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The paradigm wars and the incompatibility thesis live on: Trends and adequacy in the use of mixed methods research in the Ghana Journal of Development Studies

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ABSTRACT
Despite the potential of mixed methods research (MMR) in providing a comprehensive picture of development issues, its pervasiveness and use in development studies is limited. This paper examines the use of MMR as reflected in contributions to the Ghana Journal of Development Studies (GJDS). Based on a rapid review and content analysis of 105 articles, published in the GJDS over the period 2010 to 2017, this paper illustrates there is an inadequate use of MMR among the community of researchers contributing articles to the GJDS. Specifically, only 16 percent of journal articles used MMR, whereas 52 percent and 32 percent used solely quantitative and qualitative approaches, respectively. The huge use of mono-methods and the paucity of MMR in the field of development studies suggest that the 'paradigm wars' and the 'incompatibility thesis' are not over. Eighty-six percent of articles that reportedly used MMR did not mention the purposes for employing it, explain the typologies of its designs used, the stages, or even the way the qualitative and quantitative data were integrated.

1. Introduction

Interest in mixed methods research (MMR) as a distinctive research methodology in social, behavioural, health sciences and development studies in general, has risen over the past four decades (Greene, 2008; Onwuegbuzie, 2012, De Allegri et al, 2018). The increased enthusiasm in MMR places it on a solid pedestal, as the third major research approach or *research paradigm*, along with purely qualitative research and quantitative research (Johnson, Onwuegbuzie, and Turner, 2007). According to Johnson et al. (2007, p.123).

> "Mixed methods research is the type of research in which a researcher or team of researchers combine 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".

The Johnson et al. (2007)'s understanding of MMR is adopted in this article because MMR is more than simply collecting both quantitative and qualitative data. The underlying logic of mixing methods is that, neither quantitative nor qualitative methods are sufficient in themselves to capture the trends and details of the situation (Creswell, Fetters & Ivankova, 2004). The combination of qualitative and quantitative techniques in a single study facilitates appreciation of problematic social phenomena (Alatinga & Williams, 2019). Since development studies is a multidisciplinary field, focusing on complex, dynamic, socio-cultural, politico-economic and environmental issues such as poverty, access to health, climate change, conflict and sustainable development amongst others, MMR may provide a more robust methodological approach for shedding light on these issues (Alatinga & Williams, 2019).

In order to provide evidence to support equitable and inclusive decision-making within the context of the Sustainable Development Goals (SDGs), critical reflection is essential, along with innovation and creativity, anchored on sound and balanced research, which MMR holds potential for (Cochrane & Thornton, 2018; Creswell, Fetters & Ivankova, 2004). Despite this inherent potential of MMR in

development studies research, there is currently a knowledge gap regarding the extent to which MMR is being utilized in development studies research in Ghana. A motivation for this line of inquiry follows the momentum, prominence and the value MMR is gaining in the social and behavioural sciences (Alise & Teddlie, 2010; De Allegri et al, 2018; Ngulube & Ngulube, 2015). Methodological reviews of MMR applications are important because such reviews do not only identify trends in the use of MMR but also provide valuable information to inform and improve MMR usage in future studies (Smith et al, 2021).

Against this backdrop, this paper provides a good opportunity to evaluate the frequency and use of mixed methods research in development studies research in Ghana, as reflected by the contributions to the *Ghana Journal of Development Studies* (GJDS). Our choice of the GJDS is premised on the assumption that development studies as a field addresses global development issues from multidisciplinary and interdisciplinary perspectives. In doing so, the paper answers the following questions:

1. To what extent is MMR used in articles published by GJDS*?*
2. What was the purpose of using mixed methods research?
3. What typologies of MMR design are used in GJDS?
4. At what stage of the study was the integration of methods achieved?

Essentially, this article provides methodological guidance among the community of development studies researchers and students interested in deploying MMR in their research projects. The rest of the article is structured as follows: conceptual issues and relevant literature are discussed in section 2. Section 3 exemplifies the research methodology deployed, while section 4 speaks to the results of the study. The results are then discussed in section 5. Section 6 concludes the article and makes some recommendations.

2. Conceptual, philosophical, and methodological debates: Building a conceptual framework for MMR

2.1 The Paradigm wars and the incompatibility thesis

Discussions on the possibility of truly mixing quantitative and qualitative methods in a single study have been ongoing for some time now. According to Morgan (2018), the relationship between qualitative and quantitative research is rooted in epistemological differences and remains a source of tension and contestation within MMR. The tension and contestation perhaps, originate from the problem of incommensurability (Ghiara, 2020; Brown et al., 2020) or the *incompatibility thesis and paradigm wars*—suggesting that qualitative and quantitative methodologies could not be mixed because of the incompatibility of their underpinning paradigms—qualitative research is rooted in constructivism, whereas quantitative research is cemented in positivism and post positivism (Alise & Teddlie, 2010; Gage, 1989; Howe, 1988). Brown et al. (2020), argue that an essential component of MMR is examining the implications of combining different methods. Because of the *paradigm wars and incompatibility thesis, early researchers advocated* methodological eclecticism in the study of development challenges (Howe, 1988). But Howe (1988) advanced an alternative view—*the compatibility thesis*. The compatibility thesis is premised on the tenets of pragmatism, which advocate a melange of the two approaches as a quintessential, distinctive, credible research approach and disproves the assertion that these two orientations are "epistemologically incoherent" (Howe, 1988, p.10). Building on the compatibility thesis, Onwuegbuzie (2012, p.197), also refuted the incompatibility thesis and postulated that, the traditional boundaries created between qualitative and quantitative methods are "false dichotomies". Johnson and Onwuegbuzie (2004), also rejected the incompatibility thesis and recommend pragmatism—where a combination or mixture of methods and procedures that work best for answering the stated research questions are chosen. Johnson and Onwuegbuzie (2004), contended that pragmatism as a paradigm may help build bridges between conflicting philosophies. A pragmatic view of research is necessary to improve communication among researchers from different paradigms in the process of knowledge creation. Ghiara (2020), also rejects the *paradigm wars and incompatibility thesis,* and argued that drawing on the tensions and differences between methods, as well as their

synergies and similarities may provide practical lessons for MMR application.

Indeed, pragmatism triumphed, leading to widespread acceptance of the compatibility of qualitative and quantitative research in a single study as a distinct methodology on its own (Johnson & Onwuegbuzie, 2004; Morgan, 1998, 2018; Shannon-Baker, 2015). The acceptance of MMR particularly gained prominence in the research community because the world today has become increasingly complex, interdependent, multidisciplinary, and dynamic. Thus, researchers need a clear understanding of mixed methods, as used by other researchers to aid communication, and encourage collaboration (Johnson & Onwuegbuzie, 2004).

At this juncture, it is perhaps opportune to distinguish between triangulation and MMR. This distinction is quintessential, following Denzin's (2012), clarion call to researchers, not to confuse triangulation with MMR. Ngulube and Ngulube (2015, p.4), observed that there is a misunderstanding regarding *triangulation* as a social science methodology and *triangulation* as a research design in MMR. As a social science methodology, triangulation checks the validity of an answer, "not so as to gain further information in order to produce an answer" (Hammersley, 2008, p. 23). Thus, triangulation suggests that, by drawing data from sources that have potential threats to validity, it is possible to reduce the chances of reaching false conclusions (Hammersley, 2008). In other words, methodological triangulation speaks to the use of different sources of data, to check the validity of conclusions, to ensure that conclusions reached are more commendably credible when the different data sources converge, and vice versa.

Thus, using different data collection methods such as in-depth interviews, focus group discussions, key informant interviews, observation, and surveys typifies methodological triangulation and not necessarily MMR. Essentially, triangulation can occur in purely qualitative or quantitative study designs. In contrast, MMR transcends the simple mixing of data from quantitative and qualitative data (Ngulube and Ngulube, 2015). MMR is rooted in philosophical assumptions discussed earlier and entails a deliberate and planned sequence of collecting, analysing, and combining or integrating quantitative and qualitative data at different phases of the research process, to draw on the strengths of each (Creswell, Klassen, Plano Clark, and Smith, 2011). The implication is that, in MMR, there must be a deliberate attempt to integrate data from the two methods to add value to the research process. Having established itself as the third comprehensive methodological arm, various aspects of MMR—its purpose and rationale, design typologies, and how to achieve integration have been discussed in the literature (Bryman, 2006; Creswell, 2014; Fetters, Curry & Creswell, 2013; Fetters & Freshwater, 2015; Greene, Caracelli & Graham, 1989; Hesse-Biber, 2010). These issues are briefly discussed in the ensuing sections.

2.2 Purpose of conducting MMR

A mixed method research from the onset, must clearly enunciate its purpose and rationale. The fundamental purpose of applying MMR is premised on the idea that when both qualitative and quantitative techniques are integrated, light is shed on research problems and complex phenomena than either approach alone (Creswell & Plano Clark, 2007). Stating the purpose for mixing methods is imperative, to enable readers appreciate the value additions made in advancing knowledge. Given that MMR demands some level of expertise in both qualitative and quantitative methods, and its expensive and time consuming nature, it is argued that, if there is nothing new to be gained both in content and methodology from mixing methods, it is preferable to use mono-method approaches—either purely qualitative or quantitative (Fetters, 2018; Molina-Azorin & Cameron, 2010).

Several reasons for conducting MMR abound (Bryman, 2006; Collins, Onwuegbuzie & Sutton, 2006; Greene et al., 1989). Collins et al. (2006), proffer the following four reasons for conducting MMR: participant enrichment, instrumentality fidelity, treatment integrity and significance enhancement (see Collins, Onwuegbuzie & Sutton, 2006, for a discussion of these issues). Greene et al. (1989) suggest five important reasons for conducting MMR, which are very germane to the present study: development, initiation, complementarity,

expansion, and triangulation. *Triangulation* entails the process of applying both qualitative and quantitative methods in studying the same research question, to assess the same facet of the research phenomenon under investigation (Alatinga & Williams, 2019; Greene et al., 1989). Specifically, triangulation here seeks convergence, corroboration, and correspondence between all the methods used in collecting data—quantitative and qualitative, for the purposes of enhancing the trustworthiness and salience of the research results (Bryman, 2006; Hesse-Biber, 2010).

Development or *building* occurs when the results from one method are used to develop or inform the other method (Fetters et al., 2013; Greene et al., 1989, p.259). For example, results from an initial small explorative (qualitative) study, could be used to develop or build a questionnaire for a later, large survey for the purposes of generalizing the research findings. *Complementarity* "seeks elaboration, enhancement, illustration and clarification of the results from one method with the results from another" (Greene et al., 1989, p.259). In complementarity, one method is used to improve the performance of the other (Morgan, 1998). The aim of *initiation* is to discover paradoxes, contradictions, and new perspectives of frameworks by "recasting questions or results from one method with questions or results from the other method" (Greene et al., 1989, p. 259). The basic idea in *initiation* is that results of a study may provoke questions or contradictions that will require explanations, which may usher in new research (Hesse-Biber, 2010). As the name suggests, the aim of *expansion* is to increase the extensiveness and scope of analysis through the application of different techniques for different inquiry dimensions (Greene et al., 1989, p. 259).

2.3 MMR design typologies

MMR design typologies abound. Basic designs—exploratory sequential, explanatory sequential and convergent/concurrent or parallel designs (Creswell, 2014), as well as advanced applications—embedded, nested, transformative and mixed methods community-based participatory research design typologies exist (DeJonckheere, Lindquist-Grantz, Toraman, Haddad & Vaughn, 2018: Fetters, Curry, and Creswell, 2013). Two major factors may guide researchers in the design of MMR—*implementation of data collection*—that is, the sequence used to collect the data *and priority.* Data may either be collected simultaneously, known as convergent/concurrent or parallel designs or may be collected in stages, known as sequential designs (Molina-Azorin & Cameron, 2010). When the intention of a researcher is to compare congruence of research findings, concurrent designs are often used (Molina-Azorin & Cameron, 2010). In sequential designs, either qualitative or quantitative data are collected first. Here, the sequence relates to the objective for mixing the methods. When qualitative data collection takes precedence or is prioritised (exploratory sequential) over quantitative data, the objective is to first explore the problem under investigation and then follow up with quantitative data, for a large sample that may permit generalisation of the findings to the population (Molina-Azorin & Cameron, 2010). When the objective of a study is to test the variables with a large sample, a quantitative data collection (explanatory sequential) process is first undertaken, and then followed up with a more detailed examination of selected cases in the qualitative phase (Molina-Azorin & Cameron, 2010). These basic design typologies will be expatiated on later, under the stages of MMR integration.

Priority refers to the weight that the researcher places on either approach. So, depending on the research questions, MMR designs can be divided into equivalent statuses and dominant/less-dominant designs (Molina-Azorin & Cameron, 2010). In equivalent status designs, equal priority or weight is given to both qualitative and quantitative approaches. Most convergent/concurrent or parallel MMR typify equivalent status designs. Regarding dominant/less-dominant designs, priority may be given to either the qualitative or quantitative approach. In qualitative dominant MMR designs, priority is given to the qualitative data collection phase, which is supplemented by quantitative data collection. The opposite is the case in quantitative dominant MMR designs. That is, the research design in this case is largely quantitative in nature, with a small supporting qualitative phase to explain specific aspects of the quantitative data.

2.4 Stages of MMR integration

Integration or mixing of methods is at the heart of MMR (Brannen, 2018; Fetters 2018; Fetters & Molina-Azorin, 2017; Fetters & Freshwater, 2015; Fielding, 2012; Bryman, 2007, 2006). Integration describes the process of combining qualitative and quantitative methods and components for the purpose of producing a new whole or a more holistic understanding than achieved by either alone (Fetters & Molina-Azorin, 2017, p. 293). Integration serves as the link between the qualitative and quantitative approaches. There must be an intentional and explicit effort to integrate the two approaches in a manner so as to maximise understanding and produce findings that are greater than the sum of the parts (Woolley, 2008).

It is essential to ensure that the components of a mixed methods study are genuinely related to each other because maximising the potential of MMR depends on how well integration has been done (Bryman, 2007; Woolley, 2008). Mixing qualitative and quantitative data collection without integration sum is no more than the independent parts—the 1+1=2 analogy (Fetters, 2018). The 1+1=2 describes the instance where researchers use qualitative methodology, one, and quantitative methodology, one, but added together they achieve only two, that is two independent studies without integration with each other (Fetters 2018, p.263). This implies that the authors have not addressed the issue of integration. Because MMR is a novel third methodology, thoroughly integrated mixed methods studies should rather speak to 1+1=1. That is "one methodology, that is, qualitative methodology, plus one methodology, that is, quantitative methodology, equals one NEW methodology, i.e., mixed methods methodology" (Fetters 2018, p.262). Greene et al. (1989) reported that out of 57 MMR articles they studied, 44 percent of them did not combine qualitative and quantitative data, and only 5 of the articles successfully integrated the qualitative and quantitative data during analysis. These views imply that despite the potential of MMR in better explicating complex phenomena, achieving integration remains a challenge.

Integration in MMR can be achieved in three stages—design, methods, and interpretation and reporting. At the *design stage*, integration can be achieved through three basic designs—exploratory sequential, explanatory sequential and convergent/concurrent designs. In the exploratory sequential design, qualitative data are first collected and analysed, and these results inform subsequent quantitative data collection. For example, results from focus group discussions or in-depth interviews may be used to develop a questionnaire for survey administration. In the explanatory sequential design, quantitative data collection and analysis are done first, and then the results inform subsequent qualitative data collection and analysis.

For example, quantitative survey results such as figures and percentages may be made more meaningful when they are supported by direct quotes from focus group discussions or in-depth interviews. In the convergent/concurrent designs, both qualitative and quantitative data are collected concurrently, and analyses for integration occur after data collection (Fetters et al., 2013). Often, the two forms of data are analysed separately and merged. For example, a questionnaire containing both closed and open-ended questions may be used in the data collection process (see Alatinga & Williams, 2019 and Fetters et al., 2013 for details). At the *methods stage*, integration can be achieved in four ways—connecting, building, merging, and embedding (Fetters et al., 2013). Integration through *connecting* occurs when one type of data links with the other through the sampling frame. In *building,* integration occurs when results from one data collection procedure informs the data collection approach of the other procedure, the latter building on the former (Fetters et al., 2013). Similarly, in *merging* of data, integration occurs when the two datasets are brought together for analysis and comparison. During *merging*, quantitative numerical results may be complemented by qualitative texts or quotes, leveraging on the strengths of focus group discussions and in-depth interviews (Alatinga & Williams, 2019). In *embedding,* integration occurs when data collection and analysis are linked at multiple points. The embedding process involves any combination of connecting, building, or merging. Its cardinal attribute is linking

qualitative data collection to quantitative data collection at multiple points repeatedly (Fetters et al., 2013).

Integration of qualitative and quantitative data at the *interpretation and reporting stage* occurs through three approaches— narrative, data transformation and joint displays. Integrating through narrative demands that researchers describe the qualitative and quantitative results in a single or series of reports. Integration through narrative can be achieved through three approaches, namely weaving, contiguous and staged approaches (Fetters et al., 2013). The *weaving approach* involves writing both qualitative and quantitative results together on a theme-by-theme or concept-by-concept basis. Regarding the *contiguous approach*, integration involves the presentation of results within a single report, but the qualitative and quantitative results are reported in different sections (Fetters et al., 2013). The *staged approach* to integration occurs in multistage mixed methods studies, when the results of each step are reported in stages as the data are analysed and published separately (Fetters et al., 2013).

Integration through *data transformation* is done or achieved as follows. Firstly, one type of dataset is transformed into the other type —quantitative into qualitative or qualitative into quantitative. Secondly, the transformed dataset is then combined with the dataset that has not been converted (Fetters et al., 2013). Integration through *joint displays* occurs when data are brought together through a visual means to draw out new insights beyond the information gained from the separate qualitative and quantitative results. This happens through organising related data in a graph, table, figure, or matrix (Fetters et al., 2013).

3. Methodology

3.1 Review approach

A rapid review of articles published by the GJDS was conducted in 2018 to synthesize evidence on the use of MMR in development studies in Ghana (Tricco et al., 2015). The GJDS was purposively selected because it is an important refereed International Scientific Indexing (ISI) accredited journal that promotes rigorous and interdisciplinary intellectual research in the field of development studies in and around Africa. Besides, the literature suggests that peer-reviewed scientific journals publish substantial portions of scientific information (Bryman, 2008). For this reason, it might be possible to measure or estimate the growth of mixed methods research in a particular discipline by using journal articles (Ngulube & Ngulube, 2015). The rationale is that peer review processes may provide a quality control mechanism (Bryman, 2006). We chose the period 2010 to 2017 because we were interested in assessing the recent practices and determining the progress made in the use of MMR in the GJDS. De Allegri et al. (2018), reviewed 105 MMR articles over a 26-year period and found that, about 60 percent of the articles were published in 2010 or later, as compared to only 3 percent being published before the 1990-99 decade. For this reason, this period is recent, offering the opportunity to see how research designs are applied in current settings. The period of eight years provides a- long -enough interval for assessing research within the field of development studies.

3.2 Procedures and selection criteria

From 2010 to 2014, all articles in the GJDS were published in hardcopies, in the form of manuscript but since 2015 the journal has been publishing online and hosted by African Journal Online (AJOL). Thus, our review process naturally proceeded using two different search strategies—manual and electronic online search. In the first instance, we wrote to the editorial chair of the GJDS for permission and collected all the different volumes of the journal, published from 2010-2014. Electronically, we downloaded all the articles published in the GJDS from 2015-2017 from AJOL. In both instances, the inclusion criteria were to review all articles reporting empirical primary or secondary data. Thus, we excluded book reviews and conceptual or theoretical papers because these did not mention anything about the empirical methods employed. We then read through the abstracts of all the empirical articles to identify those that met the inclusion criteria. After reading through the abstracts, we reviewed the other sections of the articles. Because our research objectives seek to make methodological contributions to MMR literature, we systematically paid greater attention to

reviewing the methods sections of the articles to establish the application of research methods in general, the use of MMR, the purpose of using MMR, the type of mixed methods designs used and the stages at which integration or mixing was done. This process resulted in the retrieval and screening of 105 articles published in the GJDS during the period. After screening these articles, 15 articles did not meet the inclusion criteria because they were either conceptual papers or book reviews, leaving only 90 articles eligible for the review.

3.3 *Data analysis*

Consistent with the study objectives, quantitative content analysis was employed to determine the extent to which authors in the field of development studies used MMR as reflected by their contributions to the GJDS over an eight-year period—October 2010 to October 2017. We read thoroughly through to familiarise ourselves with the contents of the articles that supposedly deployed MMR. Following this, we tabulated all the articles year by year and examined the number and frequency of articles that explained the typologies of MMR designs used and how MMR integration was achieved. Based on these processes, we determined the number of articles that appropriately deployed MMR, based on the indicators described briefly below. Content analysis has been appropriately deployed (Bryman, 2006; Ngulube & Ngulube, 2015) to identify the extent to which scholars used mixed methods research. To provide decision criteria or indicators for gauging the adequacy of use to which articles in the GJDS appropriately deployed MMR, we intuitively developed an evaluation criterion based on indicators of evidence of the mention of MMR, statement of the purpose of the MMR, MMR design typology and the strands of integration. Based on this criterion, we classified the articles into —no use of MMR, very inadequate use of MMR, inadequate use of MMR, adequate use of MMR, and very adequate use of MMR. In the first place, where an article in the GJDS did not specifically mention MMR, we classified such an article not to have used MMR. Secondly, where an article only mentioned MMR but did not address any of the three indicators, we classified it as very inadequate use of MMR. Thirdly, articles that addressed at least one (1) of the three research questions, the use of MMR was considered inadequate. Adequate use of MMR was considered where an article addressed 2 of the three research questions. Finally, very adequate use of MMR was considered where the article addressed all the three research questions.

4. Results

4.1 MMR prevalence in the GJDS (2010-2017)

As illustrated in Figure 1, the categorisation of journal articles into qualitative, quantitative, and mixed methods methodologies demonstrate that contributors to the GJDS predominantly used quantitative methods. Fifty-two percent of the articles used quantitative methods, specifically the survey design. Qualitative techniques accounted for 32 percent of the articles published. The dominant qualitative approach used was a case study. Fourteen articles, representing 16 percent used MMR in the GJDS during the period under review.

4.2 Statement of the purpose, design typologies, and methodological integration in the use of MMR in the GJDS

Of the 14 articles that reportedly used MMR in the GJDS, only two articles, representing less than 2 percent of the articles stated the purpose of employing MMR. The first article explicitly stated the purpose of using MMR as follows: “MMR provides a broader understanding of the research problem than either qualitative or quantitative approach alone”. The second article that stated the purpose of MMR indicated that, “Mixed research approaches minimize some of the limitations of using a single approach”. We found that only one article stated the MMR design type used. The article used the convergent/parallel mixed methods research design. The rest of the 13 articles merely mentioned MMR without clearly stating the design type applied. In Table 1, we present the attributes of articles published in the GJDS—detailing the number of mixed methods research articles, the purpose for deploying MMR, the MMR designs used and the stages of MMR integration for the period under review.

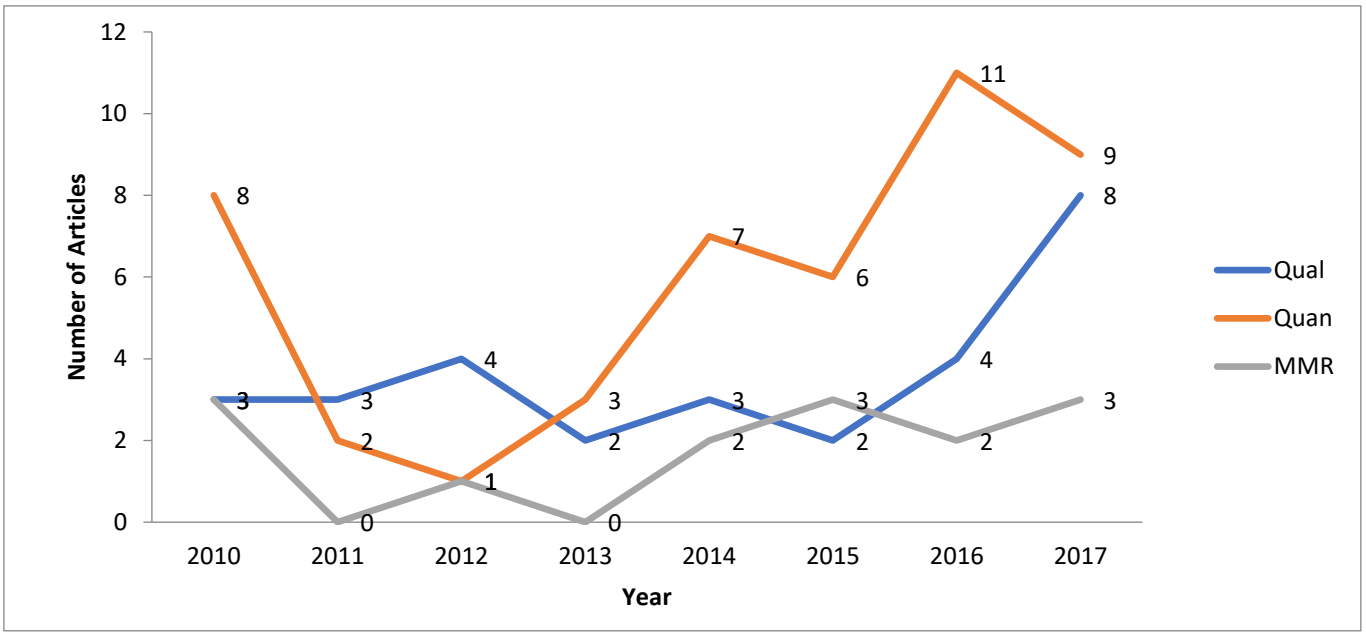

Figure 1: Trends in the use of MMR in the GJDS Authors' Research (2021)

Based on the indicators developed in section 3.3, and relying on the results presented in Figure 1, from 2011 to 2013, the articles that reportedly deployed MMR design did not specifically mention MMR in their content—in the abstract and particularly the methods section, suggesting that these articles did not in practice, use MMR. Additionally, even the articles that specifically mentioned MMR in their content did not explicitly state the purpose of the MMR and did not explain the MMR designs used. Similarly, these articles did not explain how both the qualitative and quantitative data sets were integrated, and the status or priority given to each phase of the MMR. In other words, all the articles failed to clearly state the timing or status of the methods used—whether equal weights or priority was given to both the qualitative and quantitative methods (equivalent status), or qualitative dominant or quantitative dominant designs were used and the reasons for doing so. In the light of these affordances and based on our indicators, these articles merely mentioned MMR but did not address any of the three stated research questions, suggesting *very inadequate use of MMR* in this context.

Remarkably, of the fourteen articles that used MMR, it was only in 2014 that one article indicated the purpose of using MMR. In 2015, one article also indicated the purpose of using MMR but failed to indicate the type of MMR design used as shown in Table 1. The rest of the twelve articles did not indicate the purpose of using MMR and the MMR designs used. Clearly, from Table 1, none of the fourteen articles showed the stages at which the integration of qualitative and quantitative data was done. In fact, even in the results sections where data is reported and interpreted, the authors did not mention any of the approaches through which integration can occur at this stage, such as weaving, contiguous, staged, data transformation, or joint displays. Putting these pieces of evidence together suggest an inadequate use of MMR in the articles published in the GJDS.

Table 1: Characteristics of MMR Articles in *GJDS*

Year	No. MMR Articles	Purpose of MMR	MMR Designs Used	Stages of Integration
2010	3	All the three articles did not state the purpose of MMR	The articles did not explain the MMR designs used	Integration was not done in all the three articles
2012	1	The purpose of MMR was not mentioned by the author	The article did not explain the MMR design used	Integration was not done
2014	2	One (1) of the articles explicitly stated the purpose of combining qualitative and quantitative techniques as follows: "MMR provides a broader understanding of the research problem than either qualitative or quantitative approach alone"	The article used the convergent/parallel mixed methods design	Integration was not done
2016	2	Both articles failed to state the purpose of MMR	Articles failed to mention the MMR designed used	The articles also failed to integrate the qualitative and quantitative findings
2017	3	All three articles did not state the purpose of MMR	The articles also did not explain the MMR designs used	Integration was not done in all the three articles
Total	**14**			

Authors' research (2021)

5. Discussion

To the best of our knowledge, this work constitutes the first attempt to systematically review the extent to which development studies research reported in the GJDS embraced MMR. The most striking finding relates to the inadequate use of MMR among the community of researchers contributing articles to the GJDS. The results imply that researchers are still very comfortable with mono-method, perhaps due to their disciplinary orientations. Even so, the results are consistent with similar earlier studies. For example, Ngulube, Mokwatlo and Ndwandwe (2009) found that qualitative research approaches accounted for 57 percent, while quantitative and MMR approaches accounted for 38 percent and 5 percent respectively. Alise and Teddlie (2010), on the prevalence of methodological approaches across the Social/Behavioural science, found a 5 percent prevalence rate for MMR. Also, Ngulube and Ngulube (2015) found that 89 percent of articles used quantitative research approaches, while qualitative and MMR approaches constituted 9 percent and 2 percent respectively.

Even though in absolute terms the 16 percent prevalence of MMR reported in the GJDS *is* still much higher than these earlier studies and encouraging, based on the indicators developed above, these articles fall short of being considered MMR. This scenario signals that the paradigm 'wars' and incompatibility thesis (Alise & Teddlie, 2010; Gage, 1989; Green et al., 1989), might not be over yet. It could also be a manifestation of practical difficulties such as inadequate time and financial resources, as well as the requisite skills set needed to execute a mixed methods study (Bryman, 2007). Bryman (2007) points out that MMR requires that researchers have a broader set of skills spanning both the qualitative and quantitative approaches.

As indicated earlier, it was only in 2014 and 2015 that two articles out of the fourteen stated the purposes of MMR. Ngulube and Ngulube's (2015), also reported that only one article articulated the purpose for mixing methods. Similarly, Bryman (2006), established that many researchers fail to state the purpose of deploying MMR in advance. In this regard, it is remarkable that two of the articles published in the *GJDS* clearly stated their purposes of using MMR. It is remarkable

because the central premises for using MMR in these articles are for broader understanding of the research problem and to minimise some of the limitations of using a single approach. These purposes for using MMR by the authors are consistent with the growing mixed methods literature. In fact, some of the pioneering and distinguished MMR researchers including Creswell and Plano Clark (2007), proffer similar reasons for engaging in MMR. Further, as Table 1 illustrates, only the 2014 article clearly stated the MMR design used—the convergent/parallel mixed methods design. Clearly stating the MMR design used in the GJDS is commendable because literature reports that one of the key challenges facing mixed methods researchers is how to determine the mixed methods design typologies (Ngulube & Ngulube, 2015).

It is conspicuous from Table 1 that none of the fourteen so-called mixed methods articles addressed the core interest of MMR—methodological integration. In practice, articles that have not achieved mixed methods integration should not be considered to have used MMR. For instance, in our review, the two articles that stated the purposes and explained the type of MMR designs used, failed to show how and at what stages the integration of the qualitative and quantitative data sets was done. This implies that only these two out of the 14 articles (14 percent) that supposedly deployed MMR adequately answered research question two, leaving research questions three and four unaddressed. Strikingly, the remaining twelve articles (86 percent) failed to adequately answer the stated research questions 2-4— that is, these articles did not: mention the purposes for employing MMR; explain the typologies of MMR designs used; explain the stages, and how qualitative and quantitative data were combined.

Consequently, the authors set out to conduct a mixed methods study, but they have not fully succeeded in doing so because the components of their mixed methods investigation were totally independent of each other. This situation speaks to the integration challenge in MMR known as 1+1=2 (Fetters & Freshwater, 2015), as explained earlier in section 2.3. Fetters and Freshwater (2015) noted that many researchers fail to achieve integration and admonished mixed methods researchers to deliberately plan their studies to leverage integration. Because the authors have not achieved integration, their works have not benefited from the power of MMR, because the essence of combining methods is to attain a whole greater than the sum of the individual parts (Fetters, 2018). Bryman (2007) and Ngulube and Ngulube's (2015), revealed that authors partially integrated results from both qualitative and quantitative approaches. Bryman (2007) therefore, suggests that researchers must pay attention to the integration of qualitative and quantitative findings because MMR must be judged by the extent to which different components of the two techniques are fully integrated.

The literature suggests that meaningful integration of qualitative and quantitative data remains elusive because researchers of MMR experience difficulties in integrating the analysis and interpretation of the qualitative and quantitative datasets (Alexander et al., 2021; Lynam et al., 2020). Similarly, Mason et al. (2020), asserted that meaningful integration in MMR is not yet fully developed in practice. Love and Corr (2021), indicated that even though integration positions scholars firmly to draw robust conclusions, initiate novel understanding and appreciate a more complete picture of the phenomenon under study, it risks becoming yet another research concept without a concise meaning.

6. Conclusions and recommendations

Even though MMR offers an opportunity for explaining complex phenomena in development studies, the community of researchers contributing articles to the GJDS has not adequately exploited that potential. Our review clearly demonstrates an inadequate use of MMR among the community of development studies researchers, as reported in the GJDS. The limited use of MMR as reflected in the contributions to the GJDS, could be attributed to practical issues of constraints of time and resources as well as the requisite expertise needed to adequately execute a mixed methods study. It could also speak to the fact that many contributors to the GJDS are still very comfortable with mono-method and being conscious not to lose hold of their disciplinary turfs. This situation may paint a picture that the '*paradigm wars' and 'incompatibility thesis'* are not over. Even so, the limited use of MMR is not peculiar to the Ghana

Journal of Development Studies. Relatively, the 16 percent prevalence of MMR reported in the GJDS during the period under review, compared to similar earlier studies is commendable. Our intention in this paper is not to obligate every research study in the GJDS to use MMR but to provoke debate and motivate scholars contributing to the GJDS to consider using MMR because of its potential to help provide a comprehensive understanding of development studies. Even though our review is based only on the GJDS, it nevertheless, offers a great opportunity to appreciate the extent to which MMR is being deployed in research in the field of *development studies*. Our paper uniquely contributes to the MMR literature because it spells out the fundamentals of conducting MMR, in plain and concise language, to assist other scholars and students in learning these fundamentals. We recommend that future studies of this nature should go further to interview some authors on why they choose qualitative methods only, quantitative methods only or MMR in their studies.

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