

Improving the Validity of Mixed and Multi-Methods Through Triangulation in Sports Management Research

Received: 2023-03-24

Accepted: 2023-05-08

Vol. 4, No.2. Spring.2023, 16-27

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Abstract

Purpose: With the increasing growth of scientific research in sport management, the use of research methods and statistical software has become obvious. This research aims to improve the validity of mixed and multi-methods through triangulation in sports management research.

Methods: In terms of the research design, the current research is a new method of research combining several quantitative and qualitative methods and developing tools in mixed and multi-methods, and triangulation and, is evaluation research in terms of practical purpose and orientation.

Results: Usually, mixed methods are used to identify the underlying categories of the studied phenomenon, then, in the quantitative phase, a pattern is designed based on the identified categories. Multimethod research is an attempt to combine research methods to address a particular research problem. Multi-methods promise new insights and perspectives in the understanding of phenomena in sports management research. In the mixed method, to a certain extent, the limitation of the selection is proposed methodologically; A limitation that is somewhat seen with multi-methods. Not only does triangulation have no such limitation, but it is broader than the two cases mentioned as it acts as a tool kit for researchers to help understand and explain the subject under study.

Conclusion: Therefore, from this point of view, triangulation is more comprehensive than the two methods mentioned, and in the period of late modernity and postmodernity, which emphasizes the new pragmatism, triangulation seems to have a wide range of applications. In other words, maximum use of all types of data and documents, both theoretical and experimental; Quantitative and qualitative and things like that have made triangulation occupy a privileged position in understanding the subjects studied and expanding the body of knowledge in the studied field. This article will help researchers to choose a suitable scientific research method and start their research project.

Keywords: Methodology, Mixed and Multi-Methods, Sports Management, Triangulation.

Introduction

In the last years, there have been many discussions about increasing diversity, methodology, and complementary research methods, which have led to the integration of quantitative (QUAN) and qualitative (QUAL) research (Morgan, 1998). The method that today is called mixed methodology. Various researchers advocate the use of multiple methodologies to obtain deeper and more reliable perspectives on a topic (Boudreau et al., 2001; Kaplan & Duchon, 1988; Palvia et al., 2004). Different methods of data collection are also needed to determine the extent to which instrumentation affects research outcomes (Straub et al., 2004). It is very important to choose appropriate and accurate criteria to measure and measure the ease of use in each of the statistical methods (Lewis, 2018). Mixed methods are mentioned as the third movement of research methodology (Gorard & Taylor, 2004), which emerged in response to the limitations of using each of the QUAN and QUAL research methods alone (Tashakkori et al., 1998). This method has now become a common option and has been accepted by many researchers (Alavi & Håbek, 2016)

The mixed method research uses QUAN and QUAL methods in a single or multiphased study (Tashakkori et al., 1998) at all or many research stages (Creswell, 2009) including sampling strategies, data collection & analysis, findings synthesis, and integration & reporting. The data collected, analyzed, and synthesized can be numerical, but also textual/visual/multimedia data. "Mixed method is a term that is usually used to designate combining QUAN and QUAL research methods in the same research project. Writers prefer the term multimethod research to indicate that different styles of research may be combined in the same research project. These should not be limited to QUAN and QUAL. But it may include, for example, QUAL participant observation with in-depth qualitative interviews. Alternatively, it could include quantitative

survey research with quantitative experimental research. And of course, it would include QUAN with QUAL styles" (Johnson et al., 2007). Nevertheless, there are still challenges regarding the integration of QUAN and QUAL research methods, and the need for a suitable framework for designing and interpreting mixed studies is felt.

Multi-methods are mentioned as the fourth movement of research methodology. A multi-methods design is when two or more research projects, each complete on its own, are conducted to address research questions and/or hypotheses, a topic, or a program (Morse, 2003). As with mixed methods, studies may be a combination of quantitative methods, qualitative methods, or both. They used what they call the qualitative multimethod. This method uses interviews, observation, and audio recordings to collect and analyze more QUAL data in conjunction with limited QUAN data to support the interpretation of the findings by analyzing patterns and characteristics (Guetterman et al., 2015). Mingers and Brocklesby also talk about several applications such as, multimethod (more than one methodology is applied), and multimethod (more than one paradigm is applied) (Mingers & Brocklesby, 1997). Various methods may be utilized or combined in social scientific research; however, these depend on how the researcher combines, deploys, and implements them. According to (Hesse-Biber et al., 2015), multi-method research is the kind of study where the researcher utilizes more than one method or style that is not the same, to conduct the same study.

Triangulation is a powerful research technique that facilitates cross-validation using more than two sources. It especially refers to the application and combination of several research methods in the study of a phenomenon (Bogdan & Biklen, 2006). When you use methodological triangulation, you use different methods to approach the same research question. This is the most common type of triangulation, and

researchers often combine qualitative and quantitative research methods in a single study. Methodological triangulation is useful because you avoid the flaws and research bias that come with reliance on a single research technique (Bhandari, 2022). By combining multiple observers, theories, methods, and empirical data, researchers aim to overcome weaknesses, internal biases, and problems often found in single-method, single-observer, single-theory studies (Carugi, 2016). If previous studies cannot answer the research questions, triangulation will be the best option (Suharyanti et al., 2017). Triangulation in all types of research includes the following: A- Qualitative research: You conduct in-depth interviews with different groups of stakeholders, such as parents, teachers, and children. B-Quantitative research: You run an eye-tracking experiment and involve three researchers in analyzing the data. C- Mixed methods research: you conduct a quantitative survey, followed by a few (qualitative) structured interviews (Bhandari, 2023). Triangulation means researching a specific question from different sources and with different methods. For example, we want to see if the senior managers of a sports company, when they learned about the fire in the company's warehouse, denied this phenomenon or took it seriously. Triangulation means doing this by interviewing senior managers as well as middle managers and people who were with senior managers. Also, instead of using only the interview method, we should consider other methods such as studying documents. In simpler words, get our findings from different channels so that we can better judge whether the obtained findings are correct or not.

Triangulation, Mixed-methods, and multimethod research methodologists and researchers remain somewhat of an outsider minority in many organizational settings, while the quantitative and qualitative traditions continue largely as usual. Hence, stronger institutionalization of mixed-methods and multimethod research perspectives remains a

major goal for future development (Knappertsbusch et al., 2021). But the area of mixed and multi-methods is as debated as the research methods themselves and this is mainly because academics and researchers have different understandings of what is meant by this type of research project and what are the main types of mixed method designs. Because hybrid research methods are in the early stages of their evolution and hybrid research has been widely accepted in most fields, many researchers may still be confused about choosing a suitable hybrid research plan. By enhancing the strengths and reducing the limitations and weaknesses of mixed research approaches, sports management researchers can solve complex sports sciences problems creatively and thoughtfully. Therefore, in this research, we address this issue: How is improving the validity of mixed and multi-methods through triangulation in sports management research?

Materials and Methods

In the last 25 years, there have been many discussions about increasing diversity, methodology, and complementary research methods, which have led to the integration of quantitative and qualitative research. The method that today is called mixed and multi-methods, and triangulation. In terms of the research design, the current research is a new method of research combining several quantitative and qualitative methods and developing tools in mixed and multi-methods, and triangulation. The current research is an evaluation of new management methods in terms of practical purpose and orientation. Mixed research methods are mentioned as the third movement of research methodology, which emerged in response to the limitations of using each of the quantitative and qualitative research methods alone. This method has now become a common option and has been accepted by many researchers. Over time, mixed research methods have evolved and become independent methods. Its popularity and acceptance in the Humanities,

and even management are increasing. At the same time, with the increasing popularity of researchers in mixed and multi-methods, and triangulation, the proponents of the new research of sports management have made statements in defense and the importance of mixed research, which has increased the acceptability of this approach. The dominant aspects of experience and rationality may be different in each research. The author claims that all research can be divided into two parts, experimental and traversable, from one point of view. In this article, researchers point out the importance of the approach in research and make it possible to study all phenomena in the form of mixed and multi-methods, and triangulation. Naturally, each of these approaches requires a suitable method.

Results

A robust mixed methods study begins with a robust mixed methods research question or objective. Many researchers have reiterated the

fact that research questions are shaped by the purpose of a study and in turn shape the research methods and design, example, see (Bryman, 2007; Creswell & Tashakkori, 2007; Krathwohl, 1993; Newman et al., 1998; Rao & Woolcock, 2003; Tashakkori et al., 1998). Such research questions and goals with mixed methods require the use and integration of quantitative and qualitative approaches or methods. When a project investigates mixed research questions with interrelated qualitative and quantitative components or aspects (for example, questions such as "what and how" or "what and why"), the end product of the study (conclusions and inferences) will be. It also includes both approaches (Tashakkori & Creswell, 2007). Mixed methods are exemplified when a single study uses multiple or mixed strategies to answer the research questions and/or test hypotheses. Strategies are implemented concurrently or sequentially [QUAL + QUAN] (Martha et al., 2007). Figure 1 illustrates the hourglass model of empirical mixed research methodology writing.

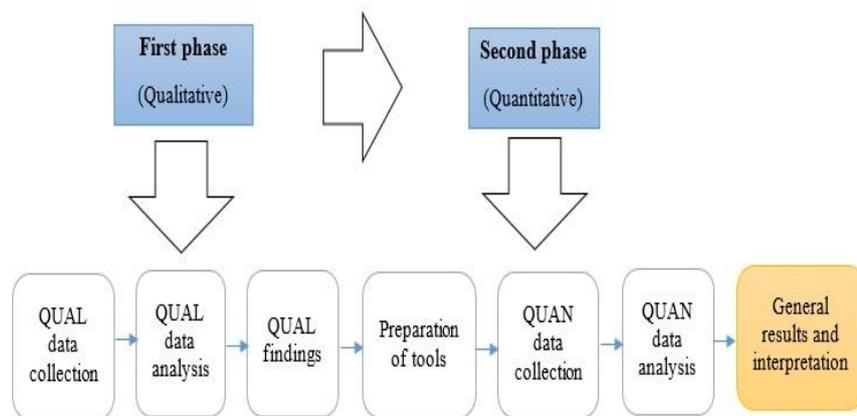


Fig1. Mixed methods research process (Creswell & Tashakkori, 2007)

A qualitatively-driven multimethod simultaneous design is comprised of two components that occur at the same time. The supplementary qual component takes place at the same time as the primary QUAL component as follows (Hesse-Biber et al., 2015):

QUAL + QUAN * Findings & Interpretation

This design usually consists of two separate datasets, which may or may not originate from two separate groups of participants, depending on the research question, and the availability of participants. The data also tend to be analyzed separately, with the results from the auxiliary secondary component supplementing the results from the primary component. There are various

reasons why this type of multimethod design might be used. One particular reason may be that the secondary qual component provides a second and different perspective to that offered through the sole use of the primary QUAL component. Another particular reason may be that the secondary qual component can be analyzed at a

different level (e.g.: micro-level) to the level at which the primary QUAL component is analyzed (e.g.: macro level) (Hesse-Biber et al., 2015). However, Mixed and Multi-methods (Table. 1) issues in qualitative studies exist (Morse, 2003).

Table 1: Characteristics of multimethod designs

Simultaneous	QUAL+qual indicates a qualitatively-driven, qualitative simultaneous design.
	QUAN+quan indicates a quantitatively driven, quantitative simultaneous design.
Sequential	QUAL → qual indicates a qualitative-driven project followed by a second qualitative project.
	QUAN → Quan indicates a quantitative-driven project followed by a second quantitative project.

Source: (Morse, 2003)

The multi-method is when two or more research projects are conducted, each complete in itself, to address research questions and/or hypotheses, a topic, or a program (Morse, 2003). As with mixed methods, the studies may be a combination of quantitative methods, qualitative methods, or both. The projects can be implemented concurrently or sequentially. However, unlike mixed methods, each study project is independently planned and conducted to answer a particular sub-question (Morse, 2003). For example, the purpose statement for multiple methods, or multi-method study might read: “The purpose of this sequential [QUALØ QUAN + QUAN] multi-method study is to design and provide the appropriate structural model for the success of customer relationship management in the sports service sector places in Iran explore (Pashaie et al., 2021). The first phase is the identification of indicators affecting the success of customer relationship management, and the initial fit of the model regarding the variables identified in previous

research and having a positive relationship, use of meta-analysis software (QUAN), the second phase (QUAL exploration) use the Delphi technique through semi-structured interviews with experts to design the success model of sports customer relationship management (QUAL), the third phase to determine the relationships between the structures, use structural equation modeling (QUAN) software. Themes from this qualitative data will then be developed into an instrument to survey structural equation modeling. Driessnack (2006) employed a sequential qualitatively-driven multimethod design (See Figure 2). She used a linguistic approach to narrative analysis (QUAL) for analysis of the narrative structure to consider how children shared their experiences of fear. Once this was complete within and across all 22 conversations, she returned to the children’s narratives to examine what the children had shared about their experiences of fear by using thematic analysis (qual) (Driessnack, 2006).

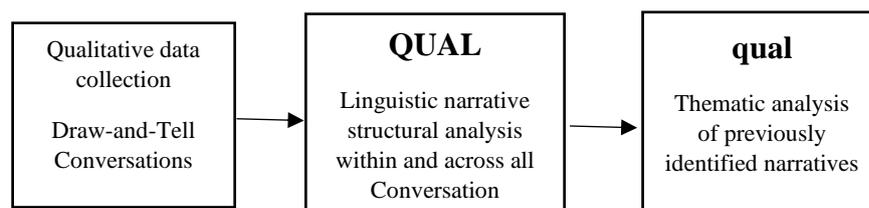


Fig 2. Driessnack’s exploratory sequential qualitatively-driven multimethod design

The multi-methods research is a mix of methods by combining two or more qualitative methods or two or more quantitative methods in a single research study. While mix-methods: a combination of quantitative and qualitative methods (or sources of data collection) in a single research.

There are four qualitative theoretical drive combinations and four quantitative theoretical drive combinations: [QUAL+qual],

[QUALqual], [QUAL+quan], [QUALquan] and [QUAN+quan], [QUANquan], [QUAN+qual], [QUANqual] (Table. 2). The plus sign (+) implies that the secondary or supplementary technique was applied concurrently or simultaneously during the same data collection period, while the arrow (→) implies that the second method was implemented sequentially or after the main data was collected (Creswell, 1999).

Table 2. Qualitative and Quantitative theoretical drive combinations

Design Type	Timing	Mix	Weighting/ Notation
Triangulation	Concurrent: quantitative and qualitative at the same time	Merge the data during interpretation or analysis	QUAN+QUAL
Embedded	Concurrent and sequential	Embed one type of data within a larger design using the other type of data	QUAN(qual) or QUAL(Quan)
Explanatory	Sequential: Quantitative followed by Qualitative	Connect the data between two phases	QUAN → qual
Exploratory	Sequential: Qualitative followed by Quantitative	Connect the data between two phases	QUAL → quan

Source: adapted from (Creswell & Tashakkori, 2007)

Triangulation is a method used to increase the validity and reliability of research findings, especially in qualitative studies and humanities. Supporters of this method believe that with this method, you can have more confidence in the accuracy of the results. On the other hand, it is wrong to use parallel tests as a principle in the scientific research method. There are four main types of triangulation (Bhandari, 2022):

1. **Data triangulation:** Using data from different times, spaces, and people. The simultaneous use of library studies, interviews, and questionnaires is another example of the trinity for data collection. Of course, these methods are parallel and not used simultaneously for the same purpose. In this approach, efforts are made to obtain data from various sources. For example, suppose you want to conduct qualitative research on a sports organizational phenomenon. For this purpose, you can use three categories of experts to conduct

specialized interviews: theoretical experts (university professors), managers of studied sports organizations, and managers of competing companies. This method is the best impression of triangulation, which greatly contributes to the richness of the data.

2. **Investigator triangulation:** Involving multiple researchers in collecting or analyzing data
3. **Theory triangulation:** Using varying theoretical perspectives in your research
4. **Methodological triangulation:** Using different methodologies to approach the same topic. In this approach, it is tried to use at least three methods to analyze research data. There is no problem if these three methods are in parallel. For example, suppose you identify categories with a qualitative method, screen them with a Delphi method, and rank them with a quantitative method, it is correct. While if you code the data of an interview with the

three methods of content analysis, theme analysis, and grand theory, it is wrong.

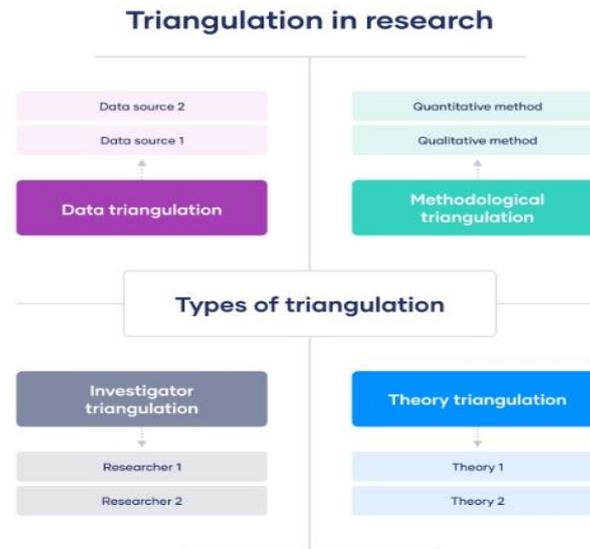


Fig 3. Types of triangulation in research (Bhandari, 2022)

With the triangulation approach, by asking questions from different points of view, an effort is made to reveal the hidden parts of the subject. One example of triangulation is using different methods to collect data on the same phenomenon. If you were studying how social media affects sports brand image, you could use surveys, interviews, and content analysis of social media posts to get a well-rounded understanding of the issue. One example of triangulation is Johnson et al (2017), a qualitative study aimed to identify system influences on decision-making in a pre-hospital setting with paramedics. The approach followed Denzin's multiple triangulation approach, which encourages several methods to collect data and multiple investigators with varied expertise (Noble & Heale, 2019). Phase I of the study focused on understanding the context of the study and included interviews with ambulance service staff and the collection of demographics and local policies. The second phase involved observation of paramedics' daily work to throw light on decisions related to transporting patients. Focus groups with paramedics, followed by focus groups with service users

were then completed to share personal experiences of the decisions made by the ambulance service in practice. The final phase included workshops to feedback on findings. Data were coded and thematically analyzed. The observations of paramedic shifts identified the complexities of the decision-making process related to the context. The observations were supplemented by interviews and focus groups. Each research method exposed one aspect of reality. This multimethod, multidisciplinary collaborative research was insightful. It permitted cross-validation and facilitated the exploration, of issues that influenced the decision-making of paramedics and the concerns and experiences of service users (Noble & Heale, 2019).

Therefore, triangulation is an effective strategy to combine the advantages of qualitative and quantitative methodologies. This can cut across the qualitative and quantitative gap (Yeasmin & Rahman, 2012). However, triangulation is a kind of precautionary measure adopted by the researcher to make sure that his/her collection, analysis, and interpretation of data in qualitative research is valid and credible. The reason is that

in qualitative research, the researcher is very close to the data, and as such, subjectivity is very high. As a consequence, to reduce subjectivity, and to make the qualitative phases of research more objective and credible, the researcher resorts to triangulating methodology, theoretical background underlying the research topic, and the interpretation of data (Gass & Mackey, 2016). A few questions may be helpful for anyone preparing to do "triangulation" research. Will it be cost-effective? Does the client approve to do effective 'triangulation'? Are the financial and human resources available to do 'triangulation'? Will 'triangulation' require the collection of new data? Will the key stakeholders provide relevant data for 'triangulation'? (Yeasmin & Rahman, 2012).

Discussion and Conclusion

The researcher/analyst must determine not only the existence and accessibility but also the accuracy and usefulness of documents, topics, and specific purposes, taking into account the main purpose of each research topic, and the context in which it was produced. The intended audience is an analyst of existing data, the researcher should make the analysis process as accurate and transparent as possible. Mixed-methods and multimethod research and triangulation are already a diverse and multidisciplinary research landscape and are likely to expand even further. However, there is a significant lack of systematic reviews that assess the prevalence and quality of mixed-methods and multimethod and triangulation research today. Therefore, an important aspect of future research will be to increase the scope of a systematic and comparative "prevalence rate literature" (Alise & Teddlie, 2010). The results of this research showed mixed method research is a research approach in which a combination of quantitative and qualitative methods is used simultaneously (Martha et al., 2007). This method is also known as exploratory mixed research design in studies. Usually, a mixed method is used to identify the underlying

categories of the studied phenomenon. Then, in the quantitative phase, a pattern is designed based on the identified categories. In general, in this type, a qualitative method and a quantitative method are used (Morse, 2003). While the evidence showed, in multi-methods, more than one quantitative or qualitative method is used. That is, two quantitative methods and one qualitative method may be used in the research or vice versa (Pashaie et al., 2021). Multimethod research is an attempt to combine research methods to address a particular research problem. It is a generic term that encompasses a wide range of research strategies: it may be deployed strategically; it may be used over the course of a research project; and it may breach the qualitative/quantitative divide or it may be practiced within each camp (McKendrick, 2020). Multi-methods promise new insights and perspectives in the understanding of phenomena in sports management research. Using more than one method offers the potential for a deeper understanding of the complex research problems that often confront the field of sport management. Today, sport management academics need to expand their understanding of all methods and combinations of methods, so they are prepared to answer research questions. The careful combination of both approaches above can allow the research to examine a problem from a range of complementary angles (Mackey & Bryfonski, 2018). When the researcher uses several research methods at the same time, considering several methods of data collection and interpretation, the results of the research will be more valid. To make better decisions, one should go for the triangulation approach. Due to the possibility of error in qualitative interviews, it is suggested to use several methods to collect data. The superiority of the triangulation methodology is that, at each stage of the research, the research question can be answered or a new question can be created by the theory, which means that it easily covers the research gaps and the results of this method are not influenced by the data and reduces the

limitations of research. These methodological developments bring both new challenges and opportunities (King & Mackey, 2016). Data triangulation is the use of a variety of data sources, including time, space, and persons, in a study. In this case, simultaneous validity (reliability in the time frame) will be achieved. It can also be done according to common levels (individual, group, organization, etc.). Triangulation offers an opportunity to address challenges such as data scarcity or unreliability, which are commonly encountered in environmental program evaluations, and any weaknesses in the data can be compensated for by the strengths of other data, thereby increasing the validity and reliance on- the ability of the results. Additionally, triangulation helps address the multidisciplinary nature of evaluation, it also tries to answer questions related to various fields of knowledge, unlike general research where the questions asked and the methods used are limited to a discipline or field of science (Carugi, 2016). However, effective 'triangulation' depends on coordination and collaboration; particularly those who are actively involved in collecting data and response (Yeasmin & Rahman, 2012).

If only one method is used, there may be a temptation to be overconfident in the strength of the findings. If the researcher uses two methods, the results may contradict each other. By using three methods to arrive at an answer to a question, two of the three methods may produce similar answers, thus providing greater confidence. Alternatively, three contrasting responses can be produced, suggesting that the question should be reframed, the methods revised, or both (Carugi, 2016). Generally, three are mainly recognized for combining multiple methodological approaches in a study. Mixed and multi-methods are focused on combining qualitative and quantitative methods. Triangulation is broader in the kinds of methods that are combined. It is often used as a combination of several qualitative methods. A major advantage of mixed methods research is

the ability to gain a rich, complete picture of the phenomenon under investigation. Multi-method research usually aims at broadening the scope of the research, and the findings of the different parts of the study will be combined. Triangulation aims at ensuring the findings are biased because of the use of a specific method (data triangulation, investigator triangulation, theory triangulation, methodological triangulation), usually through the triangulation of data obtained through different qualitative sources with descriptive and quantitative data.

Therefore, it seems that this methodology has not yet reached full maturity and will undergo new changes in the coming years. Understanding more than document analysis is critical if this research method is to be used effectively. This article helps to strengthen the knowledge base and promote the understanding of the research method as a multi-methods and mixed methods and triangulation research. It has described specific uses of methods and has delineated the advantages and limitations of this method. Therefore, from this point of view, triangulation is more comprehensive than the two methods mentioned, and in the period of late modernity and postmodernity, which emphasizes the new pragmatism, triangulation seems to have a wide range of applications. In other words, maximum use of all types of data and documents, both theoretical and experimental; Quantitative and qualitative and things like that have made triangulation occupy a privileged position in understanding the subjects studied and expanding the body of knowledge in the studied field. This article will help researchers to choose a suitable scientific research method and start their research project.

Limitations and benefits of integration

All types of research methods have limitations, but this does not mean that we should abandon research, but on the contrary, we should use several research methods together so that we can cover the limitations and reach valid results in our research. The use of 'triangulation', however,

will depend on the researcher's philosophical position (Yeasmin & Rahman, 2012). In the short history of the Journal of Mixed Methods Research (JMMR), early articles noted difficulties mixed methods researchers have faced in integrating the different strands of their work (Bryman, 2007; O'Cathain et al., 2007). While, the extent to which authors are employing integrated analysis strategies is increasing, and these are now more evident in JMMR than in mixed methods articles published in some disciplinary journals (Bazeley, 2009). The benefit that can come from integrating strategies through data collection, analysis, and interpretation is evidenced, for example, in a (Green, 2008) working paper reporting methodological issues in rating satisfaction with health services following diagnosis of fetal abnormality. In contrast, in studies where thematic and scaled or other numeric data are each available and could have been matched for each participant in a study, not doing so results in lost potential and possibly misleading conclusions (Bazeley, 2009).

The first problem with multi-method research when examining its limitations is failing to acknowledge that it requires more resources than single-method methods in terms of time, money, and researcher skills. Not all researchers are equally comfortable or adept at utilizing a range of methodologies. Due to this, multi-method research is generally less practical for small-scale research projects like the dissertations required for undergraduates. (McKendrick, 2020). Second, the quest for triangulation for congruence makes dealing with some discrepancies across datasets challenging. There is a special need to resist the temptation to determine which group of data is the most genuine. Thirdly, advocates of a multi-method study need to avoid presenting the "breadth" of the study as an intrinsic value (McKendrick, 2020). While seeking more complete knowledge is a noble aim that multi-method research may help to accomplish, multi-method research is only useful if the design allows the

subsequent/concurrent method to contribute significantly to what is learned from the previous components of the study. Similarly, it should not be expected that multi-method research would always decrease measurement error (Halverson, 2017). Fourth, there is a risk that, in attempting to capitalize on complementary strengths of various methods, the pursuit of multi-method research encourages a more limited application of specific methods than would otherwise be the case, as each is used based on an a priori understanding of its specific strengths (Creswell et al., 2004).

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