, M. M. H. (2024). *Research approach: A comparative analysis of quantitative and qualitative methodologies in social science research*. https://doi.org/10.20944/preprints202412.1128.v1

Feilzer, M. Y. (2010). Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. *Journal of Mixed Methods Research, 4*(1), 6–16. https://doi.org/10.1177/1558689809349691

Gage, N. L. (1989). The paradigm wars and their aftermath: A "historical" sketch of research on teaching since 1989. *Educational Researcher, 18*(7), 4–10.

Gamage, A. N. (2025a). A comparative analysis of qualitative and mixed methods research: Strengths, limitations, and practical applications. *World Journal of Advanced Research and Reviews, 25*(3), 2040–2046. https://doi.org/10.30574/wjarr.2025.25.3.0947

Gamage, A. N. K. K. (2025b). Research design, philosophy, and quantitative approaches in scientific research methodology. *Scholars Journal of Engineering and Technology, 13*(2), 91–103. https://doi.org/10.36347/sjet.2025.v13i02.004

Grant, D. B., Shaw, S., Sweeney, E., Bahr, W., Chaisurayakarn, S., & Evangelista, P. (2023). Using mixed methods in logistics and supply chain management research. *The International Journal of Logistics Management, 34*(7), 177–198. https://doi.org/10.1108/IJLM

Greene, J. C. (2007). *Mixed methods in social inquiry*. Jossey-Bass.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). SAGE.

Hamzani, A. I., Widyastuti, T. V., Khasanah, N., & Rusli, M. H. M. (2023). Legal research method: Theoretical and implementative review. *International Journal of Membrane Science and Technology, 10*(2), 3610–3619.

Howe, K. R. (1988). Against the quantitative-qualitative incompatibility thesis or dogmas die hard. *Educational Researcher, 17*(8), 10–16. https://doi.org/10.3102/0013189X017008010

James, T. G., DeJonckheere, M., & Guetterman, T. C. (2024). Integrating transformative considerations and quantitative results through a participant selection joint display in explanatory sequential mixed methods studies. *Journal of Mixed Methods Research, 18*(1), 14–30.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14–26.

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research, 1*(2), 112–133.

Kojonsaari, A.-R., & Palm, J. (2023). The development of social science research on smart grids: A semi-structured literature review. *Energy, Sustainability and Society, 13*(1). https://doi.org/10.1186/s13705-023-00381-9

Leso, B. H., Cortimiglia, M. N., & Ghezzi, A. (2023). The contribution of organisational culture, structure, and leadership factors in the digital transformation of SMEs: A mixed methods approach. *Cognition, Technology & Work, 25*(1), 151–179. https://doi.org/10.1007/s10111-022-00714-2

Lim, W. M. (2025). What is qualitative research? An overview and guidelines. *Australasian Marketing Journal, 33*(2), 199–229. https://doi.org/10.1177/14413582241264619

Mantula, F., Mpofu, A. C., Mpofu, F. Y., & Shava, G. N. (2024). Qualitative research approach in higher education: Application, challenges and opportunities. *East African Journal of Education and Social Sciences, 5*(1), 1–10. https://doi.org/10.46606/eajess2024v05i01.0343

Mejeh, M., Hagenauer, G., & Gläser-Zikuda, M. (2023). Mixed methods research on learning and instruction. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 24*(1). https://doi.org/10.17169/fqs-24.1.4027

Mekheimer, M. (2025). Technological self-efficacy, motivation, and contextual factors in advanced EFL e-learning: A mixed methods study. *Humanities and Social Sciences Communications, 12*(1), 1–18. https://doi.org/10.1057/s41599-025-04947-0

Mertens, D. M. (2003). Mixed methods and the politics of human research: The transformative-emancipatory perspective. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 135–164). SAGE.

Mertens, D. M. (2010). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (3rd ed.). SAGE.

Mkabela, Q. (2005). Using the Afrocentric method in researching indigenous African culture. *The Qualitative Report, 10*(1), 178–189.

Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research, 1*(1), 48–76. https://doi.org/10.1177/2345678906292462

Morgan, D. L. (2014). *Integrating qualitative and quantitative methods: A pragmatic approach*. SAGE.

Mukumbang, F. C. (2023). Retroductive theorising: A contribution of critical realism to mixed methods research. *Journal of Mixed Methods Research, 17*(1), 93–114.

Ndofirepi, A. P., & Gwaravanda, E. T. (2019). Epistemological (in)justice in African universities: A perspective of the students. *Educational Review, 71*(5), 581–593. https://doi.org/10.1080/00131911.2018.1435610

Nind, M., & Katramadou, A. (2023). Lessons for teaching social science research methods in higher education: Synthesis of the literature 2014–2020. *British Journal of Educational Studies, 71*(3), 241–266. https://doi.org/10.1080/00071005.2022.2092066

Oranga, J., & Matere, A. (2025). Quantitative research: Types, advantages, generalizability, and limitations. *Open Access Library Journal, 12*, 1–9. https://doi.org/10.4236/oalib.1113694

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Gluud, C., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., Stewart, L. A., Thomas, J., Tricco, A. C., Welch, V. A., Whiting, P., & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Pandey, P., Madhusudhan, M., & Singh, B. P. (2023). Quantitative research approach and its applications in library and information science research. *Access: An International Journal of Nepal Library Association, 2*(01), 77–90. https://doi.org/10.3126/access.v2i01.58895

Paudel, P. (2024). Examining paradigmatic shifts: Unveiling the philosophical foundations shaping social research methodologies. *Journal of the University of Ruhuna, 12*(1), 45–58. https://doi.org/10.4038/jur.v12i1.8033

Pretorius, L. (2024). Demystifying research paradigms: Navigating ontology, epistemology, and axiology in research. *The Qualitative Report, 29*(10), 2698–2715.

Proudfoot, K. (2023). Inductive/deductive hybrid thematic analysis in mixed methods research. *Journal of Mixed Methods Research, 17*(3), 308–326. https://doi.org/10.1177/15586898221126816

Pyo, J., Lee, W., Choi, E. Y., Jang, S. G., & Ock, M. (2023). Qualitative research in healthcare: Necessity and characteristics. *Journal of Preventive Medicine and Public Health, 56*(1), 12. https://doi.org/10.3961/jpmph.22.451

Rokeman, N. R. (2024). Likert measurement scale in education and social sciences: Explored and explained. *EDUCATUM Journal of Social Sciences, 10*(1), 77–88.

Sayfiddinovna, R. D. (2025). Quantitative and qualitative research methodologies: A comparative analysis of their application and limitations. *Journal of Modern Educational Achievements, 10*(10), 55–58.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches*. SAGE.

Tashakkori, A., & Teddlie, C. (Eds.). (2003). *Handbook of mixed methods in social and behavioural research*. SAGE.