

# Utilisation and prevalence of mixed methods research in library and information research in South Africa 2002-2008<sup>1</sup>

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*This article explores the use of mixed methods research (MMR) in library and information science (LIS) research in South Africa from 2000 to 2008. The authors contrast the mixed methods research debate in the general methodological literature to how this method was practiced within the LIS scientific community. They reviewed 613 research articles published in six peer-reviewed LIS journals in South Africa, finding the research methods in these journals to be surveys drawing on positivistic assumptions and cross-sectional designs, and historical research based on constructivist knowledge claims. Mixed methods approaches that the authors identified in the methodological literature have had little impact on LIS research in South Africa. Given these limitations, the authors argue for greater methodological pluralism in conducting research in LIS and recommend the use of mixed methods research.*

**Keywords:** Evaluation of research; methodological pluralism; mixed methods research; research design; research in library and information science

## I Introduction

This study explores the use and prevalence of mixed methods research (MMR) in library and information science (LIS) research in South Africa between 2002 and 2008. The utilisation of MMR provides a possibility of bridging the ontological, epistemological, axiological, rhetorical and methodological divides between qualitative and quantitative paradigms.<sup>5</sup> The qualitative or quantitative approach may be inadequate to investigate in full the complex issues facing researchers (Phillips 1988). The assumption is that mixing or integrating methods can add insights and understanding that might be missed when a mono-method (qualitative or quantitative) strategy is used. Using MMR provides researchers with the possibility of addressing issues from a large number of perspectives. That in turn may enrich and enhance the research findings. In other words, "besides producing better research, mixed methods might also help heal professional rifts between qualitative oriented researchers and quantitative – study proponents" (Viadero 2005).

Many fields, including LIS, are advocating and using MMR (Creswell 2009:98; Fidel 2008; Johnson, Onwuegbuzie & Turner 2007:112). In that regard, this research partly aims at opening up debate on the use of MMR in LIS research in South Africa and raising awareness on the utility of MMR in producing valid, balanced and comprehensive evidence. There is no significant discourse around MMR in research findings reported at major LIS conferences and workshops in South Africa.

Major conferences and workshops that come to mind are those that are hosted annually or biennially by organisations such as the Library and Information Association of South Africa (LIASA), Poussière d'étoiles (Pd'é), Progress in Library and Information Science in Southern Africa (ProLISSA), South African Society of Archivists (SASA), University of Johannesburg (Department of Information and Knowledge Management), University of Stellenbosch [International Symposium on the Management of Industrial and Corporate Knowledge] (ISMICK), University of Zululand (Department of Information Studies Annual Conference), University of South Africa (Annual Research Symposium) and the World Wide Web Applications.<sup>6</sup> It was in that light that the researchers in the current study were curious to find out how far LIS researchers in

1. This article is a reworked version of papers presented at the 10<sup>th</sup> DLIS Annual Conference at the University of Zululand, 10-11 September 2009 and at the 11<sup>th</sup> LIASA Annual Conference on Library and Information Services on the Move, held from 28 September - 2 October 2009 at the Central University of Technology, Bloemfontein, South Africa.

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5. These terms are derived from ontology (assumptions concerning reality), epistemology (knowledge of that reality), axiology (values and acquisition of knowledge), rhetoric (aesthetic modes of knowing that reality including language of reporting) and methodology (particular ways of knowing that reality) (Creswell 2003; Greene 2008; Sale, Lohfeld & Brazil 2002; Sandelowski 2003; Teddlie & Tashakkori 1998).

6. We have attended most of the listed conferences since the year 2000, either as paper presenters or as ordinary participants.

South Africa had embraced this emerging third research approach in their work published in scientific journals in South Africa.

Following Hider and Pymm (2008) and Järvelin and Vakkari (1990) the study is confined to analysing journal articles instead of monographs. Creswell and Garrett (2008:324) conceded that journals are one of the indicators that may be used in measuring the extent of the growth of MMR in a discipline. The assumption is that journals reflect current research better than monographs. Although conference papers and theses may have the same value as journals, they were not used in this research as they were not readily available online, (that is, one of the criteria used to select articles that were used in the inquiry). Arguably, they might have shed more light on the methodologies used by LIS researchers in South Africa than the journals that were singled out.

The rest of this article is in seven sections. We begin by discussing the “paradigm wars” and MMR as a third research approach. Next we review the definitions of mixed methods research. The rationale of using MMR is then presented. This is followed by the statement of the problem and the research questions. We then turn to the methodology and the discussion of the results. In the last section, we give recommendations and conclusions based on the findings.

## 2 Mixed methods: the third research approach

It was not until 20 years ago that mixed methods research as we know it today started (Tashakkori & Creswell 2008; Creswell 2009; Greene 2008). It did not emerge prior to that partly as a result of the “paradigm wars” or the “great qualitative-quantitative debate” of the 1970s to 1990s (Greene 2008; Sale, Lohfeld & Brazil 2002). The “paradigm wars” were between the positivists and constructivists. The rise of a new breed of researchers who were not prepared to perpetuate the antagonism between the positivist and constructivist worldviews (Bergman 2008) saw the affirmation of MMR as a third research paradigm along quantitative and qualitative worldviews.

The quantitative paradigm with its positivist stance viewed research as objective, context-free and with outcomes that can be determined reliably and validly. That view has dominated research thinking in many disciplines since the nineteenth century (Bahl & Milne 2006:198; Onwuegbuzie & Leech 2006:479; Leech & Onwuegbuzie 2009:266). Criticisms of the positivist paradigm led to the rise of the qualitative research paradigm between 1900 and 1950 (Denzin & Lincoln 2002; Guba & Lincoln 2000). In line with their ontological, epistemological, axiological and methodological assumptions and principles, qualitative researchers reasoned that research is naturalistic or constructivist or interpretivist. They claimed that reality is locally and socially constructed, and context-sensitive, the knower and the known are inseparable and values of the researcher influence the outcome of the investigation (Lincoln & Guba 1985:37; Tashakkori & Teddlie 1998:10).

For some time, many scholars paid attention to the differences between the two paradigms with scholars routinely denigrating the methodology of the other camp as inferior and insufficient. This antagonistic conceptualisation of research standpoints led to the outbreak of “paradigm wars” and the emergence of the “incompatibility thesis” (Guba & Lincoln 2000; Howe 1988; Tashakkori & Teddlie 1998). The hallmark of the incompatibility school was its emphasis on the single method approach when conducting an inquiry, and they regarded themselves as methodological *purists*. The *purists* were skeptical about mixed methods research. The argument was that one cannot mix the two paradigms because they arise from different worldviews (Bban 2008). Nowadays, scholars are moving away from that thinking and are rejecting the incompatibility thesis. However, there is still a residue of scholars who still have a paradigmatic hangover that characterised the “paradigm wars”.

The idea of mixing the two paradigms emerged during the 1960s. Ever since, MMR has been prevalent in disciplines such as education (Johnson & Onwuegbuzie 2004), health (Morgan 1998), library and information science (Fidel 2008; Gorman & Clayton 2005; Onwuegbuzie, Jiao & Bostick 2004), nursing (Andrew & Halcomb 2007), sociology (Hunter & Brewer 2003) and program evaluation (Greene, Caracelli & Graham 1989), to mention a few. The rise of MMR as a third research approach heralded the end of the artificial tensions induced by ontologism, epistemologists and methodologists and the fall of walls erected between the qualitative and quantitative approaches. With the emergence of MMR, the concern about identity associated with qualitative and quantitative standpoints is gradually disappearing. The criticism of the dichotomy between qualitative and quantitative approaches was based on the grounds that research is complex and diversified in practice and cannot be perceived in terms of artificial compartmentalisation (Brannen 2005). But there are still some researchers who believe that pragmatism best describes the underlying paradigm behind MMR (Tashakkori & Teddlie 1998).

The argument is that mixed methods research should have its own paradigm as qualitative and quantitative procedures (Greene 2008). However, pragmatism cannot be regarded as a paradigm as it is mainly concerned with using whatever ‘works best’ in any research situation. Admittedly it is some form of methodological pluralism, but it falls short

of the basic tenets of MMR. Purpose and appropriateness of the research methods to answer the research question at hand rather than convenience and expediency dictate as to when mixed methods research may be used.

Between 1900 and 1959 anthropologists and sociologists employed both qualitative and quantitative approaches in their research (Johnson, Onwuegbuzie & Turner 2007:113). However, their research approach was not labeled as mixed methods research. In the mid-1990s the debate shifted from seeing the two standpoints as divided and separate to how the two paradigms might be linked in a single study. The idea of mixed methods research as it is known nowadays grew out of that debate (Creswell 2009:101). Mixed research design is not new, but MMR is a new movement or research paradigm. Researchers used to combine research approaches as follows (Creswell 1994:177):

- A two-phase design is whereby a qualitative and quantitative phase of the study is conducted separately. No attempt is made to link the two phases
- Dominant/less dominant design is whereby one of the designs (qualitative and quantitative) is chosen as the dominant approach. The other approach is merely a small component.
- Mixed methodology design is whereby all the aspects of methodological steps in both paradigms may be mixed.

It is not very difficult to see the reason why many scholars think that MMR is new if one closely looks at the typology of combining paradigms outlined above. All along researchers have been combining research approaches but the emphasis was not on using both qualitative and quantitative paradigms across all the stages of the research process. Hitherto the combining of the two approaches was confined to two-phase and dominant/less dominant designs without attempting to integrate them fully into all the phases of the research cycle. Many studies that used the two designs mentioned in the preceding sentence used methodological triangulation tools.

Triangulation as introduced by Campbell and Fiske (1959) was the first effort to formalise the use of multiple research methods. Subsequently, Denzin (1978:14) made a case for triangulation and posited that “the bias inherent in any particular data source, investigators, and particularly method will be cancelled out when used in conjunction with other data sources, investigators, and methods”. Methodological triangulation aims at seeking convergence, inconsistency and contradiction by investigating a research question from different vantage points. On the other hand, MMR focuses on fusing together qualitative and quantitative data and intertwining them.

Three distinctive types of mixed research strategies have emerged, namely (Creswell 2003; Hewson 2006):

- sequential strategies: qualitative data is collected and analysed before the quantitative data collection and analysis phase (or vice versa);
- concurrent methods: data is collected using both qualitative and quantitative procedures simultaneously (for example, administering a questionnaire which has both closed-ended and open-ended questions; and
- Transformational techniques: using a theoretical perspective to guide and drive the entire study design.

Other scholars have added the level of mixing and the weight given to each approach to this typology (Leech & Onwuegbuzie 2009). The weight given to each approach will differ from researcher to researcher and from study to study. The mixing can occur at any stage of the research. It may also occur throughout the research cycle, that is, philosophical assumptions, research question formulation, data collection, data analysis and inference stages of the research process.

### **3 Mixed research methods: reading from the same page**

Terms such as blended research, hybrid research methods, integrative research, multimethod research, multiple methods, triangulated studies, ethnographic residual analysis and mixed research (Johnson, Onwuegbuzie & Turner 2007:118) kept cropping up in the literature before MMR was widely adopted to describe the emerging research paradigm. Although the use of MMR is growing in popularity in many disciplines (Andrew & Halcomb 2007:145; Johnson, Onwuegbuzie & Turner 2007:112; Niglas 2009:34; Teddlie & Tashakkori 2003:3), MMR scholars still do not seem to agree on many basic issues related to the approach. Defining the nature of MMR is one of the unresolved issues in the MMR discourse (Tashakkori & Creswell 2007:4). Many definitions have been put forward to describe MMR. Table 1 gives a list of some definitions selected from extant literature.

**Table I** Selected definitions of mixed methods research (MMR)

Definition of mixed methods research	Author(s)
MMR is defined as “a combination of at least one qualitative and one quantitative component in a single research design, aiming to include the benefits of each method by combining them”	Bban (2008:339)
MMR comprises “qualitative and quantitative methodologies for both data collection and analysis”	Bahl & Milne (2006:198)
“The term ‘mixed methods’ has developed currency as an umbrella term applying to almost any situation where more than one methodological approach is used in combination with another, usually, but not essentially, involving a combination of at least some elements drawn from each of qualitative and quantitative approaches to research”	Bazeley (2008:133)
MMR studies “report both qualitative and quantitative research and include both approaches in the data collection, analysis, integration, and inferences drawn from the results”	Creswell & Tashakkori (2007:108)
MMR is the “combination of both quantitative and qualitative methodologies within the same study in order to address a single research question”	Hewson (2006:179)
MMR “is the type of research in which the researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative view points, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration”	Johnson, Onwuegbuzie & Turner (2007:123)
MMR ‘is an intellectual and practical synthesis based on qualitative and quantitative research; it is the third methodological paradigm (along with quantitative and qualitative research)”	Johnson, Onwuegbuzie & Turner (2007:129)
MMR “involves collecting, analyzing, and interpreting quantitative and qualitative data in a single study or in a series of studies that investigate the same underlying phenomenon”	Onwuegbuzie & Leech (2006:474)
MMR is an inquiry “in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or programme of inquiry”	Tashakkori & Creswell (2007:4)
“Mixed methods combine qualitative and quantitative approaches in the methodology of a study (such as in the data collection stage), while mixed models studies combine these two approaches across all phase of the research process (such as conceptualization, data collection, data analysis and inference)”	Tashakkori & Teddlie (1998:ix-x)

The common denominator of the ten definitions outlined in Table I is that MMR mixes qualitative and quantitative approaches to conduct an inquiry. That means that the definitions are converging and eventually we may have to settle down for the following definition of MMR:

Mixed methods designs are those that integrate quantitative and qualitative approaches in a single study or a multi-phased study, comprising the following five specific designs: sequential studies, parallel/simultaneous studies, equivalent status designs, dominant-less dominant designs, and designs with multilevel use of approaches wherein researchers utilize different techniques at different levels of data aggregation (Leech & Onwuegbuzie 2009:273).

#### 4 Rationale behind the use of mixed research methods

Researchers do not apply MMR simply for the sake of it or the joy of mixing. Rather, they use MMR to bridge the gap between qualitative and quantitative paradigms in order to answer research questions holistically. The rationales for using a combination of qualitative and quantitative methods have been profiled by Collins, Onwuegbuzie and Sutton (2006) as:

- participant enrichment (for example, increasing the number of participants);
- instrument validity and reliability (for instance, pretesting and piloting the study);
- treatment integrity (that is, assessing the reliability of interventions and programmes); and
- significance enhancement (enriching the researcher’s interpretation of data).

The three authors also identified 65 purposes for mixing qualitative and quantitative procedures. However, each of the 65 purposes relate to the four grounds for using mixed research methods that are outlined in the preceding paragraph. The framework provided by Collins, Onwuegbuzie and Sutton (2006) is useful in evaluating the rationale behind MMR studies, but we preferred the scheme suggested by Greene, Caracelli and Graham (1989) as partially recommended by Onwuegbuzie and Leech (2006:480) and Leech and Onwuegbuzie (2009:274), and successfully used by Crump and Logan (2008).

The five purposes of using MMR suggested by Greene, Caracelli and Graham (1989) are triangulation, complementarity, development, initiation and expansion.

- Triangulation seeks convergence and corroboration of findings through the use of more than one method of gathering and analysing data about the same phenomenon in order to eliminate the inherent biases associated with using only one method (Babbie 2004; Crump & Logan 2008; Johnson, Onwuegbuzie & Turner 2007; Onwuegbuzie & Leech 2006). For instance, the inherent bias in particular data sources, investigator, and method may be neutralised when used in conjunction with other data sources, investigators and methods (Creswell 1994:174; Denzin 1978:14). The main aim is not to demonstrate that different data sources or inquiry approaches yield essentially the same results. Instead, the objective is really to test for consistency in the findings (Patton 2002:248).
- Complementarity aims at amplification and enhancement of the results from one research approach with the results from another methodology using different phenomena (Johnson, Onwuegbuzie & Turner 2007).
- Development uses results from one stage of research in a sequential design to inform the development of the methods for the subsequent stage. For instance, focus group interviews may be used to develop instrumentation to investigate the same phenomenon.
- Initiation seeks contradictions and new perspectives in order to find out why such inconsistencies and paradoxes exist.
- Expansion aims at extending breadth and scope of an investigation employing different methods for various components of the research.

The use of multiple perspectives is fundamental to the mixed methods research (Greene 2007). The deconstruction of terms in mixed methods, such as *mixing* may also shed more light into the dynamics of using mixed methods research. We leave that debate to postmodernists and others as we are going to concentrate on the essence of the "research paradigm whose time has come" (Johnson & Onwuegbuzie 2004). The debate may rage on, but we are convinced that MMR is a third research paradigm that must be given a chance, especially in LIS research in South Africa. Further, the argument over whether or not the methods are mixed or integrated or blended is no longer useful as it does not take us very far (Bryman 2005).

## 5 Statement of the problem and research questions

Valid knowledge in the field of LIS is likely to be produced by researchers that conform to balanced methodologically procedures. The use of mixed research methods offers an opportunity for researchers to counterbalance the biases, limitations, and weaknesses of either qualitative or quantitative research approaches. Yet, studies that probe the research methods used by LIS researchers in South Africa are very limited. Insights gained from such a study would assist future LIS researchers to appreciate the use of MMR in generating results which are dependable and valid. The assumption is that MMR provides the researchers an opportunity to explore a subject from a vantage point. The primary research questions that guided the study were:

- What are the trends in the use of research methods in the LIS journals in South Africa?
- How prevalent is the use of MMR in LIS research in South Africa?
- What was the purpose of using mixed methods research?
- At what stage of the study was the mixing typically applied?
- What is the level of mixing that is evident in LIS research in South Africa?

## 6 Methodology

The research employed content analysis to determine the extent to which information science researchers in South Africa used MMR in their contribution to knowledge in the field. We chose the time period from 2002 to 2008 because we were interested in assessing the recent and current practices and to gauge the progress that has been made over the years. LIS journals were selected based on four of the following criteria:

- Annotated or indexed or abstracted in the *Index to South African Periodicals*, *Library and Information Abstracts*, *African Journals Online*, *SABINET database* and *Index to South African Literature on Library and Information Science*;

- Be accessible online (full text);
- Have been continuously published in South Africa for more than 3 years during the period under review; and
- Should be accredited by the Department of Education in South Africa.

Using the above criteria the following six journals were identified: *ESARBICA Journal: Journal of the Eastern and Southern Africa Regional Branch of the International Council on Archives*, *Indilinga: African Journal of Indigenous Knowledge Systems*, *Innovation: Journal of Appropriate Librarianship and Information Work in Southern Africa*, *Mousaion: South African Journal for Information Studies*, *South African Journal of Information Management (SAJIM)* and *South African Journal of Libraries and Information Science (SAJLIS)*. Table 2 gives a summary of all the articles that were analysed.

**Table 2** Summary of the articles that were studied

Year	ESARBICA	Indilinga	Innovation	Mousaion	SAJIM	SAJLIS	Total
2002	21	11	14	13	12	11	82
2003	8	22	13	11	11	10	75
2004	10	22	17	13	16	12	90
2005	10	35	17	13	22	16	113
2006	10	16	18	12	19	12	87
2007	7	16	13	15	13	15	79
2008	10	19	12	15	15	16	87
<b>Total</b>	<b>76</b>	<b>141</b>	<b>104</b>	<b>92</b>	<b>108</b>	<b>92</b>	<b>613</b>

Content analysis was used to identify the distribution of research strategies and techniques reported in the selected journals. Content analysis has been utilised to determine the extent to which scholars used mixed methods research (Bryman 2005; 2006; 2007; Crook *et al.*, 2009; Greene, Caracelli & Graham 1989; Leech & Onwuegbuzie 2009). Content analysis was also used by Hider and Pymm (2008) and Järvelin and Vakkari (1990) to investigate the research methods reported in LIS journal literature. We examined all the 613 journal articles that were identified. Our approach comprised three steps. First, we manually identified the research strategies employed in all the journal articles. Secondly, we selected the articles that utilised MMR. Lastly, based on the typology of evaluating MMR studies proposed by Creswell and Plano Clark (2007), the articles were scrutinised to:

- decide whether mixed methods were used;
- identify the mixed research purpose statement, research question, type of mixed method design and data analysis; and
- establish whether the study's author(s) present information regarding challenges that may have arisen during the study (for example, unequal sample sizes, how participants were selected, and the steps taken throughout the study).

Leech *et al.* (2009) acknowledged that these points are worth considering when evaluating MMR studies even if they are very broad in scope.

The number of articles identified for the study was considered to be sufficient given that Järvelin and Vakkari (1990) analysed 449 articles. On the other hand, Hider and Pymm (2008) examined 567 articles from what they considered to be high-profile journals. The research articles were classified into categories using the typology suggested by Hider and Pymm (2008) and Järvelin and Vakkari (1990). In the final analysis the categories used were strategy (for example, historical research and survey), data collection technique (for example, questionnaires and interviews), and types of analysis (for instance, qualitative, quantitative and/or mixed).

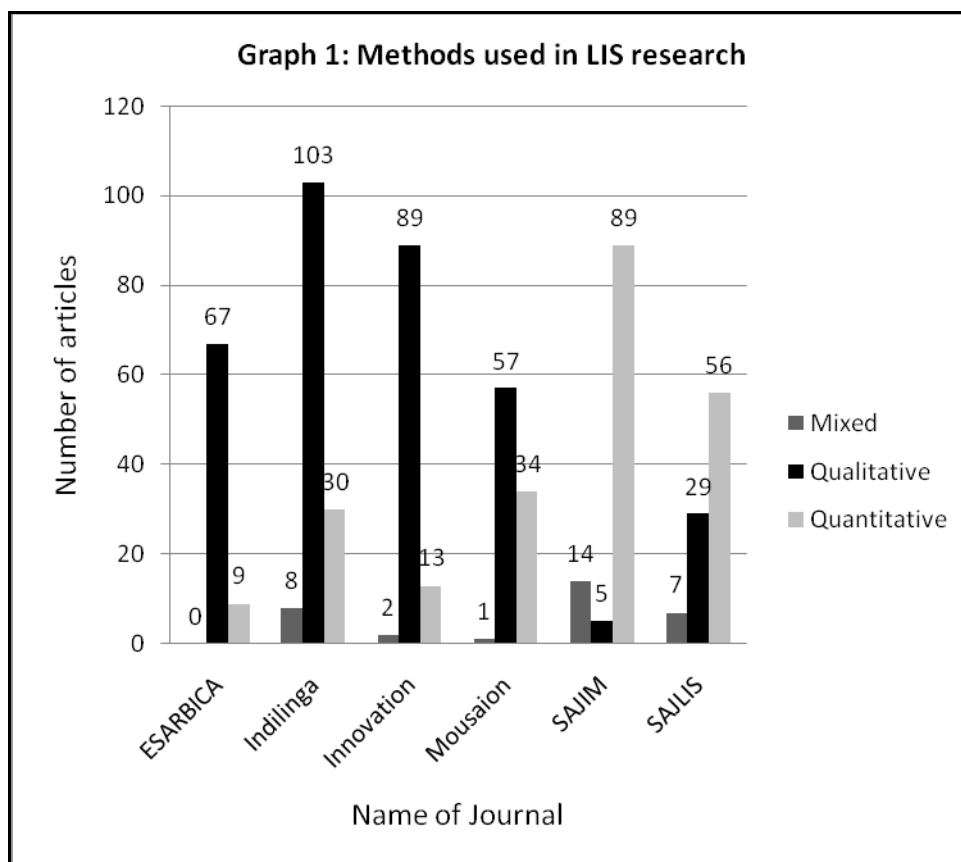
We do acknowledge that content analysis is a partial and crude indicator of the prevalence of MMR in LIS research in South Africa. The current research could have benefited from a mixed methods research approach as the one used by (Crook *et al.*, 2009). Interviews of purposively selected participants might have helped the study to determine the reasons why LIS researchers in South Africa did not widely utilise MMR. That being said, we shall leave to others that interpretive study as the major objective of the current study is to provide a sketch of the use of MMR in the LIS landscape in South Africa with the hope of stimulating more granular investigations. That fact should be borne in mind when looking at the data presented here.

## 7 Results and discussion

This section discusses the trends in the use of research methods in the LIS journals in South Africa. Secondly, it presents the incidence of the use of MMR in LIS research in South Africa. Thirdly, the purpose why the studies used mixed methods research. Fourthly, the phase at which the studies applied the mixing is described. Lastly, the level of mixing that is evident in LIS journals in South Africa is presented.

### 7.1 Trends in the use of research methods in the LIS journals in South Africa

Studies that were investigated fall on a continuum from mono-method designs to partial mixed methods. The reasons why we posit that the articles used partial mixed methods will be explained in section 7.5. Graph 1 gives a summary of the research methods that were used in the articles that were examined. It is evident from Graph 1 that qualitative strategies were the front-runner in the journals that were analysed. Mixed method research was at the tail and SAJIM is leading the pack of the journals that employed mixed research methods. Qualitative approaches accounted for 57.1% (350), while the incidence of quantitative and mixed methods research was 37.7% (231) and 5.2% (32) respectively. The journals that mostly used qualitative methods were *ESARBICA*, *Indilinga* and *Innovation*. On the other hand, the journals that mostly used quantitative approaches were *SAJIM* and *SAJLIS*.



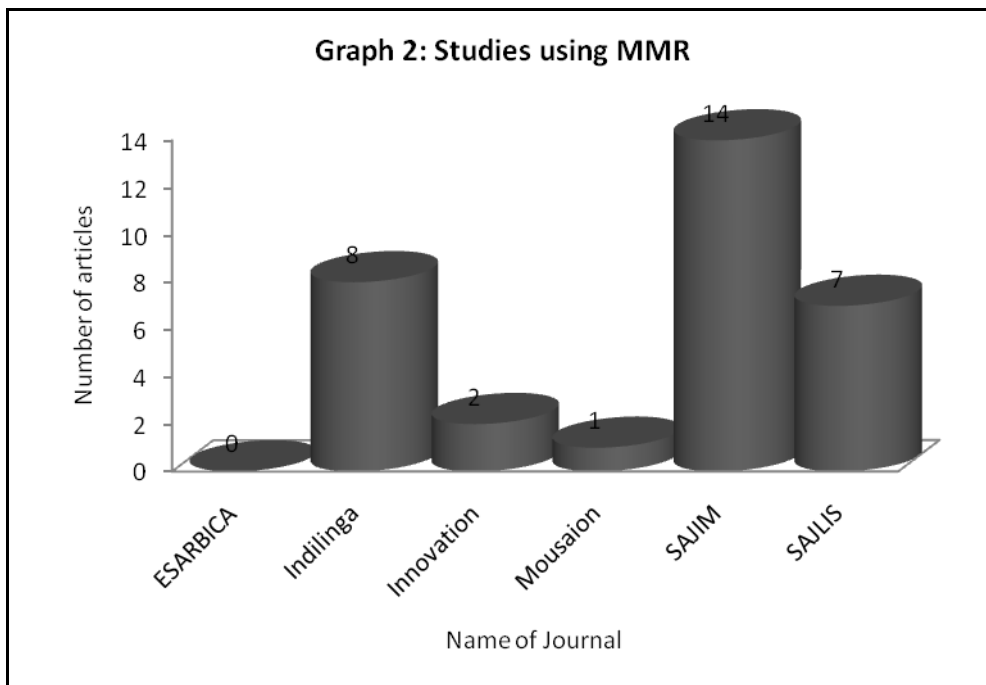
The research strategies that were used within each paradigm are summarised in Table 3. *SAJIM*, *SAJLIS* and *Indilinga* used a variety of research strategies. Historical research seemed to be prevalent followed by the survey research design.

### 7.2 Prevalence of the use of MMR in LIS research in South Africa

Although scholars are not agreed as to what constitutes the nature of mixed methods (Creswell & Tashakkori 2007), we depended on typologies provided in the literature (Creswell *et al.*, 2003; Greene, Caracelli & Graham 1989; Leech & Onwuegbuzie 2009) to determine whether or not the designs that were employed were MMR or not. No article out of the 32 that were classified as having employed MMR explicitly used the term mixed methods or mixed methodology to describe the research strategy employed in the inquiry. Graph 2 shows that *SAJIM* (43.8%), *Indilinga* (25%) and *SAJLIS* (21.9%) researchers used mixed methods research more than scholars publishing in the other journals. *Innovation* and *Mousaion* accounted for 9.3% of the researches using MMR. Scholars who published in the *ESARBICA* Journal did not use MMR designs.

**Table 3** Research strategies employed by the articles

Strategy	ESARBICA	Indilinga	Innovation	Mousaion	SAJIM	SAJLIS
Historical research	67	81	89	57	4	29
Ethnography	-	22	-	-	-	-
Grounded theory	-	-	-	-	1	-
Survey	9	12	10	24	61	33
Case or action research	-	10	3	7	15	2
Content or protocol analysis	-	5	-	-	8	5
Bibliometrics or informetrics	-	1	-	2	-	11
Secondary analysis	-	-	-	-	3	-
Experiment	-	2	-	1	2	5
Mixed strategies	-	8	2	1	14	7
<b>TOTAL</b>	<b>76</b>	<b>141</b>	<b>104</b>	<b>92</b>	<b>108</b>	<b>92</b>



Further, the researchers did not recount any stories about the challenges they might have encountered using mixed method research. Some of the challenges that are likely to be encountered by MMR researchers reported in the literature include, unequal sample sizes, selection of participants and steps for conducting the whole research (Creswell & Plano Clark 2007). The lack of reports on these issues in the articles that were evaluated might be indicative of the low appreciation of the challenges that MMR designs are associated with on the part of the researchers.

Twenty seven out of thirty two researchers used the concept of triangulation to justify their use of more than one method in their studies. Based on the information from Creswell *et al.*, (2003) their studies might be classified as “sequential triangulation method designs”. In other words, the qualitative and quantitative components of the studies occurred one after the other with the initial phase informing the next. However, Onwuegbuzie and Collins (2007) doubt the appropriateness of sequential designs for triangulation purposes. The argument is that if qualitative or quantitative data are collected first, the “findings from the first approach might influence those from the second approach, thereby positively biasing any comparisons” (Onwuegbuzie & Collins 2007:291).

Triangulation with its emphasis on investigating a research question from more than one vantage point in order to improve or validate the accuracy of the findings is rather a narrow and specific aspect of MMR. Unlike triangulation that uses two perspectives to see “reality” more accurately, the emphasis in MMR is on the combination and integration of



more than one research strategy in a single study. That means that MMR enjoys a research design position superior to methodological triangulation.

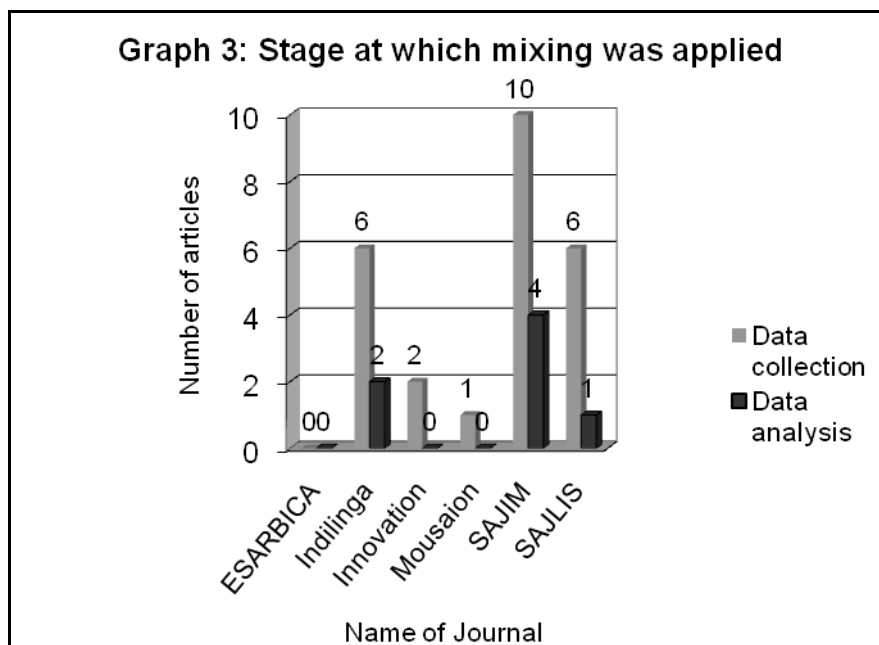
### 7.3 Purpose of using mixed methods research

According to Teddlie and Tashakkori (2009) the reasons why researchers use MMR in their studies is a matter that needs further investigation. The 32 studies that were evaluated did not clearly state the rationale and purpose of mixing qualitative and quantitative paradigms. Failure to articulate the grounds for mixing qualitative and quantitative approaches is not unique to South Africa as over a quarter (27%) of the articles analysed by Bryman (2005) in the United Kingdom provided no rationale for mixing. The purpose of using more than one research method by the articles that we investigated seems to have been motivated by the desire to produce a consistent version of the subject of study. This purpose partly falls under triangulation, that is one of the five purposes of MMR suggested by Greene, Caracelli and Graham (1989) [see section 4].

### 7.4 Stage of the study where the mixing was applied

There has been a lot of debate surrounding the nature of mixing or integration in MMR (Bryman 2005; 2007). The argument is that mixed methods research should go beyond reporting the use of two methodologies. The research should link and integrate the research methods too to provide a comprehensive understanding of the research question under investigation (Bryman 2007). Three quarters of the studies used the sequential qualitative-quantitative design. The qualitative element of the research assisted in identifying items for the questionnaire before the data collection phase. The findings and inferences from the initial qualitative stage that usually provide the basis for questionnaire construction were not discussed in detail in the articles that were reviewed. Based on the MMR design typology of Greene, Caracelli and Graham (1989), we were going to conclude that the reason why the studies used the qualitative approach before the quantitative paradigm was for 'development' if the researchers had unequivocally stated that the results from the initial qualitative phase were used to develop methods for the following phase.

Graph 3 shows that the majority of the studies used both qualitative and quantitative approaches during data collection. Questionnaires and interviews were the dominant methods of data collection that were used. However, data analysis was based on one method only.



By and large, there was a "co-presence of multiple methods, rather than their integration" (Mason 2006). Some data from one of the approaches seemed to have fallen through the cracks as the data was analysed. Reporting both qualitative and quantitative data when presenting the findings of an inquiry was identified as one of the problem areas by Bryman (2007). Greene, Caracelli and Graham (1989) found that 44% of the 57 articles they examined did not integrate data from the two paradigms utilised in the study. Eighteen percent of the 232 MMR articles published between 1994 and 2003 fully integrated the qualitative and the quantitative findings (Bryman 2006). The articles we examined only partially integrated the findings from both paradigms that were employed.

According to Bryman (2007:21), more attention needs to be given to the integration of findings from qualitative and quantitative studies. Thus, “mixed methods research should be judged by the degree or way in which the different components are integrated” (Bryman, Becker & Sempik 2008:273). Mixing should be evident in the way the data are analysed and presented. An integrated MMR study is the one where:

Quantitative and qualitative components can be considered “integrated” to the extent that these components are explicitly related to each other within a single study and in such a way as to be mutually illuminating, thereby producing findings that are greater than the sum of the parts (Woolley 2009:7).

Finally, the researchers should be “prepared to fully use the opportunities for integration that their data present to them” (Bazeley 2009:206). The bottom line is that researchers should integrate the qualitative and quantitative data for their research to be regarded as MMR design.

#### 7.5 Level of mixing that is evident in LIS research in South Africa

According to Leech and Onwuegbuzie (2009:268) the level of mixing refers to whether the mixed research is partially mixed or fully mixed. The mixing may be done concurrently or sequentially. This also relates to the weight given to each paradigm in the research process.

First, only one study used a fully mixed design as characterised by Leech and Onwuegbuzie (2009:267). The majority of the studies partially used the mixed methods design. The studies did not mix qualitative and quantitative tools within or across the research phases. For research to be regarded as having a fully mixed design it must use research objectives from both quantitative and qualitative approaches for the purpose of exploring and predicting, collecting and analysing data, and making of inference (Leech & Onwuegbuzie 2009:267).

Second, the paradigms were not given equal weight in the articles that were analysed. The researchers used “partially mixed sequential dominant status” (Leech & Onwuegbuzie 2009:270). The studies that we examined were conducted sequentially but data interpretation was confined to one paradigm. Research approaches were never given an equal status as one was dominant than the other. The qualitative approach represented the dominant phase of all the articles that were analysed and in three quarters of the times they had a quantitative slant.

Third, the articles that were evaluated did not show how the quantitative findings enriched the qualitative ones (or vice versa). For instance, “results from qualitative interviews can help to identify unobserved heterogeneity in qualitative data as well as previously unknown explaining variables and misspecified models”; and “results from the qualitative part of mixed methods design can help to understand previously incomprehensive statistical findings” (Kelle 2005).

### 8 Recommendations and conclusions

The findings suggest that LIS researchers in South Africa mostly rely on qualitative methodologies. The findings show the limited use of mixed methods research by LIS scholars in South Africa. In the studies that used MMR, mixing of methods was more prevalent during data collection than analysis and inference. Researchers who used MMR vaguely alluded to the reasons why they used the approach. The purpose of using MMR was triangulation, one of the rationales of using MMR designs advanced by Greene, Caracelli and Graham (1989). The other grounds for using MMR designs provided by these three authors were not evident in the articles that were examined. Further, a large proportion of articles that were examined either did not integrate the methods, or did it in a limited way. The findings are not surprising because there are relatively few well-known exemplars of MMR designs in LIS in South Africa to direct scholars in the use of the emerging research design (cf Bryman 2007).

Mixed methods research provides an opportunity for LIS researchers in South Africa to obtain a variety of information on the same issue; use the strengths of each method to overcome the deficiencies of the other; achieve a higher degree of validity and reliability; and overcome the deficiencies of single method studies (Sarantakos 1998:295). In that regard, researchers should make mixed methods research happen by researching and publishing works which combine or integrate methods.

MMR has tremendous potential of fostering teamwork and collaboration in LIS research in South Africa. It is very rare to get researchers who are really good in both qualitative and quantitative approaches. In that regard, researchers with a qualitative orientation may team up with quantitative specialists to research the same phenomenon in order to enhance the richness of data obtained. However, working in such research teams is not without its own challenges. Teams have to carefully negotiate and navigate disciplinary or theoretical differences and individuals’ status, power, money and interests. Therefore it’s important to have an agreement from the beginning on how teams from diverse research backgrounds will integrate their experiences, methods, approaches and theories and work harmoniously in a research project. In other words, that requires:

considerable skill and commitment from researchers and teams, who need to have the capacity and inclination to see beyond disciplinary, epistemological and ontological distinctions, without simply wishing to critique all others from the perspective of only one, or to subsume all others into one (Mason 2006:10).

The same sentiments are echoed by Bryman (2007), Creswell and Garrett (2008) and participants in a workshop at the University of Manchester (Dale 2005).

Finally, some people may say that mixed methods research is not new as it has been used for many years by anthropologists and sociologists, for instance. In response we would say that nowadays the emphasis has shifted from using qualitative and quantitative approaches *per se* to integrating the two standpoints throughout the whole research process. In essence, mixed methods research is more than collecting two or more types of data. In line with MMR, research methods designs should be used by researchers in the LIS field in South Africa to collect and analyse data, integrate the findings and draw inferences using both qualitative and quantitative methods if they are to truly become part of the third “research paradigm wave” or “third methodological movement” as Creswell and Garrett (2008) and Teddlie and Tashakkori (2003) prefer to call it.

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