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# MIXED METHODS RESEARCH: MERITS, APPLICATIONS AND CHALLENGES

By  
**Josephine Oranga**  
Kisii University, Kenya  
Email: [josephineoranga@kisiuniversity.ac.ke](mailto:josephineoranga@kisiuniversity.ac.ke)

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## ABSTRACT

*Mixed methods research is an approach that draws from the strengths of both quantitative and qualitative research methodologies, resulting in richer insights and more robust conclusions. This article, thus, explores the merits, applications and challenges associated the mixed methods approach through a synthesis of studies published between 2006 and 2023. According to this analysis, the advantages of the mixed methods approach include: comprehensive understanding of the research problem, validation of data through triangulation, flexibility and adaptability during the research process, yields rich and contextualized data, provides both depth and breadth to the study and enhances interpretation of findings. On the other hand, some of the challenges are: requires additional financial resources and time, requires one to possess expertise in both qualitative and quantitative approaches, the challenge of integrating qualitative and quantitative data and the challenge of interpreting the findings. This review, thus, concludes that the integration of both qualitative and quantitative approaches is powerful and enables researchers to tap into the strengths of both approaches (qualitative and quantitative), thereby providing a fuller, more nuanced understanding of the phenomena under study*

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## Corresponding Author:

**Josephine Oranga**  
Kisii University, Kenya  
Email: [josephineoranga@kisiuniversity.ac.ke](mailto:josephineoranga@kisiuniversity.ac.ke)

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## 1. INTRODUCTION

Research methodologies play a crucial role in the way data is collected, analyzed, and interpreted. In the academic world, traditional research methods have typically been categorized into two broad types: qualitative and quantitative. Qualitative research involves exploring phenomena in depth through interviews, focus group discussions, observations, and textual analysis (Oranga & Matere, 2023), whereas quantitative research focuses on numerical data and statistical analysis to generalize findings across larger populations. However, due to limitations in both qualitative and quantitative methodologies when used alone, researchers are increasingly opting to integrate both of them in studies to produce more comprehensive findings in response to the phenomenon under study. The mixed methods research approach, thus, provides more comprehensive answers to complex research questions that cannot be fully addressed by either method alone (Creswell & Plano Clark, 2017).

Noteworthy, the 1950s to early 1960s witnessed protracted arguments and debates on qualitative and quantitative research methodologies. Quantitative and qualitative research approaches were perceived as two opposing paradigms, each with its own proponents and supporters, most of whom would not have envisioned the possibility of merging the two methodologies. This period of protracted debates about qualitative and quantitative methodologies is often referred to as "the paradigm wars" period. Eventually, paradigmatic puritanism was rejected, leading to the emergence pragmatism (mixed methods) as a conciliatory research approach between conflicting qualitative and quantitative methodologies. The mixed methods approach is embedded in the concept of triangulation and is grounded in post-positivism and pragmatist philosophies. The flexibility of the mixed methods

research approach supports the combination of numerical data with rich, descriptive data to produce well-rounded, comprehensive insights.

This systematic review, therefore, examines the application of the mixed methods approach in research by evaluating the advantages and challenges of using mixed methods research across diverse disciplines and explores how it enhances the depth and validity of findings. The review also provides recommendations for researchers considering the adoption of the mixed methods approach in their studies.

## 2. METHODOLOGY

This review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which are designed to standardize the process of systematic reviews and improve the transparency and reproducibility of findings. The following steps were followed in conducting the review

### *Eligibility Criteria*

The study considered studies published between 2006 and 2023 in peer-reviewed journal articles, conference papers and dissertation from databases such as Google Scholar, PubMed, JSTOR, ERIC and ScienceDirect. Keywords used in the search included "mixed methods," "quantitative and qualitative research," "methodological integration," and "systematic review."

A total of 55 studies were initially identified and after screening titles, abstracts, and full-texts, 18 studies met the inclusion criteria and were analyzed in-depth for the review. Thereafter, key data were extracted, including study design and the methods used to integrate qualitative and quantitative data. Studies were assessed for their methodological rigor and the impact of mixed methods on research findings.

The quality of the studies was assessed using the Joanna Briggs Institute (JBI) critical appraisal checklist for mixed methods research to ensure methodological soundness and credibility. Ultimately, a narrative synthesis was performed to summarize the findings, highlighting both the benefits and challenges associated with the mixed methods approach.

## 3. RESULTS AND DISCUSSION

The results of this analysis are classified into two categories; the advantages of using the mixed methods approach and the challenges of utilizing it, as presented in the sub-sections below:

### **The Advantages of Mixed Methods Research**

The advantages of the mixed method approach are discussed as below:

#### *Comprehensive Understanding of the Research Problem*

One of the main advantages of mixed methods research is its ability to provide a more comprehensive understanding of a research problem. While quantitative research often focuses on measuring and analyzing numerical data to identify patterns, qualitative research offers a deeper exploration of people's experiences, attitudes, and perceptions (Oranga & Matere, 2023). By combining these two approaches, researchers are able to capture the full range of data relevant to the study, which may ultimately help in understanding complex social, behavioral, or organizational phenomena. This integration allows researchers to explore the depth and nuances of a topic (qualitative) while also providing statistical generalizability (quantitative) (Tashakkori & Teddlie, 2010; Halcomb & Hickman, 2015; Molina-Azorin, 2011)

#### *Triangulation of Data*

Mixed methods research enhances the validity and reliability of research findings through triangulation. Triangulation refers to the merging of data sets, methods or theories in a bid to comprehensively respond to research question. Johnson et al (2007) also indicate that the mixed methods approach facilitates triangulation, which involves cross-checking data from different methods to ensure the validity and reliability of the findings. The approach helps to verify results from both qualitative and quantitative perspectives, eventually strengthening the overall conclusions of the study.

Tashakkori and Teddlie (2010) also note that when researchers combine qualitative and quantitative data, they cross-validate findings, making it more likely that the results are accurate and robust. Accordingly, if one method reveals contradictory results, the other method can help explain or clarify these inconsistencies. Hence, mixed methods approach provides a way to "converge multiple perspectives" to increase the credibility and trustworthiness of research conclusions while also checking the consistency of research results (Jogulu & Pansiri, 2011).

#### *Rich and Contextualized Data*

Another benefit of mixed methods research is that it allows for the collection of both detailed and broad data. Qualitative methods, such as interviews or case studies, provide rich, contextualized data that can help explain the "why" and "how" behind certain phenomena, while quantitative methods provide statistical data to identify general trends (Ivankova, Creswell & Stick, 2006). Combining these data types allows researchers to not only identify



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correlations and patterns but also to understand the underlying reasons or mechanisms that drive those patterns. For instance, a study on student satisfaction might use a survey (quantitative) to measure overall satisfaction levels and follow up with interviews (qualitative) to explore the reasons behind those levels of satisfaction (Creswell & Plano Clark 2017; Oranga & Matere, 2023). Consequently, the combination of detailed, context-rich qualitative data with the objectivity of quantitative analysis helps researchers to present more balanced and nuanced conclusions (Bergman, 2008).

***Flexibility and Adaptability***

Mixed methods research offers flexibility by allowing researchers to choose the best combination of qualitative and quantitative methods suited to their specific research question. Researchers can use qualitative data to explore new areas or hypotheses and quantitative methods to test or confirm these insights (Halcomb & Hickman, 2015; Molina-Azorin, 2011). Moreover, researchers can adjust their approach as they collect data. For example, initial qualitative interviews might lead to the development of survey questions that better capture the relevant variables, or conversely, patterns found in quantitative data can prompt deeper qualitative exploration. This flexibility is particularly valuable in dynamic and complex research contexts, as it enables researchers to respond to new insights and refine their approach during the study process (Bryman, 2006).

Creswell and Plano Clark (2017) also contend that the Mixed methods approach provides flexibility by allowing researchers to adapt their design as the study progresses. Accordingly, researchers can begin with qualitative data to explore a phenomenon and then use quantitative methods to test emerging hypotheses or relationships.

***Enhanced Interpretation and Theory Development***

The combination of qualitative and quantitative data can facilitate a deeper interpretation of findings, which is essential for theory development. Mixed methods research is particularly effective in developing new theories or models by allowing researchers to integrate various perspectives and findings from both methodologies (Doyle, Brady & Byrne, 2016). Quantitative data may reveal broad trends, while qualitative data can provide the depth needed to explain why those trends exist. This complementary relationship enhances the potential for theory-building, as researchers are not limited to the strengths or weaknesses of a single methodological approach. Johnson, Onwuegbuzie, and Turner (2007) also contend that mixed methods research provides "a more complete understanding" of a phenomenon and can play a crucial role in theory generation and refinement.

***Improved Policy and Decision-Making***

Another significant advantage of mixed methods research is its potential to better inform policy and decision-making. The integration of qualitative insights with quantitative data provides policymakers with a more comprehensive understanding of the issues at hand (Bowers, Cohen & Elliot et al, 2013). For instance, in educational research, a mixed methods approach can provide both measurable outcomes of educational interventions and detailed insights into students' and teachers' experiences, enabling better decision-making regarding curriculum and instructional methods (Creswell & Plano Clark, 2017)

***Addressing Complex Research Questions:***

The mixed methods approach is especially useful for answering complex research questions that involve multiple dimensions of a phenomenon. For example, in health research, mixed methods can help understand both the statistical prevalence of a health issue (quantitative) and the personal experiences of individuals affected by it (qualitative) (Creswell & Plano Clark, 2017; Halcomb E & Hickman L, 2015).

***Limitations of the Mixed Methods Approach***

While the mixed methods approach offers many advantages as shown above, it is not without its drawbacks. The drawbacks are discussed in the subsequent sub-section:

***Complexity of Research Design and Implementation***

One of the primary disadvantages of mixed methods research is the complexity involved in designing and implementing the study. Since mixed methods research integrates two distinct research paradigms (qualitative and quantitative), researchers need to carefully plan how the methods will complement each other while addressing the research questions. This requires a clear understanding of both methodologies and the ability to integrate them meaningfully. The complexity of managing both qualitative and quantitative data often leads to difficulties in developing a coherent research design that integrates the different approaches effectively (Creswell & Plano Clark, 2017). Additionally, researchers may face challenges in determining the optimal timing and sequence for collecting and analyzing both types of data, which can complicate the study's execution and prolong the research process.

***Resource and Time Intensive***

Mixed methods research is often resource-intensive, requiring more time, funding, and effort than studies relying on a single research method. The need to collect and analyze both qualitative and quantitative data means that researchers must be proficient in both types of analysis and have access to the necessary resources, such as software

for data analysis, personnel, and expertise in both methodologies. According to Tashakkori and Teddlie (2010), the dual nature of the research approach can increase the logistical demands, particularly when it comes to data collection, transcription, coding, and analysis. Accordingly, this increased resource demand can be a barrier, especially for researchers with limited funding or time constraints. Bryman (2006) also contends that collecting and analyzing both qualitative and quantitative data can be time-consuming and resource-intensive.

#### ***Data Integration Difficulties***

One of the most significant challenges in mixed methods research lies in the integration of qualitative and quantitative data, as the research findings may not always align neatly or may produce conflicting results. Notably, qualitative data, often narrative and descriptive, are fundamentally different from quantitative data, which are numerical and statistical. The integration of both data sets, particularly when the two datasets are inconsistent or incompatible can present a challenge, requiring advanced analytical techniques (O'Cathain et al., 2010).

For instance, a quantitative survey might show a positive correlation between two variables, while qualitative interviews may reveal complex underlying reasons or nuances that contradict the statistical results (Schoonenboom, 2016). This disparity can lead to difficulties in interpreting the findings and creating a cohesive conclusion (Bryman, 2006). Hence, researchers need to carefully manage the integration process, which often requires advanced analytical skills in order to get clear results.

#### ***Difficulty in Balancing Both Methods***

Another limitation of mixed methods research is the challenge of balancing both qualitative and quantitative components within a single study. In some cases, one method may overshadow the other, which may lead to a less rigorous application of either approach (Schoonenboom, 2016). For example, if the quantitative component of the study is overly dominant, the qualitative data may be underutilized, limiting the depth of the research. Conversely, if the qualitative aspect takes precedence, the study may lack the statistical power or generalizability that quantitative research typically offers (Johnson, Onwuegbuzie, & Turner, 2007). Striking the right balance requires careful planning and thoughtful consideration of the research questions, objectives, and the relative importance of each method.

#### ***Challenges in Skillsets and Expertise***

Mixed methods research requires researchers to be skilled in both qualitative and quantitative methodologies, which can present a challenge for those who specialize in only one of these approaches (Morgan, 2018). Conducting both types of analysis effectively requires expertise in a wide range of skills, from statistical analysis and survey design to qualitative interviewing and thematic coding. As a result, researchers may need to collaborate with colleagues who have complementary expertise, which can lead to challenges in coordination and potential issues with consistency across the study (Tashakkori & Teddlie, 2010). Moreover, training researchers in both qualitative and quantitative methods can be time-consuming and costly, particularly for institutions that may not have the resources to offer comprehensive training in both areas. Hence, researchers must be skilled in both approaches, which requires extensive expertise and training.

#### ***Potential for Conflicting Results***

Another disadvantage of mixed methods research is the potential for conflicting or contradictory results. Qualitative and quantitative data often emerge from different assumptions, philosophies, and approaches. For instance, quantitative research may focus on measuring specific variables and identifying generalizable trends, whereas qualitative research may explore personal experiences and subjective meanings (Morgan, 2018). As a result, the findings from these two approaches may not always align. For example, a quantitative survey may show a high level of satisfaction among participants, while qualitative interviews reveal that individuals feel dissatisfied for complex, context-dependent reasons. The interpretation of such conflicting results can be challenging, and the research may risk producing inconclusive or misleading findings (Bryman, 2006). Consequently, this challenge requires careful consideration and a clear rationale for how to integrate the data (Ivankova et al., 2006).

#### ***Difficulty in Reporting Findings***

Reporting the findings of a mixed methods study can be difficult due to the need to communicate results from both qualitative and quantitative components. Accordingly, researchers may struggle to present the findings in a coherent and structured manner as the two types of data may need to be reported separately and then integrated. Moreover, there may be a risk of oversimplification when trying to fit complex qualitative insights into a standardized quantitative framework, or vice versa. As Creswell and Plano Clark (2017) point out, this complexity in reporting can lead to confusion for readers and may undermine the clarity and impact of the research findings.

#### ***Limited Standardization***

While the mixed methods approach has grown in popularity, there is still a lack of standardized guidelines for conducting and reporting mixed methods research. This can result in variability in the quality of studies and difficulties in comparing results across different fields or research contexts (Teddlie & Tashakkori, 2009).



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#### 4. CONCLUSION

Mixed methods research offers several compelling advantages, including a comprehensive understanding of the research problem, enhanced data triangulation, rich and contextualized data, flexibility in research design, and the potential for improved theory development and policy-making. Furthermore, the integration of both qualitative and quantitative approaches enables researchers to tap into the strengths of each method, providing a fuller, more nuanced understanding of complex research questions. However, as discussed, mixed methods research also presents with several challenges that include: the complexity of data integration, resource demands and difficulties in interpreting mixed data. Consequently, navigating the challenges requires careful planning, expertise in both qualitative and quantitative methodologies and clear strategies for integrating the data effectively. Noteworthy, as the field of mixed methods research continues to evolve, it remains a valuable tool for researchers across a wide range of disciplines.

#### 5. RECOMMENDATIONS

1. Researchers should receive training in both qualitative and quantitative research methods to ensure they have the necessary skills to conduct high-quality mixed methods studies.
2. The development of standardized protocols for conducting and reporting mixed methods research would enhance the consistency and quality of mixed methods studies. This includes clear guidelines for data integration and interpretation.
3. Researchers should leverage advanced software and tools that facilitate the integration and analysis of qualitative and quantitative data. This could help improve the efficiency and accuracy of mixed methods research.

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