

Challenges in Implementing Methodological Triangulation in Mix-Method Research

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Abstract

Initially rooted in navigation, triangulation refers to determining an object's position from multiple reference points, as in maritime navigation. In research, this concept has been adapted to integrate diverse theoretical or methodological perspectives, providing multiple interpretations of a single research problem. This approach enables researchers to construct varied perspectives, enriching depth, credibility, and validity of findings. Scholars define triangulation as the application of multiple approaches to examine a single issue. This paper will provide various perspectives of methodological triangulation to the graduate students, particularly those in the early stages of their academic careers. It explores its historical evolution, conceptual foundations, primary classifications, and the practical applications of methodological triangulation. Additionally, it identifies the challenges associated with methodological triangulation and presents strategies to help young researchers effectively integrate the triangulation approach, thereby enhancing the quality of their mixed-method research. Furthermore, the findings of methodological triangulation are critically analyzed and discussed through selected examples from health and social sciences research (Mousazadeh et al., 2019; Egerod et al., 2020; Raymond et al., 2018), demonstrating its real-world relevance and guiding students in applying rigorous, multidimensional approaches to complex research problems.

Keywords: Mixed-Method Research, Graduate Students, Application of Triangulation.

Introduction

Triangulation, derived initially from navigation, involves determining an object's position from multiple angles, as with a ship. Research extends this concept by incorporating different theoretical or methodological approaches, offering various viewpoints or interpretations to deal with the same research issue. This method constructs multiple vantage points to enhance understanding of a research problem. As defined by different scholars, triangulation involves employing diverse approaches to examine a singular subject. Denzin (1970) emphasizes the fusion of multiple methods, theories, and data sources for scrutinizing a particular phenomenon. Cowman stresses the integration of varied methods in investigating the same object or event, ultimately enhancing the depth of research inquiry (Cowman, 1993). In essence, these perceptions collectively affirm the value of triangulation in fostering a holistic and enriched research process, thereby reinforcing the importance of methodological diversity in advancing scholarly investigations. In addition,

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Moon (2019) emphasizes that the triangulation augments the rigor and trustworthiness of research outcomes, encompassing facets of credibility, dependability, confirmability, and transferability. This method contributes to heightened validity, reliability, and legitimacy levels in the research endeavor.

Researchers have identified the five types of triangulation, namely theory triangulation, data triangulation, investigator triangulation, multiple triangulation, and methodological triangulation (Chasr, 2018). In addition, Research triangulation is a process that is employed to augment the validity and reliability of study findings (Noble & Heale, 2019). It may encompass the deployment of diverse methodologies to ascertain the credibility of research; nevertheless, it stands apart from mixed methods. Mixed methods involve combining quantitative and qualitative research methodologies to address research questions. In contrast, triangulation pertains to the researcher's utilization of multiple approaches within the study to extract crucial data and rigorously scrutinize the research outcomes (Chasr, 2018).

This paper aimed to support a thorough comprehension of methodological triangulation for graduate students who are in the early stages of their academic pursuits. It seeks to elucidate its historical development and conceptual underpinnings. Moreover, it delineates the fundamental classifications of methodological triangulation. In addition, this paper aspires to identify the challenges and strategies that will aid young scholars in proficiently assimilating the methodological triangulation to augment the quality of their mixed-method research journey.

Historical Perspective

Methodological triangulation in research has seen a progressive evolution over time. Emerging in the second half of the 20th century, Donald Campbell, a quantitative psychological methodologist who was the first author, introduced the triangulation concepts (Campbell & Fiske, 1959). Then, in the 1970s and 1980s, Norman Denzin, a qualitative social scholar, realized the concept of triangulation by differentiating it into various forms, including multiple, investigator, data, theory, and methodological triangulation (Denzin, 1970). He emphasized the importance of considering the specific social context in which data is produced when conducting research. He also believes that valid results converge or align across different approaches or techniques. This was the first phase of the triangulation. In the subsequent phase, during the 1990s, scholars such as Bryman and Teddlie extended the conceptual framework of triangulation, advancing the understanding and application of methodological triangulation, particularly in the context of mixed methods research (Bryman, 1992). The evolution of data analysis methodologies and software in the period spanning from the 2000s to the contemporary era has witnessed a notable surge in the combination of qualitative and quantitative data, allowing a more holistic comprehension of research inquiries. Present-day mixed methods research underscores the importance of transparency in elucidating findings and reflexivity in the research process, acknowledging the pragmatic considerations inherent in the selection and integration of diverse methods (Creswell & Plano Clark, 2017). This historical trajectory signifies a continuing dedication to refining the integration of varied research approaches, culminating in a more nuanced framework for designing and executing studies that adeptly harness the strengths inherent in both quantitative and qualitative methodologies.

Methodological triangulation means to utilize more than one data source or method in a single study, and it can be divided into two types: "within method" or "across method" (Risjord et al., 2001; Casey & Murphy, 2009). Methodological triangulation "within method" is the amalgamation of two or more data collection methods found within one qualitative or quantitative study design to examine the same phenomena under study. To further explain this concept, we can appreciate

the nursing research case, which provides a context and a better understanding of how it has been used in the research.

Exploring ICU Nurses’ Job Satisfaction: A Qualitative Insight

Mousazadeh et al. (2019) conducted research titled "Job Satisfaction Challenges of Nurses in the Intensive Care Unit: A Qualitative Descriptive Exploratory Study," published in the Journal of Risk Management and Healthcare Policy. This study exemplifies a rigorous application of various methods and data sources within the qualitative study, enabling a comprehensive and nuanced comprehension of the phenomena under investigation. The researchers thoughtfully employed various methods, namely observations, focus group interviews, and in-depth semi-structured interviews, to delve into the facets of job satisfaction and its associated challenges experienced by intensive care unit nurses in Iranian healthcare settings.

Table 1: Summary of Methodological Triangulation "within method" in Qualitative Study

Design	Data Collection Techniques	Analysis	Purpose/Goal
Qualitative Descriptive exploratory	In-Depth Semi-Structured Interviews	Content Analysis	Explore participants' perspectives, experiences, and beliefs about Job satisfaction and its challenges. Provide an in-depth qualitative understanding.
	Focus Group Interviews	Content Analysis	Nurses who agreed to participate in a group discussion are likely to engage in the dialogue regarding factors of Job satisfaction
	Observation	Field notes	Gain insights into the contextual factors influencing Job satisfaction among nurses

Triangulated Review and Survey Data in Nordic Critical Care Research:

Egerod et al. (2020) conducted a scholarly investigation titled "Trends and Recommendations for Critical Care Nursing Research in the Nordic Countries: Triangulation of Review and Survey Data," published in the Journal of Intensive and Critical Care. This study employed a descriptive comparative study design, strategically triangulating the data source from two distinct channels: a retrospective literature review and a cross-sectional survey administered to active nurses working in critical care areas of the Nordic Association for Intensive Care Nursing Research. The literature review employed manifest content analysis to categorize and scrutinize publication titles systematically, discerning research domains pertinent to the nurse, family, patient, and therapeutic interventions. This exemplary study is distinguished by its proficient utilization of a retrospective literature review and a forward-looking survey methodology. It enables a comprehensive examination of prevailing trends and offers valuable recommendations for the future trajectory of critical care nursing research in the Nordic countries.

Table 2: Summary of Methodological Triangulation "within method" in Quantitative Study

Design	Data Collection Techniques	Analysis	Purpose/Goal
Quantitative Descriptive Comparative	Retrospective review of the past issues from the years 2016 and 2017 of the journals "Intensive and Critical Care Nursing" (published by Elsevier) and "Nursing in Critical Care" (published by Wiley).	Content Analysis	The choice of these journals was deliberate, aiming to pinpoint studies led by critical care nurses to extract insights of particular relevance to the nursing profession. To represent the contemporary areas in critical care nursing research. To gather data from published studies to gain insights into the current trends and priorities in critical care nursing research
	Prospective Survey/Cross-Sectional Survey	Descriptive Statistics	To gather data directly from nurses working in critical care area researchers in the Nordic countries. The survey provided a comprehensive overview of the current state of critical care nursing area research

Single-Phase Triangulation in Educational Nursing Research

Raymond et al. (2018) undertook a single-phase triangulation study titled "Nurse Educators' Critical Thinking: A Mixed Methods Exploration," published in the Nurse Education Today Journal. The researchers adopted a single-phase triangulation mixed methods design, aligning with the framework proposed by Creswell and Plano Clark (2017). This study serves as an exemplar of methodological triangulation across various research methods. Notably, the intricate nature of critical thinking within the nursing domain was effectively elucidated through the prudent application of multiple research methodologies. The triangulation approach encompassed the concurrent utilization of a demographic survey, two critical thinking self-assessment instruments, participant observation, and semi-structured interviews. The ensuing table visually represents how this selected design integrated diverse data collection techniques to scrutinize critical thinking in nursing education comprehensively.

Table 3: Summary of Methodological Triangulation across method used in the Quan-Quali Study

Design	Data Collection Techniques	Analysis	Purpose/Goal
Quantitative single-phase triangulation mixed methods	Demographic Survey	Descriptive statistics	Gather background information about participants Provide context for understanding critical thinking in nursing education
	Self-Assessment Tool (Two)	Descriptive Statistics and	Assess participants' self-perceived critical thinking abilities

		Inferential Statistics	
Qualitative	Participant Observation	Field Notes	Observe and document natural behaviors and interactions related to critical thinking in nursing education. Gain insights into the contextual factors influencing critical thinking.
	Semi-Structured Interviews	Thematic Analysis	Explore participants' perspectives, experiences, and beliefs about critical thinking in nursing education. Provide an in-depth qualitative understanding of critical thinking processes.

Discussion

After examining the aforementioned instances of methodological triangulation, my understanding of its application has significantly enhanced. However, a query pertains to the underlying importance of employing methodological triangulation within the realm of nursing. Does its prominence stem from contemporary trends or degree requisites, or are there deeper rationales that warrant consideration? It is posited that the nursing domain is inherently complex and characterized by a web of interconnected factors. Consequently, nursing researchers require methodologies capable of capturing this complexity and multidimensionality inherent in practical nursing knowledge (Foss & Ellefsen, 2002). This highlights the potential of methodological triangulation to examine a given construct from diverse vantage points, owing to its combination of different research approaches.

Regarding the abovementioned example of methodological triangulation "across method," that employs a single-phase triangulation, mixed-method research approach. I seek clarification on whether the methodological triangulation "across methods" constitutes a true mixed-method design or if it represents a distinct approach altogether. By reviewing different literature, I found that methodological triangulation "across methods" can be a component of a mixed-method design or one of the techniques that can be used within a mixed-method design (Fusch et al., 2018). To further clarify this concept, in contemporary research, mixed methods research (MMR) is currently experiencing a notable ascent within the nursing profession. However, a critical perspective asserts that qualitative and quantitative methodologies are grounded in discrete philosophical assumptions based on (ontology, epistemology, and axiology). This view point affirms that these methodologies and their ensuing outcomes ought to maintain their autonomy. However, developing the comprehensive typology of mixed-methods designs has proven challenging, with multiple classifications proposed in the literature (Kelle et al., 2019). Which means it follows the structured framework for organizing and understanding how researchers can integrate quantitative and qualitative methods in their studies. Mixed Method Research has various designs (concurrent, explanatory, exploratory, transformative, and multi-phase) with its characteristics, strengths, and potential applications (Creswell & Plano Clark, 2017). In contrast, methodological triangulation predominantly augments the depth, breadth, and comprehensiveness of research findings by combining multiple approaches, provide valuable abductive insights into the research phenomena (Arias Valencia, 2022).

Another query regarding methodological triangulation, is that the integration of qualitative and quantitative methods can mitigate bias in the "across method" triangulation approach? Proponents of methodological triangulation advocate for its proficiency in addressing potential sources of bias inherent in qualitative and quantitative research paradigms. While each methodology possesses its unique susceptibility to bias, integrating both enables researchers to discern and rectify these biases more effectively. Consequently, this practice engenders heightened confidence in the robustness of the study outcomes. Moreover, the deliberate engagement with methodological triangulation illuminates any disparities between qualitative and quantitative findings, facilitating a refined research approach. This refinement, in turn, culminates in an augmented validity of the results, a critical aspiration within the realm of nursing research (Arias Valencia, 2022).

Challenges and Strategic Approaches in Applying Methodological Triangulation:

Concerning the application of methodological triangulation, there are various challenges that young scholars encounter. For that, it is necessary to look for plausible strategies when applying methodological triangulation, recognizing its enriching and illuminating impact on research insights (Noble & Heale, 2019).

- Despite acknowledging the advantages of employing methodological triangulation, researchers tended to overlook the inherent differences among the chosen methods. Therefore, researchers need to be mindful and remain conscious while choosing different methods and triangulating them.
- There could also arise situations, where comparing findings from two sources yields inconsistencies or conflicts. Then, the researcher needs to plan and think in the initial phases of the research to see the strengths and weaknesses of each method used. Moreover, continuous evaluation needs to be done during the data collection process.
- Methodological triangulation introduces complexity because of the use of multiple methods in one research and extends the time investment in the research process. Young scholars should take caution against a haphazard approach to methodological triangulation. They ought to stress the importance of employing various methods and incorporating measures to control for biases in their studies. Failing to do so can lead to an overwhelming volume of data that is challenging to analyze effectively and may result in superficial or potentially flawed conclusions. Moreover, young scholars need to build the experience team of researchers who can provide guidance at each stage of the research process.
- When employing the research methodologies, achieving uniformity or consistency in triangulation may be challenging. According to Cowman's exposition of Mitchell's framework, four fundamental principles hold the potential for ensuring consistency in mixed-methods research. Firstly, a well-defined research question is essential. Secondly, the selected data collection methods should be chosen so that their strengths and weaknesses complement one another. Thirdly, the selection of methods should align with the nature of the investigation. Lastly, ongoing evaluation throughout the research process is crucial to ascertain adherence to the preceding three principles (Mitchell, 1986).
- Researchers might need to sufficiently explicate their strategies for integrating the research findings. Young Scholars should start by clearly defining their integration strategies from the study's proposal. This involves specifying how data from various methods will be combined and addressing potential contradictions. Establishing a conceptual framework guides the synthesis process, providing a structured approach to relate findings from different methods. In addition, Regular collaborative discussions within the research team facilitate richer

insights and more robust integration. Finally, transparent reporting in the final research output, detailing the steps taken and criteria applied, ensures transparency and rigor in integrating findings.

Conclusion

Methodological triangulation is a significant tool in providing a nuanced understanding of complex research phenomena. This paper has shed light on the evolutionary trajectory of this approach and its application in research through various nursing care examples. Additionally, we have gleaned valuable insights from the literature regarding the challenges that may arise when employing this method, along with corresponding strategies to surmount them. Echoing the wisdom of the renowned Greek philosopher Socrates, who praised the virtues of questioning, critical thinking, and reasoned inquiry in scholarly pursuits, the contemporary young scholar is expected to heed these principles. Moreover, we must acknowledge and appreciate the influential contributions of predecessors who have labored toward effecting constructive change in the realm of methodological triangulation. Engaging in cutting-edge research on this subject not only serves as a cornerstone but also makes a substantial contribution to the rapidly increasing body of knowledge within the domain of nursing.

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