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A CRITICAL REVIEW OF THE MIXED METHOD APPLICATION AND ITS CRITICISM

Abstract.

Purpose - This research paper aims to apply and criticize mixed methods research in different fields. Mixed methods research (MMR) has also faced criticism for its conceptual and methodological challenges. Therefore, this study will explore the research's criticism and strategies for overcoming them.

Methodology - Most of the current research works employ a mixed research methodology. Researchers use the mixed methodology to investigate challenging research questions that a single methodology cannot answer.

Findings - This research paper presents results related to using mixed methods research in various fields. Some critics argue that MMR lacks methodological rigor and can be time-consuming; others acknowledge its value in providing a more comprehensive understanding of complex social phenomena and marginalized communities. MMR has successfully employed to identify gaps in student knowledge, explore the interplay between psychological and physiological factors in health and illness, and develop more effective policies. However, balancing the depth of qualitative data with the breadth of quantitative data can be challenging, leading to compromises.

Practical implications - The findings of this research have important practical implications for researchers and practitioners across various fields. It can be beneficial, specifically in education, health psychology, and public policy.

Recommendations - Researchers should consider using mixed methods to examine complex research questions that require a multifaceted approach. Also, they should incorporate both quantitative and qualitative data to provide a more complete understanding of the research question. MMR can help capture diverse perspectives and experiences, particularly for underrepresented populations, providing a more nuanced understanding of social phenomena. These recommendations highlight the potential benefits of using mixed methods research and suggest directions for future research.

Keywords: Mixed Methods Research; Critiquing Mixed Methods Research; Qualitative Research; Quantitative Research.

INTRODUCTION

The mixed methods application research design integrates quantitative and qualitative research methods to deliver a more comprehensive understanding of a research problem (Leavy, 2022). It involves collecting and analyzing both numerical and non-numerical data to gain insights into a particular phenomenon or issue. Due to its capacity to present a more thorough and complicated picture of complex phenomena, this method has gained popularity recently, especially in the social sciences (Vivek & Nanthagopan, 2021).

The importance of mixed methods research is its capacity to overcome the drawbacks of utilizing a single research method (Sakata, 2022). While quantitative research can analyze numerical data, it frequently fails to provide the depth and context of qualitative research. However, while qualitative research shows an in-depth, rich understanding of a phenomenon, it may not be able to extrapolate its findings to a larger audience (Sakata, 2022). Mixed methods research combines the two approaches to understand a research problem better and increase the validity and reliability of results.

Mixed methods research is beneficial for researching complex and multidimensional areas where multiple perspectives are required to answer research questions adequately. In these situations, integrating qualitative and quantitative methods provides a comprehensive understanding of the research problem, as each method complements the other's limitations. For instance, qualitative research provides rich and in-depth data that helps to understand the social and cultural context in which the research problem occurs, while quantitative research provides numerical data that identify patterns and relationships within data (Vivek, 2022).

The mixed methods approach has been applied in various research fields, including health care, education, psychology, sociology, and business. In health care, mixed methods research has helped to understand the effectiveness of interventions, explore patients' experiences, and identify the factors that affect healthcare utilization (Anguera et al., 2018). In education, mixed methods research has examined the impact of educational programs and interventions, investigated the attitudes and perceptions of students, and evaluated teaching effectiveness (Vebrianto et al., 2020).

The works of Huang et al. (2019) on implementing technology in the classroom is a recent example of utilizing the mixed methods approach. The study used a combination of surveys, focus groups, and interviews to collect data from teachers and students to gain a thorough understanding of the advantages and challenges relating to the application of technology in education. The findings revealed that technology could enhance student engagement and learning but presents challenges, such as technical difficulties and distraction (Vivek & Nanthagopan, 2021).

The next example is the research of Zhang & Creswell (2013) on patient experiences with end-of-life care. The study used a mixed methods approach to gather two types of data (surveys) and qualitative data (interviews) from patients and their family members to obtain in-depth information about the advantages of patients' experiences. The findings revealed that patients valued communication with healthcare professionals and emotional and spiritual support in end-of-life care.

The importance of mixed methods research is proven by the numerous recent studies that have utilized this approach across various fields. Despite multiple

challenges associated with designing and implementing mixed methods studies, the benefits are clear, and researchers should consider using this approach in their work. Finally, the paper will provide recommendations for researchers who expect to use mixed methods research.

LITERATURE REVIEW

The literature review will explore the ethical issues related to mixed methods research and emphasize the significance of its transparency and objectivity. Additionally, this aims to provide a thorough understanding of how to apply mixed methods research.

In recent years, mixed methods research (MMR) has grown in popularity to combine the advantages of qualitative and quantitative research methods (Johnson & Onwuegbuzie, 2018). MMR has been defined as the research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration» (Creswell & Plano Clark, 2018).

Mixed methods research deals with research questions that the qualitative or quantitative approaches alone cannot address adequately; this is one of its benefits (Tashakkori & Teddlie, 2020). Another advantage is the potential for triangulation, where findings from one method can be corroborated by results from another method (Onwuegbuzie & Johnson, 2019). Additionally, MMR can help researchers to develop a more nuanced understanding of complex phenomena by incorporating multiple perspectives (Teddlie & Tashakkori, 2021).

However, the application of mixed methods research has not been without criticism. This literature review will examine some main criticisms of mixed methods research and explore potential solutions.

One criticism of mixed methods research is that it can be difficult to integrate qualitative and quantitative data, mainly if collected at different times or employed different methods (Creswell & Creswell, 2018). Another criticism is that mixed methods research can be time-consuming and resource-intensive, requiring a high level of expertise and coordination (Onwuegbuzie & Collins, 2018). Furthermore, some critics argue that combining qualitative and quantitative methods can lead to a loss of rigor, as researchers may prioritize breadth over depth or sacrifice the strengths of one method to accommodate the other (Bryman, 2021).

To address these criticisms, researchers have proposed many strategies. One approach uses a sequential design, where one method is used to inform the other (Creswell & Creswell, 2018). This can involve using qualitative data to develop quantitative measures or using quantitative data to identify key variables for further qualitative exploration. Another strategy is using a convergent design, where both qualitative and quantitative data are collected simultaneously and integrated during analysis (Onwuegbuzie & Collins, 2018). This approach requires careful attention to the comparability of the data and the development of appropriate analytical techniques.

Despite these criticisms, mixed methods research remains a valuable approach in many areas of social science research, particularly in studies that aim to explore

complex phenomena that cannot be adequately captured by a single method. With careful attention to design and analysis, mixed methods research can provide a rich and nuanced understanding of social phenomena.

In conclusion, quantitative and qualitative research methods have their strengths and limitations, and researchers must carefully consider which approach to use depending on the research question and the nature of the research topic. Quantitative research is valuable for producing objective and reliable numerical data; it can help to study the effectiveness of interventions and treatments. However, it may oversimplify complex phenomena and may not be suitable for studying subjective experiences or social phenomena that are difficult to measure through numerical data. In addition, qualitative research is valuable for gaining a deeper understanding of complex phenomena, exploring new research topics, and generating hypotheses for further investigation. However, the potential for subjective bias and limitations in generalizability should be carefully considered when designing a qualitative research study (Vivek & Nanthagopan, 2021).

METHODOLOGY

The objective of the mixed methodology is to leverage the strengths of these qualitative and quantitative methods while minimizing their limitations. Researchers use the mixed methodology to explore complex research questions that cannot be addressed using a single method. The mixed methodology approach has gained popularity in the social sciences because it enables researchers to answer research questions comprehensively.

The mixed methodology is applicable to various research contexts. For example, it facilitates healthcare research to investigate the effectiveness of a new treatment intervention. Researchers may use quantitative methods to collect data on the treatment's efficacy, such as measuring changes in a patient's vital signs while using qualitative methods to capture a patient's experiences and perceptions of the intervention (Riggio, Diefenbeck, & Ferrari, 2020).

In education research, the mixed methodology can investigate the impact of a new teaching approach on student learning. Researchers may use quantitative methods to collect data on students' test scores while they use qualitative methods to capture teachers' and students' perceptions of the new teaching approach (Egawa & Akita, 2021).

Mixed methods research designs have several different approaches to implementing mixed methods. Creswell and Plano Clark (2018) outlined five primary designs for mixed methods research: (1) sequential explanatory design, (2) sequential exploratory design, (3) convergent parallel design, (4) embedded design, and (5) transformative design.

The sequential explanatory design involves collecting and analyzing quantitative data first, followed by collecting and analyzing qualitative data in a second phase to help explain or expand the quantitative findings. The sequential exploratory design involves collecting and analyzing qualitative data, followed by collecting and analyzing quantitative data in a second phase to help test or validate the qualitative findings. The

convergent parallel design involves collecting and analyzing (both) qualitative and quantitative data simultaneously, with the results being compared and integrated into the final analysis. The embedded design consists of collecting and analyzing both qualitative and quantitative data, with one method being subservient to the other. Finally, the transformative design collects and analyzes qualitative and quantitative data to promote social change or address a particular societal issue.

Each of the five mixed methods research designs has its own set of advantages and disadvantages. The sequential explanatory design allows researchers to gain a deep understanding of a particular phenomenon by using qualitative data to help explain the results of quantitative data. It can be time-consuming and unsuitable for all research questions (Creswell & Plano Clark, 2018). The sequential exploratory design allows for flexibility in data collection and analysis, but it can be challenging to integrate the two sets of data (Sakata, 2022). The convergent parallel design allows for the triangulation of data and the ability to address multiple research questions, but it can be difficult to integrate the qualitative and quantitative data (Teddlie & Tashakkori, 2021). The embedded design allows for the strengths of both qualitative and quantitative data to be utilized, but balancing the two methods and maintaining the research integrity may be difficult (Creswell & Plano Clark, 2018). Finally, the transformative design allows for integrating research and social action, but its implementation may require additional resources (Sakata, 2022).

This report also mentions the overall advantages and disadvantages of mixed methods application. One of the primary advantages of mixed methods research is that it allows researchers to collect and analyze both qualitative and quantitative data in a single study. It provides a more comprehensive understanding of the research problem (Creswell & Plano Clark, 2018). Additionally, mixed methods research can increase the research findings' validity and reliability since using multiple methods can help to triangulate data and improve the findings' robustness (Creswell & Plano Clark, 2018).

Mixed methods research can help to overcome the limitations of both qualitative and quantitative research methods, such as the lack of generalizability of qualitative research and the inability of quantitative research to capture the complexity of human behavior and experience (O'Cathain, Murphy, & Nicholl, 2018). Mixed methods research can provide a more comprehensive and robust understanding of research problems.

The mixed methods research has some disadvantages. A main challenge of mixed methods research is the complexity of design, data collection, and analysis, which demands high expertise levels and resources (O'Cathain, Murphy, & Nicholl, 2018). Additionally, mixed methods research can be time-consuming and costly, which may limit its feasibility in specific contexts (Riggio, Diefenbeck, & Ferrari, 2020; Teddlie & Tashakkori, 2021). Further, mixed methods research requires careful attention to integrating qualitative and quantitative data, which can be challenging to achieve, particularly when researchers have different philosophical and methodological perspectives (Creswell & Plano Clark, 2018). Finally, mixed methods research may encounter challenges related to result publication. Some journals may not accept mixed methods research or require researchers to prioritize qualitative or quantitative data over the other (O'Cathain, Murphy, & Nicholl, 2018).

In conclusion, MMR can increase the validity and reliability of research findings and overcome the limitations of traditional research methods. Nevertheless, mixed methods research can be challenging due to its complexity, time-consuming nature, and need for careful data integration. Therefore, while mixed methods research has its advantages, it is essential for researchers to carefully consider its limitations and challenges before deciding to use this approach (Vivek & Nanthagopan, 2021).

APPLICATIONS OF MIXED METHODS RESEARCH

This approach has several applications in various fields, including healthcare, education, and the social sciences. One of the most common applications of mixed methods research is in healthcare research. Researchers use mixed methods research to investigate healthcare interventions and their impact on patient outcomes. For instance, a recent study by Kim et al. (2020) used a mixed methods approach to examine the implementation of a new telemedicine system for managing diabetes patients. The study used quantitative methods to collect data on patient outcomes and clinical measures and employed qualitative methods to gather data on patient and provider experiences with the telemedicine system.

In education research, mixed methods research can investigate the effectiveness of new teaching methods or interventions. For instance, a study by Salloum, Burchinal, and Jablon (2019) used mixed methods to examine the impact of a literacy program on young children's reading abilities. The study used quantitative measures (such as standardized tests) and qualitative measures (such as interviews with parents and teachers) to evaluate the program's effectiveness.

Mixed methods research is also valuable for social science research, particularly in exploring complex social phenomena. For instance, a study by Holst and colleagues (Holst, Nissen, & Nielsen, 2019) used a mixed methods approach to investigate the experiences of transgender and gender nonconforming individuals with healthcare. The study used a combination of quantitative surveys and qualitative interviews to explore the experiences of these individuals with healthcare providers and the healthcare system.

Mixed methods research is also applicable in program evaluation. For instance, McEwan Creighton, and Olafson (2020) used mixed methods to evaluate a school-based program aimed at reducing bullying. The study used quantitative measures such as surveys, and qualitative measures such as focus groups, to evaluate the program's impact on bullying behaviors and student attitudes toward bullying.

In conclusion, mixed methods research has several applications in healthcare, education, the social sciences, and program evaluation. Researchers can gather comprehensive data on complex research questions and triangulate their findings by integrating both quantitative and qualitative methods. The cited recent research articles demonstrate the versatility and effectiveness of mixed methods research in addressing various research questions in different fields.

CRITICISMS OF MIXED METHODS RESEARCH

This research approach aims to contribute a more comprehensive understanding of a research circumstance by gathering and analyzing both numerical and non-numerical data. However, some scholars have criticized it for various reasons.

One of the major criticisms of mixed methods research is the difficulty of effectively combining qualitative and quantitative data. Some researchers argue that this can result in superficial data analysis or even contradicting findings. For example, Creswell and Plano Clark (2018) stated that «the integration of qualitative and quantitative data in mixed methods research can be difficult, and it requires a high level of expertise to conduct it properly. It is argued that mixed methods research can be time-consuming, limiting its feasibility for particular research questions.

Another criticism is that it can be challenging to ensure that both qualitative and quantitative data are equally important. Some researchers suggest that MMR can result in prioritizing one type of data over the other. For example, O’Cathain, Murphy, and Nicholl (2018) argued that «the integration of qualitative and quantitative data in mixed methods research is often asymmetrical, with one type of data being used to support or explain the other». This can result in biased data interpretation or a misunderstanding of the research phenomenon.

Some scholars argue that mixed methods research can lack theoretical coherence. For example, Bazeley (2018) suggested that «mixed methods research can result in an overly descriptive analysis, without a clear theoretical framework to guide the research». This can result in a lack of understanding of the research phenomenon and limit the generalizability of the findings.

However, MMR is criticized. Scholars have raised concerns about integrating qualitative and quantitative data, the prioritization of one type of data over the other, and lacking theoretical coherence in MMR. Researchers using mixed methods research should be aware of these criticisms and strive to address them in their research designs.

STRATEGIES FOR CRITIQUING MIXED METHODS RESEARCH

Critiquing mixed methods research is an essential skill for researchers to evaluate the quality of research designs and findings. Given the complexity of MMR, a comprehensive critique requires a nuanced understanding of the methodology and its application. Several strategies can be used to critique MMR effectively.

The first strategy for critiquing mixed methods research is to assess the appropriateness of the research design. This includes evaluating the research question, the research objective, the sampling method, and the data collection and analysis techniques used. Johnson and Onwuegbuzie (2018) state, «The appropriateness of the research design is critical to the success of mixed methods research». An inappropriate research design can lead to biased or inaccurate results.

The second strategy is to evaluate the combination of both approaches’ data. This includes assessing the data coherence, the timing of data collection, and the level of integration achieved. Hesse-Biber (2018) argued that «the integration of qualitative and quantitative data is at the heart of mixed methods research». Evaluating the quality of integration can help determine the research findings’ validity.

The third strategy is to examine the quality of data collection and analysis. This involves evaluating the reliability and validity of the data, the accuracy of the data analysis techniques used, and the rigor of the study process. According to Ivankova, Creswell, and Stick (2018), «The quality of data collection and analysis is essential for ensuring the credibility of mixed methods research». Ensuring the data collection and analysis status can help reduce the risk of biased or inaccurate findings.

The fourth strategy is to evaluate the results and limitations of the research. This includes assessing the research contribution to the field, the generalizability of the findings, and the potential biases or limitations of the research design. Sandelowski, Voils, and Knafl (2018) argued that «an evaluation of the strengths and limitations of the research is essential for determining the value of mixed methods research». Understanding the research results and limitations can help researchers to determine the findings' practical implications.

In conclusion, critiquing mixed methods research requires a nuanced comprehension of the research design, the integration of qualitative and quantitative data, the quality of data collection and analysis, and the strengths and limitations of the research. Researchers should use these strategies to assess the status of mixed-methods research and make informed decisions about the value of the research findings.

FINDINGS

The findings presented in this research paper related to the study are as follows:

The use of MMR in health science is increasing, with a growing interest in integrating qualitative and quantitative data for a more comprehensive understanding of health phenomena (Johnson, Onwuegbuzie, & Turner, 2018). Critics of mixed methods research argue that it lacks methodological rigor and that combining different approaches may lead to inconsistencies in the data (Mertens, 2019). MMR is particularly useful for studying complex social phenomena, such as social inequality and power relations, by providing a nuanced understanding of the multiple dimensions of these phenomena (Creswell & Plano Clark, 2018).

Some researchers have criticized mixed methods research for being too focused on the collection and analysis of data rather than on the interpretation and synthesis of findings (Bazeley, 2018). MMR has been used successfully in educational research to identify gaps in student knowledge and develop more effective teaching methods (Creswell & Clark, 2020).

Critics of mixed methods research have also argued that it may not be suitable for all research questions and could be difficult to combine qualitative and quantitative data meaningfully (Teddlie, Tashakkori, & Yu, 2018). MMR is particularly useful in health psychology, which explores the complex interplay between psychological and physiological factors in health and illness (Johnson & Onwuegbuzie, 2019).

Some researchers have criticized mixed methods research for being too time-consuming and resource-intensive, particularly regarding data collection and analysis (Creswell & Creswell, 2018). MMR has been successfully used in public policy to explore the impact of policy interventions on different groups of people and to develop more effective policies sensitive to the needs of marginalized communities (Bryman, 2021). Critics of mixed methods research have also argued that it may not be suitable

for research that requires a high degree of precision or that involves large amounts of quantitative data (Teddlie & Tashakkori, 2019).

The use of MMR has increased in the education field to identify the effectiveness of teaching practices and explore student experiences and perspectives (Teddlie & Tashakkori, 2019). MMR can help explore the experiences and perspectives of marginalized communities, providing a more nuanced understanding of their lived experiences (Morgan & Yoder, 2019). Critics of MMR argue that it can be difficult to balance the depth of qualitative data with the breadth of quantitative data, leading to compromises (Greene, Caracelli, & Graham, 2018).

RECOMMENDATIONS

Mixed methods research has emerged as a valuable approach for conducting more comprehensive, inclusive, and rigorous research. Below are some recommendations for applying mixed methods in research.

Use mixed methods to examine complex research questions: Examining complicated research questions that need a multifaceted approach is a good fit for mixed methods research.

Incorporate both quantitative and qualitative data: One of the key strengths of mixed methods research is the ability to combine quantitative and qualitative data to provide a complete picture of the research question.

Use mixed methods to validate findings: MMR can be useful for validating the results obtained from a single method.

Utilize mixed methods to capture diverse perspectives: MMR can capture diverse perspectives and experiences, particularly for underrepresented populations.

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КРИТИЧНИЙ ОГЛЯД ЗАСТОСУВАННЯ ЗМІШАНОГО МЕТОДУ ДОСЛІДЖЕННЯ ТА ЙОГО КРИТИКА

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Анотація.

Мета - ця дослідницька стаття спрямована на аналіз застосування змішаних методів дослідження в різних галузях. Застосування змішаних методів (MMR) також зіткнулося з критикою через свої концептуальні та методологічні проблеми. Тому в цьому дослідженні проаналізовано критичні підходи до розуміння і застосування цього методу та стратегії їх подолання.

Методологія - більшість поточних дослідницьких робіт використовують змішану методологію дослідження. Дослідники використовують змішану методологію для дослідження складних дослідницьких питань, на які не може відповісти одна методологія.

Висновки – ця стаття висвітлює результати, пов'язані з використанням змішаних методів дослідження в різних областях. Деякі критики стверджують, що MMR бракує методологічної строгості та може займати багато часу; інші визнають його цінність у забезпеченні більш повного розуміння складних соціальних явищ і маргіналізованих спільнот. MMR успішно використовується для виявлення прогалин у знаннях студентів, вивчення взаємодії між психологічними та фізіологічними факторами здоров'я та хвороби та розробки більш ефективної політики. Однак збалансувати глибину якісних даних із широтою кількісних даних може бути складно, що призведе до компромісів.

Практичні наслідки - висновки цього дослідження мають важливі практичні наслідки для дослідників і практиків у різних галузях. Це може бути корисним, зокрема, в освіті, психології здоров'я та державній політиці.

Рекомендації - дослідникам слід розглянути можливість використання змішаних методів для вивчення складних дослідницьких питань, які потребують багатогранного підходу. Крім того, вони повинні включати як кількісні, так і якісні дані, щоб забезпечити більш повне розуміння питання дослідження. MMR може допомогти охопити різноманітні точки зору та досвід, особливо для недостатньо представлених груп населення, забезпечуючи більш детальне розуміння соціальних явищ. Ці рекомендації підкреслюють потенційні переваги використання MMR та пропонують напрямки майбутніх досліджень.

Ключові слова: дослідження змішаних методів; критика дослідження змішаних методів; якісне дослідження; кількісне дослідження.

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