Afr. J. Lib. Arch. & Inf. Sc. Vol.22, No. 2 (2012) 117-132

Mapping Mixed Methods Research in Library and Information Science Journals in Sub-Saharan Africa, 2004 – 2008

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Abstract

This article explores the use of mixed methods research (MMR) in articles published in library and information science (LIS) journals in Sub-Saharan Africa (SSA) from 2004 to 2008. Mixed methods research entails using multiple observers, theories, methods, and data sources in a single study, thereby enabling the different methods to beneficially corroborate or validate one another. The MMR framework provided in the methodological literature was used to determine how this method was practised within the LIS scientific community in SSA. Six hundred and eighty five articles published in nine peer-reviewed LIS journals in SAA were analysed. The study found out that most of the articles used only survey designs or historical research methods. Only 48 out of the 685 articles (seven per cent) used MMR approaches, which is clearly limited and inadequate. The study recommends a paradigm shift and a change in the mindset of LIS researchers in SSA in order to be able to exploit the advantages offered by MMR.

Keywords

Research methodology, Mixed Methods Design, Library and Information Science, Research paradigm

Introduction

The library and information science (LIS) discipline is fast becoming popular in Sub-Saharan Africa (SSA). This is evidenced by the number of universities offering courses in LIS, the various existing associations in that field in many countries, and the plethora of published LIS journals, monographs, chapters in books, patents, reports, and conference papers and proceedings through which LIS researchers in SSA have contributed to the global LIS literature.

Research and scholarly communications are fundamental to the scientific growth of a field. The evolution of a discipline partly hinges on the development of the field's theory and the field's research methods. The latter is the focus of this article. Confidence in the conclusions drawn from research within a field can only be strong if sound methodological practices underline the research (Ketchen, Boyd and Bergh, 2008). Whether or not a fuller picture of the phenomenon being researched can be portrayed depends on the methodology that is used in the inquiry.

Until recently, researchers have been dogmatically using either the qualitative or quantitative methods to understand social phenomenon in a mono-method mode. The dichotomy in the perspectives is understandable if we accept that a paradigm refers to an "accepted model or pattern" (Kuhn, 1962:23). Paradigms are human constructions that tend to be prescriptive and exclusive. They have a tendency to constrain intellectual curiosity and innovation as templates do. These research perspectives or 'templates' can be further categorised as constructivist and post-positivist respectively.

The differences in the knowledge claims of the constructivists and post-positivists led to what has been described as paradigm "wars" or the

incompatibility and purist debate. Energies were spent on fostering the qualitative and quantitative divide. The argument was that the two worldviews were based on different ontological (nature of reality), epistemological (nature of knowledge), axiological (values in inquiry) and methodological (process of research) assumptions which rendered the two paradigms incompatible. For instance, one of the arguments to support this stance was that the belief in a round world precludes belief in a flat one. The adversaries in the paradigm "wars" needed to be reminded that there is no bullet-proof design. Consequently, the approach to research epistemologies should be flexible and pragmatic. All research methods have strengths and weaknesses. Indeed, the pragmatists provided that reminder, and they turned out to be the peacemakers in the paradigm "wars" (Creswell and Plano Clark, 2007).

In the long run, researchers began to realise that qualitative and quantitative methods were not diametrically opposed and divergent to each other as they imagined; instead, they complemented and strengthened each other giving the possibility of obtaining a comprehensive picture of social phenomenon. It became futile to fight over the incommensurability between constructivism and objectivism because it became clear that, "the (constructivist account) may deny the reality of the very phenomena that the objectivist account seeks to understand" (Bryman, 2007:16).

Nowadays, there is a strongly held view that bringing together both quantitative research and qualitative research so that the strengths of both approaches are combined leads to a better understanding of research problems than either approach alone (Creswell and Garrett, 2008). However, there is no significant discourse around the use of mixed method research (MMR) in the LIS research discourse in SSA.

Trends, pressing issues and challenges in a discipline may be identified through an analysis of the discipline's journals overtime. In fact, one of the most meaningful ways to examine the state of affairs of journals and understand the development of a research area is an analysis of articles (Williams and Buboltz, 1999). Creswell and Garrett (2008) have also suggested that journals are one of the indicators that may be used in measuring the extent of the growth of MMR in a discipline. Furthermore, the trend to examine the prevalence rates of methodological approaches within the social sciences is a new area of research that has "emerged in mixed methods (MM) over the past 5 years" (Alise and Teddlie, 2010:103).

Content analysis of LIS journals published in Africa is not a new phenomenon. Previous analyses examined various trends over time. The choice of the journals and the period analysed seem to have depended largely on the availability of a dependable database. Ocholla and Ocholla (2007) analysed 157 LIS journals published between 1993 and 2006 to measure the research output generated by scholars in South Africa and demonstrated that the use of *Library and Information Science Abstracts* and Web of Science in conducting citation analysis of LIS research output emanating from Africa is counterproductive as most LIS journals are not indexed in these databases. For instance, the only LIS journal published in SSA indexed in the Web of Science is the *African Journal of Library, Archives and Information Science (AJLAIS)*, having only been included in 2007.

Manda (2002) reviewed the state of research methodology in African librarianship through a content analysis of journal articles published in AJLAIS between 1991 and 1999 and concluded that quality of research methodology and consequently the entire research process in African librarianship require major improvements. Similarly, Ngulube, Mokwatlo and Ndwandwe (2009) evaluated articles that were published in six South African journals during the period 2002 and 2008 to determine the research strategies they used and identified the lack of methodological pluralism in conducting LIS research in South Africa as being problematic.

The purpose of this study is similar to Manda's (2002) in terms of its focus on the relative uses of different research methodologies in published LIS articles, but differed from it in two other respects. Firstly, this study investigated the use of different research methodologies in a wider sample of LIS journal articles in SSA. Secondly, this study focused specifically on the use of MMR in the articles. Specifically, the purpose of this study was to: perform a comprehensive analysis of all articles published in leading LIS journals published in SSA between 2004 and 2008; examine the research methodology used in the articles in order to identify the frequently used

methods; and investigate the characteristic of the articles that used MMR, the purposes of mixing and the degree of integration achieved.

Following Hider and Pymm (2008), Järvelin and Vakkari (1990) and Ngulube, Mokwatlo and Ndwandwe (2009), this study used refereed journal articles instead of monographs and other vehicles of scholarly communication to analyse research trends in SSA. It is conceded that peer-reviewed journals constitute the main method of promoting scholarly communication. However, published journals in many disciplines constitute an important vehicle to disseminate ideas, knowledge, and content deemed necessary for the promotion of insights important to a given profession. Put differently, the published refereed journals of a discipline publish a significant portion of its scientific knowledge.

Mixed Methods Research (MMR)

Nature and Antecedents of MMR

The use of mixed methods research is growing in popularity in many disciplines, but there has been limited collective understanding of what constitutes MMR from the time it was popularised until recently (Creswell and Plano Clark, 2007). The variance in definitions is partly accounted for by the diversity of views and backgrounds of the scholars engaged in MMR. Table 1 summarises some of the definitions that were arbitrarily selected from the literature to illustrate the point.

Even if the definitions in table 1 explain MMR in varying degrees, the emphasis is on the use of multiple research methods and philosophical assumptions when conducting research. The views of the scholars are converging on the fact that MMR involves collecting, analysing, integrating and interpreting qualitative and quantitative data concurrently or sequentially in a single study or in a series of studies investigating the same problem irrespective of whichever research methodology is dominant in order to exploit the benefits of combining them and enhancing the validity of the findings.

Table 1: Selected definitions of mixed methods research (MMR)

Definition of mixed methods research	*Author(s)*
"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 at least some elements drawn from each of qualitative and quantitative approaches to research."	Bazeley (2008:133)
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)
A MMR study "involves the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research."	Creswell, Fetters and Ivankova (2004:7)
Mixed methods designs are "those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words)."	Greene, Caracelli and Graham (1989:256)
"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 combine 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 and Turner (2007:123)
"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 and Onwuegbuzie (2009:273)
"Mixed methods research combines theoretical and/or technical aspects of quantitative and qualitative research within a particular study."	Rocco *et al.*, (2003:19)
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)

There are competing claims for the origins and the use of MMR. More than 50 years ago, Campbell and Fiske (1959) advocated the use of multiple methods in measuring a psychological trait. Denzin (1978; 1989) developed the idea further and came up with the concept of triangulation. According to Denzin (1989:307):

> By combining multiple observers, theories, methods, and data sources, [researchers] can hope to overcome the intrinsic bias that comes from single-methods, single –observer, and single-theory studies.

In that sense, combining methods in a single study is not new. The argument is that some scholars have been using closed question items (quantitative) and open-ended items (qualitative) in one questionnaire for a single or series of studies, and that constituted MMR. Ethnographers also lay a claim to having been employing MMR as they were used to collecting both qualitative (e.g. through interviews) and quantitative data (e.g. surveys) when conducting research. These claims were based on the classical triangulation model or meta-analysis tradition of juxtaposing qualitative and quantitative approaches when conducting research and synthesising the results at a later stage. However, they did not conceptualise "mixed methods as a distinct approach of inquiry" (Creswell and Garrett, 2008).

Although previous attempts at employing multiple methods when conducting research were not called or labelled MMR, they form the basis of MMR. In triangulation, the 'mixing' is at a methodological or application level (i.e. collecting, analysing and interpreting data) and seeks convergence, whereas MMR moves beyond techniques and methods as it encompasses all the phase of the research process including the philosophical assumptions and the research question (Teddlie and Tashakkori, 2009), and is open for divergence (for an elaborate discussion, see Hammersley, 2008). The new dynamics of 'mixing' or combining research methods has changed resulting in a third distinct and recognized research paradigm that may be labelled MMR (see Creswell and Garrett, 2008). As the mythological phoenix, MMR research has become the third methodological movement along qualitative and quantitative research (Cameron, 2009).

It is apparent that the purpose of 'mixing' in MMR is multifaceted while the major purpose of triangulation, in the classical sense, is to check for

inconsistency rather than to achieve the same result using different data sources (Patton, 2002). For instance, in triangulation, interviews may be used to confirm results obtained through the use of another method, whereas in MMR, in-depth interviews are designed to explore in more detail the findings from a survey, for example.

Types of Mixed Method Designs

A variety of mixed methods research designs have been developed. Although there are many types of MMR design, their mere existence provides researchers with a framework to design and to implement studies, and a lexicon to utilise when interpreting and disseminating research findings (Teddlie and Tashakkori, 2009). However, there is a high degree of overlap among the types of mixed methods designs. According to Cameron (2009), the most popular typologies of mixed method designs are the following:

i. Caracelli and Greene (1997) typology included three component designs (triangulation, complementary and expansion) and four integrated designs (iterative, embedded/nested, holistic and transformative);

ii. Teddlie and Tashakkori (2003) six types of multi-strand - mixed method and mixed model study with procedures that are concurrent, sequential and conversion; and

iii. Creswell and Plano Clark (2007) four types of designs (triangulation, embedded, explanatory and exploratory).

All the mixed method research design typologies suggested in the literature are useful in evaluating the rationale behind MMR studies, but we prefer the framework suggested by Greene, Caracelli and Graham (1989) as partially recommended by Onwuegbuzie and Leech (2006) and Leech and Onwuegbuzie (2009), and successfully used by Ngulube, Mokwatlo and Ndwandwe (2009). The five purposes of using MMR suggested by Greene, Caracelli and Graham (1989) after reviewing 57 mixed methods studies 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 analyzing data about the same phenomenon in order to eliminate the inherent biases associated with using only one method (Johnson, Onwuegbuzie and Turner, 2007; Onwuegbuzie and Leech, 2006).
- Complementarity aims at amplification, illumination and enhancement of the results from one research approach with the results from another methodology using different phenomena (Johnson, Onwuegbuzie and Turner, 2007).
- Development employs results from one research methods to inform the other. 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 intends to extend the breadth and scope of an investigation employing different methods for the different components of the investigation.

Research Problem and Questions

Confidence in the knowledge claims and conclusions drawn from research within a field largely depends on the soundness of the research methods used by the practitioners of the discipline. There is mounting evidence that, "A field is strengthened when its researchers show an awareness of the weaknesses and strengths" of qualitative and quantitative approaches (Rocco *et al.*, 2003: 23). The use of mixed methods research acknowledges that both qualitative and quantitative methods offer a one-sided glimpse of the social world, and suffer from certain shortcomings that may be overcome by combining the advantages of both methods in answering a research question. Thus, the use of multiple methods increases the overall confidence in the findings of a study. Yet, studies investigating research methods used by LIS practitioners who contribute to journals published in SSA are very limited.

The assessment of the research trends and methods used in journals may provide evidence on the use of MMR research, and data to guide changes in editorial policy and practice intended to attract articles based on balanced and appropriately integrated rigorous research. MMR with its emphasis on the use of multiple methods to effectively address all the facets of a research problem offers an opportunity to LIS research in SSA to depict the complexities and "messiness" of social phenomenon with empirical rigour and credibility.

There is also a desire that this study might stimulate debate around MMR, and serve as model for similar journal assessments in the field of information science in SSA. Five primary research questions guided the study:

- What are the trends in the use of research methods in the LIS journals in SAA?
- How widespread is the use of MMR in LIS research in SAA?
- What was the purpose of using mixed methods research?
- What kind of mixed methods designs did they use?
- What is the degree of integration of qualitative and quantitative components?

Methodology

A sample of nine journals from a possible sixteen in the relevant population was identified (see table 2). The seven journals that were excluded had 140 articles available online between them. LIS journals were selected on the basis of being peer-reviewed and indexed or abstracted in *AJOL* and *Ulrich's Directory of International Periodicals (UDIR)*. These indices were used in order to get a relatively comprehensive picture of LIS journal publication in SSA. Although AJOL indexes 385 peer-reviewed journals from 29 different African countries, there are still some gaps in its database, as some journals are not yet indexed (Proud, 2010). For instance, only eleven journals were indexed in *African Journals Online* under the subject category of "Information, Communication and Library Sciences". That partly explains why the *UDIR* database was also used. Indeed, it uncovered other titles that were not included in *AJOL*. To be selected for the final analysis, the journals were supposed to be accessible online and should have been continuously published in the English language for more than four years during the period under review. The same criteria were partially used by (Ngulube, Mokwatlo and Ndwandwe, 2009).

Onyancha's (2009) study is also valuable in this regard. He assessed the performance of thirteen LIS journals published between 1991 and 2007 in SSA using Google Scholar and concluded that the five core LIS journals in the region were *AJLAIS, Indilinga: African Journal of Indigenous Knowledge Systems, Mousaion: South African Journal for Information Studies, South African Journal of Information Management (SAJIM)* and *South African Journal of Libraries and Information Science (SAJLIS)*. Although Onyancha's (2009) study is useful in showing publication trends in the LIS field in SSA, it may be argued that *Indilinga: African Journal of Indigenous Knowledge Systems* cannot be really considered as a core LIS journal of the region because the bulk of its articles primarily reflect a developmental discourse rather than a LIS discourse. However, it has inter-disciplinary linkages via indigenous knowledge systems with LIS. It was in that light and its categorisation as a LIS journal in *African Journals Online (AJOL)* that it was included in this study. Consequently, the results pertaining to the journal should be understood in this context.

Table 2: Sample frame for journals selected for the study

Name of Journal	*Availability online*	*Country publication*
African Journal of Library, Archives and Information Science (AJLAIS)	2000-2010	Nigeria
ESARBICA Journal: Journal of the Eastern and Southern Africa Regional Branch of the International Council on Archives (ESARBICA)	2001-2008	South Africa
Ghana Library Journal (GLJ) (2004-2005 not available online)	2002-2008	Ghana
Indilinga African Journal of Indigenous Knowledge Systems (INDILINGA)	2001-2008	South Africa
Information Manager (IM)	*2006-2007*	Nigeria
Information Technologist (IT)	*2004-2009*	*Nigeria*
Innovation: Journal of Appropriate Librarianship and Information Work in Southern Africa (INNOVATION)	2000-2008	South Africa
Journal of Librarianship and Information Science in Africa (JLISA)	2001	Nigeria
Lagos Journal of Library and Information Science (LJLIS)	2003-2005	Nigeria
Mousaion: South African Journal for Information Studies	2000-2008	South Africa
Nigerian Libraries (NL)	2000-2002	Nigeria
SA Archives Journal	2001-2003	South Africa
Samaru Journal of Information Studies	2006-2008	Nigeria
South African Journal of Information Management	2000-2009	South Africa
South African Journal of Libraries and Information Science	2002-2009	South Africa
University of Dar es Salaam Library Journal (UDSLJ)	2001-2008	Tanzania

The initial aim of the study was to analyse journals published between 2000 and 2010 in order to establish trends over a decade. But this decision was rescinded as the sample of the journals to be studied was going to be significantly small and biased towards journals published in South Africa. The journals that were available online for the period 2000-2010 are listed in table 2. There are evident gaps in the data and that was going to create difficulties in effectively comparing the results across different journals. A deliberate decision was made to cover the period 2004 to 2008 as more journals were published continuously then, and this was going to include more journals from Nigeria and Tanzania, thus making the sample relatively representative of SSA.

The choice of the cut-off date for analysis was determined by the fact that some journals published in 2009 had not yet been fully indexed at the time of the study. The scope of the journals published articles pertaining to the practice and research in librarianship written by librarians, archivists, documentalists, information scientists and other information related professionals mostly from SSA. This information was mainly gleaned from the affiliations of the authors. The authors mainly came from countries such as Botswana, Ethiopia, Ghana, Kenya, Malawi, Namibia, Nigeria, Lesotho, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe. The study by Ocholla and Ocholla (2007) confirmed that LIS research output in Africa was published by researchers from some of these countries.

These countries also have institutions of higher learning offering some kind of LIS education in one

form or another. There seems to be a positive relationship between affiliation of the authors of the articles and countries with LIS programmes. It seems the probability of an academic working in an LIS environment publishing their research in an academic journal is higher than other practising information professionals whose core business is not contributing to the development of knowledge through scholarly communication and research. That is partly confirmed by Sitienei and Ocholla (2010) who established that many academic librarians did not publish.

The analysis of the articles was at three levels. First, the research strategies employed in the journal articles were identified manually. Secondly, articles that utilised MMR were selected for further analysis. Lastly, based on the typology of evaluating MMR studies proposed by Creswell and Plano Clark (2007), the articles were scrutinised to:

- decide whether rigorous mixed methods were used;
- identify the mixed research purpose statement, research question, type of mixed method design and data analysis; and
- establish whether the authors of studies 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).

The research articles were first 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). Categorising articles using this taxonomy proved to be an arduous assignment because most authors using qualitative approaches neither clearly stipulated a theoretical paradigm that influenced the research nor fully described their research design. That detail becomes important when one considers that the qualitative methods may be closely related to positivist epistemology and realist ontology. For instance, as quantitative methods they may employ questionnaires, interviews and observation for data collection. We will develop this point later during the presentation of the discussion.

A total of 685 published articles, excluding editorials, reactions, tributes and non-research contributions categorised as general and short communications were analysed (see table 3). They were excluded in order to provide a sample that was representative of the research commonly presented in the journals.

Table 3: Summary of selected the articles and approaches employed

Approach	*AJLAIS*	*ESARBICA*	*Indilinga*	*Innovation*	*IT*	*Mousaion*	*SAJIM*	*SAJLIS*	*UDSLJ*	*Total*
Mixed	6	-	4	2	5	1	10	4	16	48
Qualitative	35	38	80	68	42	47	3	19	33	365
Quantitative	26	9	24	7	54	20	72	48	12	272
All Paradigms	**67**	**47**	**108**	**77**	**101**	**68**	**85**	**71**	**61**	**685**

The number of articles used in the study was considered to be adequate when compared to studies by Järvelin and Vakkari (1990) that analysed 449 articles, Hider and Pymm (2008) that examined 567 articles, Ngulube, Mokwatlo and Ndwandwe (2009) that evaluated 613 articles published between 2002 and 2008, and Rocco *et al.* (2003) that assessed 16 articles published in 1999 through 2001.

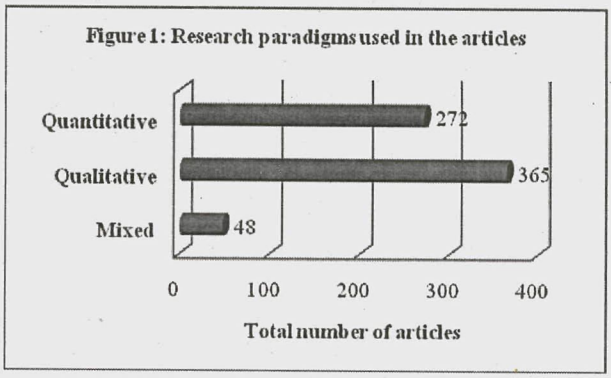
These examples are a pointer to the fact that the time span selected for analysis and the number of articles that are evaluated largely depend on the purpose of the analysis, circumstances of the author (for instance, the availability of a reliable database), and the sample that is likely to establish the trends that are of interest to the researcher. In most cases the periods that are studied are chosen arbitrarily as confirmed by Nwagwu (2007).

Results and Discussion

The results and discussions are presented below. They are hooked on the research questions that guided the study.

Use of Different Research Methods

The studies that were investigated fall on a continuum from mono-method to mixed methods. Figure 1 depicts the results. There was a considerable amount of difficult, when it came to articles that employed qualitative methods as it was difficult to fit the studies in the framework that was used to categorise the studies because the authors did not describe their research methodology. In fact, many methods sections and abstracts did not explicitly describe the research methodology. Understanding and categorising the various research methods can be a daunting task if they are no explicit explanations of the research methodology. A lack of detail on how studies are conducted by the researchers is not confined to SSA. Hernon and Schwartz (1994) observed that many LIS researchers have tended to focus on the findings and implications of their studies without giving details of the methods used in their studies. As Alise and Teddlie (2010) pointed out, researchers should consider making their paradigm preferences more explicit to facilitate proper classification of their work.



Overall, the qualitative approach dominated the research outputs during the period under review. The same cannot be said of articles published in *SAJIM* and *SAJLIS* where quantitative methods were more dominant than the qualitative ones. MMR research was not prevalent when compared to other research methods. The *ESARBICA* journal did not publish any MMR article. As in a study by Ngulube, Mokwatlo and Ndwandwe (2009), historical research seemed to be prevalent followed by the survey research design. The data collection tools included questionnaires, interviews (i.e. face-to-face and focus groups), observations and secondary data. Steps that were taken in order to increase instrument fidelity were only discussed by 12 (0.02%) researchers. It is essential for researchers to discuss the validity of their instrumentation as that enhances the confidence assigned to the findings.

Use of MMR

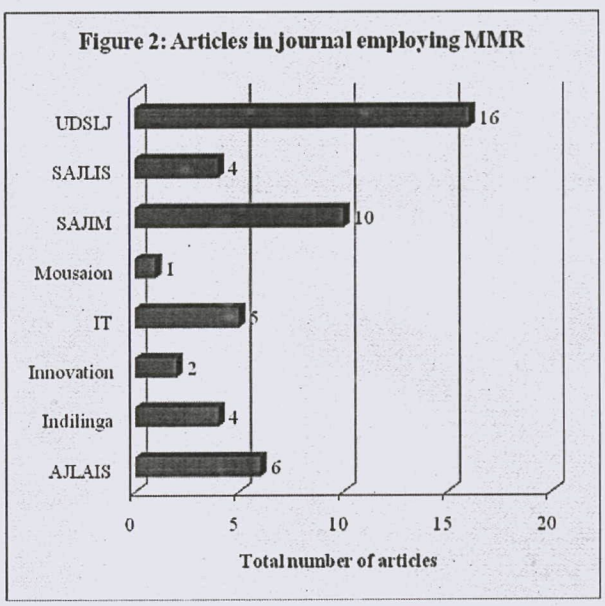
The current study determined that 7% of the research outputs evidenced the use of MMR. Previous studies conducted elsewhere in education, library sciences and business indicated prevalence rates for MMR to be between 5% and 29% "with an approximate average of around 14% to 15%" (Alise and Teddlie, 2010: 120). SSA is evidently below that international average. The prevalence of MMR research in journals published in SSA is depicted in Figure 2. *UDSLJ* accounted for 33.3% of the articles that used MMR, followed by *SAJIM* with 21%.

The researchers did not discuss any challenges they might have encountered using mixed methods research. Some of the challenges that are likely to be encountered by MMR researchers are unequal

sample sizes, selection of participants and steps for conducting the whole research (Creswell and Plano Clark, 2007). There is need for scholars who use MMR to describe their methodological challenges and techniques so that other researchers may replicate their studies. This issue is of particular importance since MMR is still evolving. Such explanations will provide examplars of MMR to the novice researcher and reader.

The qualitative and quantitative elements were not weighted equally. The quantitative element was always dominant. Studies that balanced the two elements, or had their dominance in the reverse order, were not evident. Mixing was sequential during data collection or analysis. It was always done from a quantitative angle to the qualitative one. No study reported the use of qualitative tools such as focus group discussions to construct the research instruments for their study, although that evidently happened in some of the studies at their preliminary stages when identifying constructs to measure.

Although, the frequently cited way of mixing in MMR is that it may occur at any point within a research project, from the purpose statement and statement of the research problem, to the data collection and analysis, to drawing inferences from the interpretation of the findings, most of the mixing in the articles that were evaluated happened during data collection or analysis.



Rationale for Using MMR

Authors who used multiple methods or blended research did not refer to it as MMR. Generally, reference was made to the use of combined qualitative and quantitative approaches. The main reason for using multiple methods was for the purpose of triangulation. Unlike, authors of articles in *UDSLJ* who explained why they used multiple research methods, other authors seem to have chosen mixed methods research because it was fashionable rather than for its capability to answer certain kinds of research questions as suggested by Bryman (2005).

Based on the five purposes identified by Greene, Caracelli and Graham (1989), the authors used mixed methods according to the triangulation purpose. The use of both qualitative and quantitative methods to gather and analyse data about the same phenomenon assisted in eliminating the inherent biases associated with using only one method. The major purpose of using MMR seems to have been aimed at the enrichment of the researcher's interpretation of data. The other three reasons for mixing approaches suggested by Collins, Onwuegbuzie and Sutton (2006), which include participant enrichment (for example, increasing the number of participants), instrument validity and reliability (for instance, pretesting and piloting the study), and treatment integrity (that is, assessing the reliability of interventions and programmes) were not evident in the articles that were analysed.

Variety of Mixed Methods Designs

While mixed methods designs may be parallel, sequential, conversion, multilevel and fully integrated as suggested by Teddlie and Tashakkori (2009), all used a sequential mixed methods design in the context of triangulation. The sequential or two-phase design provides the flexibility to adapt the second stage to the findings from the first research stage (Feilzer, 2010), but the studies did not highlight this fact. The studies seemed to be content to use multiple methods in the traditional way of triangulation where the concern was not to get a deeper understanding of the social phenomenon, but rather to detect inconsistencies in the findings. The bias was towards triangulating methods rather than mixing them. The other mixed methods designs such as expansion,

initiation, development and complementarity (see Greene, Caracelli and Graham, 1989) were conspicuous.

Degree of Integration of Methods

According to Teddlie and Tashakkori (2009), there is a need to investigate the degree of integration of qualitative and quantitative components in MMR studies. While proponents of MMR agree that an MMR project includes a mixture of both quantitative and qualitative components, they disagree on how these components should be linked and integrated during the research process. Little is known about how exactly one may combine qualitative and quantitative methods in one project.

Studies elsewhere have shown that quantitative and qualitative data and findings are not considerably integrated in most research studies (Greene, Caracelli and Graham, 1989; Woolley, 2009). In fact, many MMR researchers are struggling with true integration of the methods (Feilzer, 2010). Many reasons why the integration is not achieved have been given. They range from a lack of good examples that "genuinely integrate" qualitative and quantitative components in one research (Bryman, 2007; Yin, 2006) to limited information written about the research processes and techniques by which integration can be achieved (Woolley, 2009). In proposing a framework that may be employed in the process of integration in mixed methods studies, Yin (2006:42) emphasised that "the more that a single study integrates mixed methods across five procedures, the more that mixed methods research, as opposed to multiple studies, is taking place". The research procedures in question in this case include: research questions, units of analysis, sample for the study, instrumentation and data collection methods and analytic strategies.

It was difficult to gauge whether or not the instruments had both qualitative and quantitative elements because the majority of the articles did not append a data collection instrument or explain the characteristics of the instrumentation employed. Using the framework provided by Yin (2006), it is evident that MMR was used during data collection and analysis as illustrated in table 4. Only 8 (0.17%) of the 48 MMR articles that were analysed used mixed methods during data collection and analysis stages.

Table 4: Data collection and analysis procedures at which MMR was utilised

Procedure	*AJLAIS*	*Indiling a*	*Innovation*	*IT*	*Mousaion*	*SAJIM*	*SAJLIS*	*UDSLJ*	*Total*
Collection	5	3	2	4	1	8	2	15	40
Collection and analysis	1	1	-	1	-	2	2	1	8
All procedures	**6**	**4**	**2**	**5**	**1**	**10**	**4**	**16**	**48**

A large proportion of the articles that were analysed mixed the methods in a limited way. Thus, most of them were quasi-mixed as characterised by Alise and Teddlie (2010). Most authors (40 out of 48) presented parallel results rather than attempting to integrate them. In other words, findings from different data collection methods were reported alongside each other and the findings discussed separately. Although, the researchers used both qualitative and quantitative methods, the presentation of results reflected the quantitative/qualitative divide as they were "totally or largely independent of each other" (Bryman, 2007:8).

Recommendations and Conclusion

The findings show that the use of mixed methods research by LIS scholars in SAA was not fashionable. The question is: What needs to be done to enhance the use of MMR in SSA? There should be a change of focus on the research methods used by researchers in SSA. That will need skill and the change of the mindset. Scholars in SSA should be aware that MMR is uniquely suited to investigate complex information science issues.

The results show that the incidence of the qualitative approaches is not so much at variance with the use of quantitative ones (see Figure 1). It is very rare to get researchers who are really good in both qualitative and quantitative approaches. In that regard, there is a strong case for researchers with a qualitative orientation to team up with quantitative specialists to research the same phenomenon in order to enhance the richness of data obtained. Forming research teams from both schools of thought may add breadth and depth of understanding the research process. Forming collaborative research teams is one of the possible ways of promoting MRR research in SSA. However, teams have to carefully negotiate and navigate disciplinary or theoretical differences and individuals' status, power, money and interests.

This study has several limitations that merit discussion. A lack of agreed "operational definitions for the codes associated with methodological indicators" was an obvious handicap (Alise and Teddlie, 2010). Secondly, content analysis is a partial and crude indicator of the prevalence of MMR in LIS research in SAA. The current research could have benefited from a mixed methods research approach. Interviews of purposively selected participants might have provided insights that might have been obscured by our research design. Furthermore, the author could have surveyed the members of the editorial boards of the various journals on method of data collection as employed by Short *et al.* (2010). That might have revealed a deeper understanding of why MMR was not popular.

For instance, some researchers may not include a detailed explanation of the use of MMR designs in their research for the reasons outlined by Bryman (2005; 2007). They include:

- Limitations imposed by journals: length requirements may force authors to limit what they can include when reporting their findings and lose information in the process.
- Orientation of journal: some journals are biased towards reporting either qualitative or quantitative findings at the exclusion of mixed methods.
- Tendency to tailor research reporting to the needs of the editors.
- Emphasis on one set of findings "because they have greater faith in one rather than the other, usually because of their methodological predilections".

Such reasons do not become apparent when using the research design in this study. In other words, another approach might have helped to unravel why researchers seem to neglect using MMR designs in their research articles other than the insights gleaned from using content analysis. That fact should be considered when looking at the findings presented here.

Finally, mixed methods research is a new research paradigms although anthropologists and sociologists used multiple research methods since the 1950s. The emphasis then was on measuring social phenomenon using measures that would either end up producing numbers only or anything else except numbers. There was a limited attempt to integrate the quantitative and qualitative measures throughout the whole process. With the rise of MMR as a third research paradigm, the focus is on conducting research that blends the philosophical, epistemological, ontological, axiological and

methodological underpinnings of the two paradigms to ensure the integration of qualitative and quantitative procedures throughout the whole research cycle.

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