Chapter 8
Mixed Methods and Quality of Postgraduate Research: A Kenyan Perspective

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ABSTRACT

This chapter analysed the extent, nature, and suitability of use of mixed methods research by postgraduate students in Kenya as well as its influence on the quality of their research output. Data anchoring the chapter was collected through qualitative content analysis of 229 theses and dissertations of library and information science postgraduate students in Kenya retrieved from the respective institutional repositories. Of these, 193 were Master's dissertations while 36 were doctoral theses. One hundred twenty-two (53.3%) of the theses and dissertations were developed using mixed methods research while 74 (32.3%) were based on qualitative studies. Most of the students collected both qualitative and quantitative data concurrently and merged the same during analysis and interpretation. It also emerged that the bulk of data collected by the students was qualitative; quantitative data was largely used to supplement or validate qualitative data. Using citations, it emerged that theses and dissertations developed through mixed methods research attracted more citations thereby indicating a superior quality.

INTRODUCTION

Mixed methods research is perceived as a new research approach which is still evolving compared with the more established quantitative and qualitative methods (Tashakkori & Creswell, 2007). Consequently, what it is and its application are still the subject of myriad studies and conversations. Indeed, a critical subject of debate in this regard is the uncertainty of the paradigm in which it fits (Migiro & Magangi, 2011). Some researchers have argued that it is challenging to mix quantitative and qualitative approaches because they are perceived as being incompatible (Doyle, Brady & Byrne, 2016). Despite a lack of consensus about the aforementioned aspects of mixed methods research, Hashemi and Babaii (2013) asserted that it has been accepted as the third research approach which is distinct from the quali-

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tative and quantitative methods. Johnson, Onwuegbuzie and Turner (2007) argued that mixed methods of research is the third research approach anchored on the pragmatic paradigm. Thus, mixed methods research considers "multiple viewpoints, perspectives, positions, and standpoints" (Johnson, Onwuegbuzie & Turner, 2007, p. 113).

In the attempt to develop an acceptable characterisation of the concept, Johnson, Onwuegbuzie and Turner (2007) examined nineteen definitions of mixed methods research. They concluded that there is a consensus that mixed methods research mixes both qualitative and quantitative approaches to scientific research. They also averred that the mixing of the approaches can occur at any stage of the research process depending on the context and purpose of the study. On the orientation of mixed methods research, two viewpoints are evident in literature; the first is the bottom-up approach which argues that mixed methods research should be driven by the research questions under investigation (Newman et al., 2003). By contrast, the second viewpoint argues that a top-down orientation in mixed methods research is not driven by research questions but by the determination of the researcher to conduct a study which is participatory and less marginalising (Mertens, 2003; Tashakkori, 2006). Although views on the orientation of mixed methods research are divided, Johnson, Onwuegbuzie and Turner (2007) propose a middle ground by explaining that the orientation can either be bottom-up or top-down depending on the purpose and context of the specific research project. While some scholars (Morse, 2003) posit that mixed methods research should demonstrate either a qualitative or quantitative dominance, others (Johnson et al., 2004; Onwuegbuzie & Johnson, 2006) hold the view that it involves a blending of the approaches leading to mixed ideas, assumptions, and worldviews.

It is also evident from literature that different scholars use diverse terms to describe mixed methods research. Some of these include blended research (Thomas, 2003), integrative research (Johnson & Onwuegbuzie, 2004), negotiated study (Bryman, 2007), triangulated research (Campbell & Fiske, 1959), multimethod research (Morse, 2003; Bazeley, 2006; Hunter & Brewer, 2003), multiple methods (Smith, 2006), triangulated studies (Sandelowski, 2003), ethnographic residual analysis (Fry, Chantavanich, & Chantavanich, 1981), and mixed research (Johnson, 2006; Johnson & Christensen, 2019).

Opinion about the origin of mixed methods research is divided. In fact, Small (2011) opined that it is not easy to identify the origins of mixed methods research and argued that the approach is evident throughout the history of research, particularly in the social sciences. Nonetheless, Hesse-Biber (2010) identified an 1800s study by Le Play (1855) which utilised both qualitative and quantitative approaches to investigate poverty levels in families in Europe. Similarly, a study by DuBois (1899) argued for the combination of statistical (quantitative) and observational (qualitative) data to unravel complex issues in society. Many scholars (Creswell & Clark, 2011; Maxwell et al., 2015; Maxwell, 2016; Mertens, 2017; Timans et al., 2019), however, pointed to the work of Campbell and Fiske (1959) which advocated triangulation of research methods as the origins of mixed methods research. Creswell and Clark (2011) explained that despite evidence of earlier use of mixed methods research, it gained a wider acceptance and application in the 1980s and 1990s. Potokri (2016) also asserted that despite the differences of views about its origins, the popularity of mixed methods research has increased in recent years.

In the context of this chapter, and recognising the fact that postgraduate students may not delve into complex issues about the method, the author assumes that mixed methods research is a blended approach to scientific inquiry which does not demonstrate a mutually-exclusive dichotomy between quantitative and qualitative methods. Conversely, it facilitates the mixing of assumptions, techniques and tools in proportions and sequences suitable for the purpose and context of specific research projects. Using information sciences postgraduate students in Kenya as a case study, the aim of this chapter is to analyse

the extent, nature and suitability of use of mixed methods research by postgraduate students in Kenya. It also assesses the influence of mixed methods research approach on the quality of research output.

CONTEXTUAL INFORMATION

Kenya requires highly skilled personnel to deliver its vision of becoming a middle-income economy by the year 2030. Therefore, the government has taken a keen interest in the production of knowledge workers with advanced degrees. Although credible statistics are not readily available, the number of people enrolled in postgraduate programmes in the country has grown in the recent past. According to Mukhwana et al. (2016), 63,999 postgraduate students enrolled in diverse academic programmes in universities in Kenya in 2015. They explained that this number constitutes only 11.9% of all the students enrolled in degree programmes in public and private universities in Kenya. Further, they (Mukhwana et al. 2016) observed that the progress of postgraduate students from registration to graduation was slow due to a weak support and supervision system in the country since only 34% (5,604) of the academic staff in Kenyan universities hold a PhD and are able to supervise postgraduate studies. Assuming all the PhD holders are supervising an equal number of students, this converts to each person supervising about 12 students. This is significantly higher than the recommended number of five (5) students per supervisor. Thus, the quality and number of postgraduate students produced in the country is below expectation. Although the numbers may have changed since this study was conducted, the situation remains the same.

The Kenyan situation reflects the scenario in other developing countries. Indeed, Ssenyonga and Nakiganda (2020) reported a similar situation in Uganda where they reported a low enrolment and completion of postgraduate studies. They concluded that only students who pursued postgraduate diplomas completed their studies on time. Most of the Master's and doctoral students only completed their first years of study and took much longer to complete their research projects and graduate. Kyaligonza at al. (2015) explained that the low completion rate was partially attributed to the fact that most universities lack adequate supervisors. By contrast, Mok and Neubauer (2016) reported that countries in Europe and North America registered a relatively higher number of postgraduate students who equally completed their studies within the stipulated time.

In Kenya, many factors such as a university's research policy, culture and environment play an important role in influencing postgraduate research productivity. However, the quality of research mentorship and supervision are the critical success factors (Kipchirchir, 2015). Indeed, Mukhwana et al. (2016) argued that one of the important factors delaying the progress of postgraduate students in Kenya is inadequate research mentorship support. They further averred that the research design and approval stage required more support and took more than half the duration of the study. Kipchirchir (2014) also argued that poor research skills by students were a significant contributor to delayed completion of postgraduate studies in Kenya. This is in spite of the fact that postgraduate studies curricula, especially at Master's level, include courses on research methods. Doctoral students pursuing coursework programmes also take classes on research methods. Mukhwana et al. (2016) argue that most of these courses are theoretical in nature and do not adequately equip the students with the requisite skills for their research.

Supervisors are also expected to mentor their students to publish scholarly materials from their theses and dissertations (Wangenge-Ouma et al., 2015). However, despite postgraduate students producing an enormous volume of research every year, this is not reflected in the volume of research publications generated by them (Kipchirchir, 2014). Even though in Kenya, Master's students are generally expected

to publish at least one (1) journal article from their dissertations before they can be allowed to graduate. Similarly, doctoral candidates are expected to publish at least two (2) papers before they can be processed for graduation (Mukhwana et al., 2016). It has been observed that many of these students struggle to publish leading to graduation delays (Onguka & Wechuli, 2019). One of the factors contributing to this publishing challenge is the perceived low quality of the manuscripts developed by the students from the theses and dissertations. This implies that the dissertations and theses may also be of low quality given that the manuscripts are excerpts from them.

Mukhwana and Too (2017) explained that the debate about the quality of postgraduate training in Kenya persists and is pertinent. They further asserted that these quality challenges largely emanated from inadequate mentorship of postgraduate students on research and scholarly communication, among other areas. They suggested that postgraduate training should be anchored on research and supervised by mentors who are active researchers. Talib et al. (2019) concur and suggest that there is a need for experienced supervisors to mentor postgraduate students on conducting, analysing and publishing their research.

According to Wambugu and Njoroge (2021), most postgraduate students who pursue multidisciplinary research projects opt for mixed methods research as a means of benefitting from the diverse qualitative and quantitative perspectives facilitated through mixed methods research. The use of mixed methods research also enables researchers to address weaknesses of adopting either a quantitative or qualitative approach. The choice of mixed methods research is also influenced by the philosophical assumptions espoused by the individual researchers. The influence of methodology on the quality of research output cannot be overemphasised. Available data indicates that most postgraduate students in Kenya apply mixed methods research approach. Therefore, the big question is: Can the perceived low quality of dissertations and theses be attributed to the use of mixed methods research? The rationale for using mixed methods is to draw multiple perspectives to research issues by applying multiple techniques and tools. Therefore, this research approach should, ideally, lead to high-quality research output. How can the perceived low quality be explained? Is it possible that the postgraduate students are not applying the mixed methods research approach appropriately? If so, how can this challenge be addressed to improve the quality of research output by postgraduate students in Kenya? This chapter addresses these questions as a means of contributing to efforts to enhance the quality of research output from postgraduate students in Kenya.

LITERATURE REVIEW

The prevalence of mixed methods research is one theme which is evident in the literature on the subject. Mixed methods research is increasingly becoming a preferred methodological research approach for researchers and academics in diverse disciplines (Bangi, 2018; Cameron, 2011; Pridmore, 2019). Azorín and Cameron (2010) reported that mixed methods research has steadily gained popularity in disciplines such as sociology, psychology and education. More disciplines have increasingly accepted mixed methods research. Some of these include political science (Harrits, 2011), mathematics (Ross & Onwuegbuzie, 2012), library and information science (Ngulube, Mokwatlo, & Ndwandwe, 2009; Ngulube, 2020), education (Truscott et al., 2010), environmental science and management (Molina-Azorín & López-Gamero, 2016), business management (Cameron & Molina-Azorín, 2011), economics (Ngulube & Ngulube, 2015), tourism (Molina-Azorín & Font, 2016), and human resource management (Chambers et al., 2016). A growing prevalence of mixed methods research amongst postgraduate students has also been observed and documented (Bangi, 2018; Stockman, 2015; Ukwuoma, 2015; Weber, Lynch

and Oluku, 2013). Mixed methods research is also popular with research funding agencies which have increasingly become comfortable supporting studies applying the approach (Creswell, 2011). Recognising the fact that mixed methods research emerged in social and behavioural sciences, it is worth noting that its popularity has spread to natural sciences as well. Andrew and Halcomb (2009) explained that the use of mixed methods research approach has increased in health sciences, particularly nursing. They explained that this popularity is reflected in the growing number of higher degree theses which employed the approach. Many scholars hold the same view that mixed methods research approach has gained popularity in health sciences in the recent past because it offers researchers greater opportunity to deeply understand complex health issues that would not be possible with either quantitative or qualitative approaches alone (Kroll & Neri, 2009; Cameron, 2011; Feilzer, 2010; Harrits, 2011; Halcomb & Hickman, 2015; Ivankova, 2014; Padgett, 2011; Symonds & Gorard, 2010). Creswell (2011) argued that in spite of its growing popularity, mixed methods research is not the panacea of all the challenges affecting research methodologies; it has limitations which should be identified and addressed.

Another pertinent theme which is discernible from literature is the rationale for selecting mixed methods research approach. Feilzer (2010, p.6) argued that mixed methods research is "a response to the long-lasting, circular, and remarkably unproductive debates discussing the advantages and disadvantages of quantitative versus qualitative research as a result of the paradigm wars". According to Azorín and Cameron (2010), the rationale for selecting mixed methods research is anchored on its methodological pluralism and broad perspectives to research issues which mono-methods do not adequately provide. Greenberg (2007) explained that it is a response to calls for methodological diversity in conducting integrated research as a means of generating wholesome output. On the rationale for applying mixed methods research, Johnson et al. (2007) explained that the mixing of methods enables researchers to validate and explicate findings; provide a greater understanding of the issues under study and stronger confidence in the conclusions; and elicit more meaningful answers to research questions. According to Tashakkori and Creswell (2007), the main reasons for selecting mixed methods research include the fact that it enables triangulation by facilitating corroboration of quantitative and qualitative data; provides a complete picture of the issues under study; enables the neutralisation of the weakness of either method; provides answers to research questions which cannot be answered by either qualitative or quantitative approaches alone; and it enables researchers to explain unanticipated findings. According to Dawadi et al. (2021), mixed methods research enables researchers to widen the breadth and depth of their projects, complementing qualitative with quantitative approaches and vice versa, unravel the real picture of the issues under study, and to develop refined and comprehensive research conclusions. Similar arguments for the use of mixed methods research have been provided by other scholars (Foroudi et al., 2021; Norton et al., 2021; Schumacher et al., 2021; Woodcock et al., 2021).

Discussions on the quality of research output from mixed methods is also evident in the literature. Some scholars (Halcomb & Hickman, 2015) have argued that a demonstration of the rigour in the application of mixed methods research is lacking. Indeed, Lavelle et al. (2013) claimed that the rigour of most studies applying mixed methods research is poorly defined, leading to poor validity of output. Creswell and Clark (2011) suggested that the same level of rigour demonstrated with the application of either quantitative or qualitative studies should be embraced by researchers using the mixed methods approach as well. Lavelle et al. (2013) recommended that rigour in mixed methods approach can be demonstrated by providing readers with comprehensive audit trails of the criteria and justifications for the decisions made in the conduct of research. Indeed, Wisdom et al. (2012) argued that most papers produced through mixed methods research lacked essential details of the approach and its application. Therefore,

they further opined that the perceived low quality of research produced through mixed methods stems from the non-familiarity of the approach by both reviewers and readers. Cameron (2011) suggested that researchers reporting output from projects undertaken using mixed methods should creatively present their findings in non-conventional formats but in ways which are comprehensive and complete. According to Dellinger and Leech (2007), validity is a major concern for users and readers of mixed methods research outputs. They explained that many mixed methods researchers consider validity separately for the quantitative and qualitative aspects of their studies. Onwuegbuzie and Johnson (2006) proposed the concept of legitimization to replace validity in mixed methods research. They averred that the concept of validity has historically been associated with quantitative studies. They argued that legitimation advocates the consideration of multiple validities spanning the design, execution and interpretation of research.

There are also criticisms of mixed methods research in literature. For instance, Sandelowski (2014) argued that mixed research methods approach brings nothing new to research methodology. Conversely, she opined that it is a mere repackaging of existing research approaches. Greene (2008) also argued that mixed methods research lacked a backbone around which the mixing can be fixed. She suggested the need for further development of the approach to make it more anchored philosophically. Questions have also emerged about synergy, which is one of the perceived strongest attributes of the mixed methods research approach. Hesse-Biber (2015) and Guest (2013) argued that many researchers have glossed over this issue and have not critically examined its nature as well as the extent to which it is beneficial to scientific research. Flick (2017) raised questions about what is mixed in this approach and wondered whether it is just the quantitative and qualitative methods only. The view that only quantitative and qualitative methods are mixed is limiting since some researchers may choose to mix different forms of quantitative or qualitative approaches. Polit and Beck (2010) also raised concerns about the extent to which the results of mixed methods research can be generalised. They highlighted the need for comprehensive conversations on strategies to enhance the generalisability of mixed methods research outputs. These critiques serve to demonstrate the attention that mixed methods research approach has attracted amongst researchers. Although no concrete conclusions or universal consensus have been arrived at yet, mixed methods research approach is getting better with continuous refinement.

According to Heydari and Yazdimoghaddam (2015) as well as Kwanya et al. (2014), postgraduate theses and dissertations are important sources of knowledge and demonstrates the level of preparedness of the candidates to conduct scientific research. They emphasise that postgraduate students need to be mentored adequately to develop effective research skills and produce high quality theses and dissertations. They further assert that lack of adequate mentorship leads to lack of essential research skills which limits the students' capacity to conceptualise and conduct research projects. This is often manifested in poor application of research methodology which ultimately affects the quality of theses and dissertations negatively. Adenagbe et al. (2021) conducted a correlational study on the link between supervision and the quality of postgraduate theses in Nigeria. They concluded that the effectiveness of supervision influenced the quality of the theses produced by postgraduate students. They explained that poor quality theses were indications of poor application of research methodology and blamed the situation to inadequate supervision. Similar views were upheld by other scholars in diverse contexts (Lovitts, 2005; Mackinnon, 2014; McAlpine & Norton, 2016). Associated with the general weakness in research methodology, Shahsavar and Kourepaz (2020) also identified inadequate capacity to synthesise, critique, or explain literature as another weakness with postgraduate theses and dissertations. They explained that most students "mainly focused on summarising other researchers' findings and interpretations" (p. 1). Other scholars have also identified weaknesses with ensuring reliability and validity of findings (Omillo-

Okumu, 2020); theories and models (Sahin et al., 2020); determination of sample sizes (Ikehi et al., 2019); presentation, analysis and interpretation of findings (Zoabi & Kan'an, 2018), as well as citations and reference management (Nnadozie & Okechukwu, 2017), among other issues. It can be concluded from the foregoing that the appropriate application of research methodology influences the quality of postgraduate theses and dissertations. Granikov et al. (2020) explained that the use of mixed methods research is expected to result in high quality publications. Nonetheless, Bangi (2018) averred that there is no research method which does not have weaknesses. Furthermore, the way a method is applied in a specific research context can also influence the quality of the results. For mixed research methods, Coates (2021) argued that inadequate anchoring of the approach on philosophical worldviews affected the quality of research output from the method. Indeed, Fàbregues et al. (2021) asserted that quality of mixed methods research is context-dependent.

The purpose of this chapter is to unravel the nexus between the use of mixed methods research and the quality of research output. This issue has not been studied comprehensively in the context of LIS postgraduate research in Kenya. Some of the unanswered questions are: Can the perceived low quality of dissertations and theses be attributed to the use of mixed methods research? Is it possible that the postgraduate students are not applying the mixed methods research approach appropriately? How can these challenges be addressed so as to improve the quality of research output? As the mixed methods research approach becomes widely accepted in diverse disciplines, there is need for local solutions to the challenges highlighted here. Therefore, this chapter uses library and information science postgraduate students' research to draw attention to conversations on the best use of mixed methods approaches in postgraduate research.

METHODOLOGY OF STUDY

The study on which this chapter is anchored was conducted using qualitative content analysis. Elo and Kyngäs (2008) explained that content analysis is a method of studying written, verbal or visual communication media, documents or messages. Harwood and Garry (2003) reported that content analysis was originally used to analyse hymns, newspaper articles, advertisements or speeches in the 19th Century. Neundorf and Kumar (2015) explained that the application of content analysis in wider areas of research has increased in the past few decades. According to Assarroudi et al. (2018), qualitative content analysis is a systematic means of analysing, interpreting and describing qualitative or textual data. In the context of this chapter, qualitative content analysis was perceived as the systematic and objective technique for analysing manifest text in theses and dissertations authored by library and information science postgraduate students in Kenya.

The theses and dissertations were retrieved from institutional repositories of universities in Kenya which offer postgraduate studies in library and information science. The repositories were organised by school and further by level of study. Thus, Master's and doctoral theses and dissertations were listed separately. All the theses or dissertations available in full text were downloaded. In some universities, the repositories had theses and dissertations of all staff, including those which were not obtained from the universities under analysis. These were excluded. The unit of analysis was the theses or dissertations of all information science postgraduate students in Kenya who graduated between 1995 and 2020. The first cohort of library and information science postgraduate students in Kenya graduated from Moi Uni-

versity in 1995 hence the baseline setting. Meta-synthesis approaches were used to review the retrieved documents.

A total of 229 theses were retrieved and analysed. Of these, 193 were Master's dissertations while 36 were doctoral theses. The theses were retrieved from the institutional repositories of four universities; Moi University, Kenyatta University, the University of Nairobi, and the Technical University of Kenya. The majority (135) of these were from Moi University. This is because Moi University was the first university to offer postgraduate library and information science programmes in Kenya. The university also has the largest number (13) of postgraduate programmes compared to Kenyatta University (2), University of Nairobi (1) and the Technical University of Kenya (1). In terms of the number of theses and dissertations, the other universities fared as follows: Kenyatta University (48), University of Nairobi (34), and the Technical University of Kenya (12). Although there are other universities in Kenya offering postgraduate training, the theses or dissertations of the students were not published on their institutional repositories at the time of collecting data for this chapter.

PREVALENCE OF MIXED METHODS RESEARCH AMONG LIS POSTGRADUATE STUDENTS IN KENYA

From the 229 theses and dissertations retrieved, mixed methods research emerged as the most popular approach with 122 (53.3%) of the candidates indicating that they used it. Mixed methods was followed by the qualitative approach with 74 (32.3%), quantitative approach with 5 (2.2%), and experimental with 3 (1.3%). Another 25 (10.9%) candidates did not clearly state the research approach they used. Figure 1 presents the findings. It was observed that the studies conducted before 2010 did not use the term "mixed methods" but instead used "qualitative/quantitative" or "multiple methods" approaches. This perhaps can be attributed to the fact that mixed methods research then was still developing and was not commonly used in Kenya. As indicated in Figure 2, most of the postgraduate studies which utilised mixed methods research were conducted after 2010.

Figure 1. Research approaches used by LIS postgraduate students in Kenya

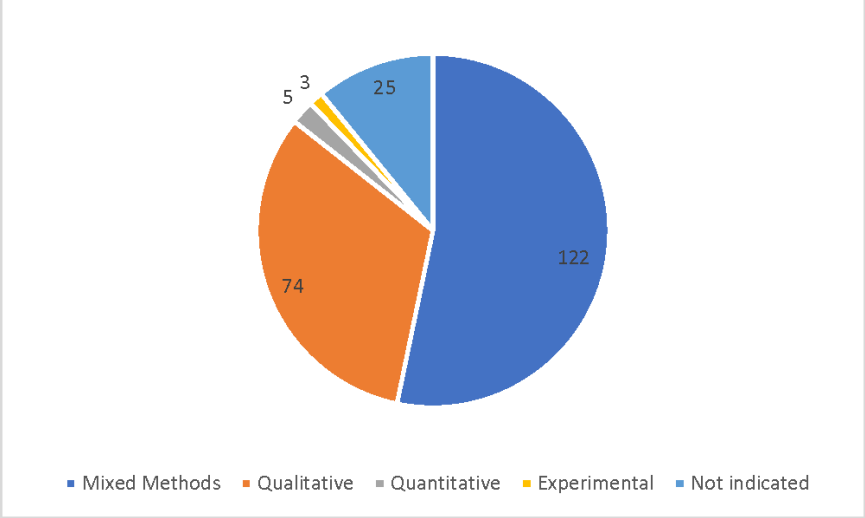
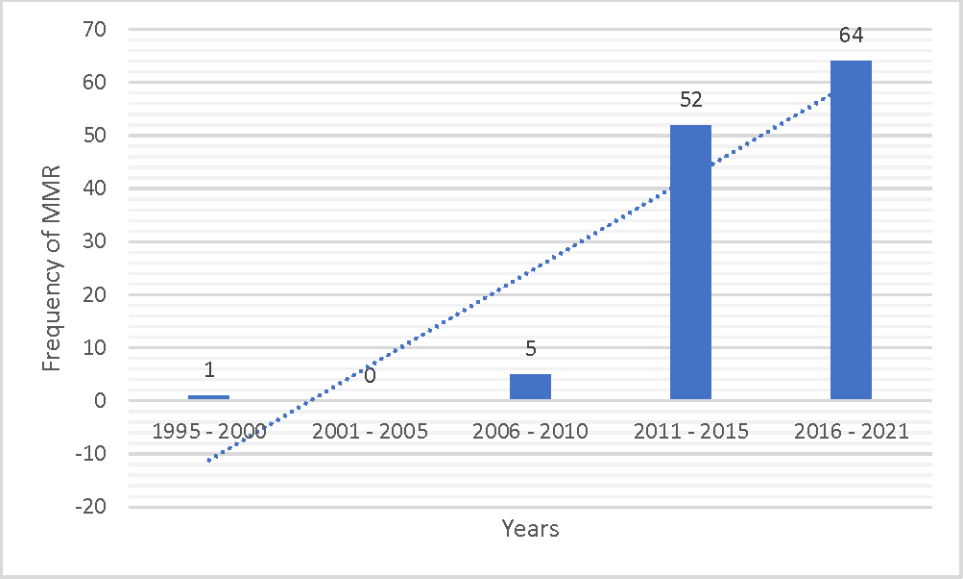


Figure 2. Distribution of the number of mixed methods research used over the years



The findings of this study concur with similar studies in other disciplines. For instance, Taş and Duman (2021) studied postgraduate theses on curriculum development in Turkey and found a prominent application of mixed methods research by postgraduate students. Warfa (2016) studied the use of mixed methods research amongst biology students and registered an increase. McKim (2017) also concluded that postgraduate students continue to find greater value in applying mixed methods research than other approaches. In fact, he argued that "graduate students view mixed methods passages as having rigorous methods, a newer history, and providing a deeper meaning of the phenomenon" (p. 202). Archibald et al. (2015) also argued that mixed methods research has not just become popular amongst graduate students but also amongst all cadres of scientific researchers. Clark (2010) and Ngulube (2010) also reported that the popularity of mixed methods research has been on a steady increase for the past 30 years. This implies that the approach is popular amongst all researchers, including LIS postgraduate students.

It is important to point out, however, that some studies have shown that mixed methods is not the most popular approach in some contexts. A study by Arcagok (2021) on social studies postgraduate theses in Turkey revealed that quantitative method was most popular. It was followed by mixed methods research and qualitative studies in that order. The findings of this study also contradict a study by Ngulube (2013) which concluded that mixed methods research was the least popular amongst LIS researchers in Sub-Saharan Africa. Actually, the 2013 study found that qualitative research approach was the most popular followed by the quantitative approach. However, there appears to have been a change of perception among LIS scholars about the suitability of mixed methods research in the discipline. This change may have resulted from sustained awareness created in the potential benefits of mixed methods to LIS research. Weis et al. (2019) also explained that many more postgraduate students are currently trained on mixed methods research in their research methodology classes. This makes them to be more familiar with the approach thereby making it much more popular. A similar view is put forth by Roberts and Allen (2019) as well as Rosenkranz, Wang and Hu (2015).

From the foregoing, this chapter concludes that mixed methods research is a popular approach which has also been embraced by library and information science postgraduate students in Kenya. Library and information science, by its own nature, is a multidisciplinary area of study. This makes it a natural home of multidisciplinary researchers who are inclined towards mixed methods research. It is important to note, however, that the growing popularity of mixed methods research is not unique to Kenya or LIS profession. It is a global trend which has enabled mixed methods to emerge as the third dominant research approach. Knowing that students often work in communities, it is also possible that many of them are influenced to use mixed methods by their own colleagues who are either using the same or have used it in the past. The more times mixed methods research is applied the better it becomes. Similarly, demand for advanced skills in conducting mixed methods research has grown with its popularity. This popularity is expected to be maintained into the foreseeable future as the approach gets more rooted and refined. Popularity of the approach is also likely to be driven by the current promotion of multidisciplinary research by funding institutions such as the National Research Fund (NRF) in Kenya among other agencies.

FACTORS INFLUENCING THE SELECTION OF MIXED METHODS RESEARCH BY LIS POSTGRADUATE STUDENTS IN KENYA

The students who used mixed methods research provided diverse reasons to justify their choice. These reasons revolved around the perceived flexibility of the approach in terms of data collection and analysis. The other prominent reason was the complementarity attribute which enables researchers to compensate the weaknesses of quantitative approaches with the strengths of qualitative approaches and vice versa. It is worth noting, however, that there were several students who did not give any justification for choosing mixed methods research approach. Most of them just stated that they collected both quantitative and qualitative data without explaining why they deemed it to be the most suitable approach for their studies. Some of the justifications given by the students are listed hereunder as they appear in the theses or dissertations:

- "Either qualitative or quantitative approaches alone were deemed as inadequate to develop multiple perspectives and complete understanding about the effect of knowledge sharing on performance amongst teaching staff in public universities in Kenya" (**PhD2**).
- "The triangulation of methods helped to best understand the research problem as well as provide a convergence of results. It captures the best of both qualitative and quantitative approaches and any bias inherent in any method is counteracted" (**PhD4**).
- "Overcomes the deficiencies presented by one data collection method. To bring together the differing strengths and non-overlapping weaknesses of quantitative methods (large sample size, trends and generalizations) with those of qualitative methods" (**PhD6**).
- "To avert the inherent weaknesses of either qualitative or quantitative method" (**PhD7**).
- "To capitalize on the strengths of both qualitative and quantitative methods and at the same time, compensate for the weakness of each method" (**PhD7**).
- "The mixed method approach facilitated triangulation of data sources sought by qualitative and quantitative data collection methods, and information obtained from multiple respondents" (**PhD15**).
- "To consider multiple viewpoints, perspectives, positions, and standpoints" (**PhD18**).

- "Enhance understanding through both qualitative and quantitative data; guard against biasness that each method could bring; gain broader perspective into the subject of inquiry as a result of using the different methods as opposed to using one predominant method alone; mixed method approach ensured that the results from one methodology would be enhanced by the results from the other methodology." (**MSc12**).
- "Mixed method research also allowed the researcher to study different groups or levels" (**MSc14**).
- "Provided a better understanding of the research problem than either type by itself, either qualitative or quantitative was not enough to address the research problem or answer the research questions, practicality; multiple view points; biased and unbiased; subjective and objective" (**MSc17**).
- "Compensate for the inherent weaknesses in each" (**MSc33**).
- "Improve the quality of research by ensuring that conclusions arrived at were more likely to be correct and accepted as such" (**MSc36**).
- "Discover varying facets of the problem under investigation by collecting diverse types of data in a single study" (**MSc62**).
- "Encourage greater interaction between the researcher and the respondents" (**MSc71**).
- "Allows the researcher to have a detailed understanding of the perspectives" (**MSc74**).
- "To provide a better understanding of research problems than either approach; the disadvantages of one method are closed by the advantages of the other and vice versa" (**MSc78**).
- "Assisted the researcher in describing the situation as it is currently, and why it is the way it is; enabled the researcher to obtain information from the target population which was critical in the analysis of their views and responses" (**MSc89**).
- "Captures the diverse views on user interaction with information resources and communication channels, as well as studies the relationships existing among subjects" (**MSc107**).
- "Gives strengths for both the qualitative and quantitative; thus, they complement each other" (**MSc110**).
- "They both supplement each other in that the qualitative methods provide the in-depth explanations while quantitative methods provide the hard data needed to address the objectives and to test hypotheses" (**MLIS2**).
- "Enables for a greater validity and also ensure completeness and sufficiency in description" (**MLIS8**).

An analysis of the reasons given by LIS postgraduate students in Kenya reveals the fact that they are essentially not different from what is given in literature. However, there are unique nuances which reflect local preferences. Table 1 presents a summary of the key reasons for selecting mixed methods research by LIS postgraduate student.

As shown in Table 1, quality (25.06%) was the most prominent reason for selecting mixed methods research by postgraduate LIS students in Kenya. This was followed by the quest for synergy (22.97%) attained by combining multiple methods. The other prominent reasons for selecting mixed methods were objectivity (15.08%), triangulation (12.99%) and broad coverage (10.21%).

Table 1. Summary of the rationales for selecting mixed methods research by postgraduate LIS students in Kenya

Theme	Rationale	Freq	%
Adequacy of focus	Overcomes deficiencies of using one approach	13	3.02
Triangulation	Multiple perspectives, opinions and viewpoints	56	12.99
Synergy	Capitalises on strengths while compensating for weaknesses	99	22.97
Coverage	Broad, deep and multi-layered coverage of research issues under study	44	10.21
Participation	Greater interaction with respondents and/or subjects	7	1.62
Flexibility	No prescribed "dos" or "don'ts"	11	2.55
Practical	Realistic view of research issues in their contexts	25	5.80
Legitimacy	Multiple validities spanning the entire research spectrum	3	0.70
Quality	Better quality attained through enhanced research rigour and participation	108	25.06
Objectivity	Methodological pluralism reduces biasness	65	15.08
Total		**431***	**100**

*Most students gave multiple reasons for selecting mixed methods research.

HOW MIXED METHODS RESEARCH APPROACH WAS USED IN THE STUDIES

Most students did not explain how exactly mixed methods research approach was used in their projects. Therefore, it was not possible to clearly understand how, or at what stage, the mixing was done. What was mixed was also not discernible from most of the theses and dissertations reviewed. Nonetheless, some of the students explained that quantitative and qualitative data was integrated during analysis; both quantitative and qualitative sources of data were combined to provide a complete picture of the issues being studied; multiple methods of data collection were used; concurrent quantitative and qualitative data collection was done; and that both qualitative and quantitative data was collected and mixed during analysis. Two of the explanations are provided verbatim hereunder:

- "Validate quantitative findings obtained from questionnaire by referring to information extracted from the qualitative findings obtained from interviews and observation" (**PhD18**).
- "Both quantitative and qualitative methods were used sequentially to complement each other for a more complete analysis of the research problem" (**MSc78**).

Although comprehensive details were not available in each thesis or dissertation, it is evident that most of the studies merited the application of mixed methods research approach. All the studies analysed required some input of quantitative and qualitative data to execute. Though the proportions of quantitative or qualitative data required was not clearly indicated, the research questions could not adequately be answered using either quantitative or qualitative data alone. As explained earlier, issues such as awareness, perception, use and consequences of information resources or services have multiple perspectives which cannot be adequately examined or articulated either qualitatively or quantitatively alone. Some of the studies also covered dynamic issues, for instance, technological adoption, which required an initial exploration before being concretised into a substantive study. There were also scenarios where one set of data was required to validate another set. Therefore, it is the position of this chapter that the stud-

ies leading to the analysed postgraduate theses and dissertations warranted the use of mixed methods research. It was, however, expected that postgraduate students should analyse the contexts and needs of their studies and explicitly demonstrate the applicability of mixed methods research in them. By doing so in advance, the students show that the selection of mixed methods research approach was not accidental but deliberate.

It is also important for the students to identify and describe what is to be mixed. Is it the data, data sources, data collection techniques, data collection tools or data analysis and interpretation? An elaborate consideration of the above issues would help the students to clearly explain what is being mixed and justify the mixing. From the theses and dissertations analysed, it was not easy to understand what was mixed, how and why. Nonetheless, in most cases the students merely stated that they used both quantitative and qualitative data. Thus, it was not clear whether any meaningful mixing actually happened. This chapter argues that quantitative and qualitative research data and techniques need to be mixed and blended effectively for the desired outcomes to be realised. It is possible that a student may actually use both quantitative and qualitative data but fail to mix them adequately. Such studies would therefore not qualify to be described as having been products of mixed methods research. Undoubtedly, they will not exhibit the benefits of the mixed methods approach.

It was also observed that most of the students did not anchor their choice for mixed methods research appropriately on the philosophical underpinnings of their projects. The influence of the ontological, epistemological and axiological standpoints on the selection of the methodology was not explained by most students. Thus, the use of mixed methods research seemed to have been removed from these philosophical anchors thereby making it less founded. This was a major weakness in the application of mixed methods approach. The approach seemed to be floating philosophically, particularly for the doctoral theses. Although some students attempted to link their studies to pragmatism, this was not adequately connected to any ontological, epistemological and axiological considerations. The findings of this study concur with Coates (2021) who analysed 1,026 education articles retrieved from Education Resources Information Centre (ERIC) library and found that only 81 (7.9%) were anchored adequately on philosophical assumptions. The findings of the present study also generally agree with an earlier one by Bryman (2006) who found that only 6% of studies applying mixed methods research were founded on philosophical assumptions. Coates (2021) attributes this low application of philosophical assumptions in mixed methods research to weaknesses in research methods education.

Although most students did not indicate the type of mixed methods research they applied, it was evident that all the basic typologies identified by Creswell (2013) were applied. As explicated above, some students explained that they collected qualitative and quantitative data separately and only merged the results for interpretation. This is convergent parallel mixed methods and it was the most commonly applied approach. Sequential approaches were also implied in some studies. However, the sequences – explanatory or exploratory – were not clearly identified. It also emerged that most students predominantly collected qualitative data which was supplemented with quantitative data. This chapter argues that it is not possible to epistemologically situate mixed methods research approach without comprehensively considering the data collection process which would have a bearing on the stages of the mixing.

QUALITY OF DISSERTATIONS AND THESES GENERATED THROUGH MIXED METHODS RESEARCH

For the purposes of this chapter, the quality of the theses and dissertations was assessed through citation analysis (Atieno et al., 2021; Kwanya, 2020). The chapter is, however, conscious of the limitations of this approach. One of these is the fact that citations are influenced by multiple factors and can be manipulated. Bornmann et al. (2012) explained that citations may be determined by the subject, channel, language or contextual setting of the publication. Similarly, it may be influenced by the relative reputation and number of authors of a publication (Leimu & Koricheva, 2005). In this chapter, apart from quality, citations could be influenced by the stability of the digital repositories; popularity of the parent university; the topic of the study; the case studies selected for investigation (where applicable); and scholarly reputation of the students and/or supervisors. Holding these factors constant, however, this chapter argues that citation analysis is the best mechanism currently available for quantifying the quality of scholarly publications. This view is shared by several scholars who have pointed out that there is no mathematical or objective formula for assessing the quality of scholarly publications (Figueredo, 2006; Garfield, 2002; Harnad, 2009).

It emerged from the findings that of the 122 dissertations and theses that used mixed methods research, only twenty (20) had been cited at the time this analysis was done. These theses and dissertations had been cited for a total of 55 times. The most popular was cited 17 times while the second-best was cited 11 times. The majority (11) of the theses and dissertations were cited just once. This implies that the bulk (102; 84%) of the theses and dissertations had not been cited at all. It was also observed that the two most cited works were Master's dissertations published in 2015 and 2014 respectively on the institutional repository of a leading university, in terms of academic excellence, in Kenya. This finding corroborates Ferreras-Fernández et al. (2016) who argued that the citability of a thesis or dissertation depends on its accessibility, dissemination and visibility. Although the length of time the dissertation has been published contributes to the likelihood of being cited, this trend was not evident in the list of cited works since the earliest was published in 2009 while the latest was published in 2019.

An analysis of the citation counts for the works generated through qualitative approach yielded eight (8) theses cited a total of 17 times. The thesis which was cited most attracted seven (7) citations while the second-best was cited 4 times. The other six (6) were cited just once. Only one quantitative thesis had attracted one citation. Although many factors may be at play, it is evident from the data that theses and dissertations generated through mixed methods attracted more citations than those developed using either qualitative or quantitative methods. This chapter, therefore, concludes that mixed methods typically enable postgraduate students to produce theses and dissertations of a better quality than either qualitative or quantitative methods by reducing the effect of the weaknesses associated with applying either quantitative or qualitative research approach alone. Mixing enables the students to capitalise on the strengths of applying multiple methods. Recognising the fact that the mixed methods approach was not applied effectively by most projects, it is possible that these theses and dissertations may have attracted more citations had it not been the case.

It is important to point out, however, that it was not possible in the context of this study, to identify the papers which may have been extracted from the theses and dissertation. This is because the students may have used titles which are different from the original theses and dissertations. This is proposed for consideration for future research.

IMPROVING THE USE OF MIXED METHODS RESEARCH APPROACH BY LIS POSTGRADUATE STUDENTS IN KENYA

As explained earlier, library and information science is a multidisciplinary field of study. Indeed, Pluzhenskaia (2007) argued that LIS scholars are drawn from a wide range of diverse fields. An annual report by the Association for Library and Information Science Education (ALISE) (2003) reported that LIS scholars come from 34 disciplines thereby demonstrating epistemological connections between LIS and other disciplines. According to Milojević et al. (2011), the discipline is changing rapidly and adopting more branches as it continues to advance. This view is shared by several other scholars (Fiala, 2013; Ge, 2010; Lemieux, 2016; Rieh & Danielson, 2007). It is, therefore, a natural home for mixed methods research. In spite of this potential, Fidel (2008) reported that the approach has not been widely used in LIS. Whereas the use of mixed methods research has been implied in the discipline, many LIS scholars have not explicitly reported this use. Therefore, improving the application of mixed methods research by LIS postgraduate students will inevitably begin with promoting the approach among them. Although taking a prescriptive approach to this is undesirable, conversations about whether there is need to "officially" adopt mixed methods research as the preferred methodological approach in LIS scholarship in Kenya may perhaps be entertained. This may lead to intensive and extensive dialogue about the approach and how to apply it effectively in LIS thereby generating locally-suitable frameworks for its application. Ultimately, this may result in the promotion of the approach amongst LIS postgraduate students and supervisors in Kenya.

One of the concerns discernible from the findings of this study was the difficulty the students seemingly had explaining what was mixed and how. These findings concur with Mabila (2017) that most postgraduate students who utilise mixed methods in their research often find it difficult explaining and justifying why or how the approach was best suited for their work. Indeed, Granikov et al. (2020) identify poor articulation of mixed methods research output and suggests that more effort should be invested in improving both the conduct and reporting of mixed methods research in LIS. The above conversations could pursue such matters and develop a clear understanding of the mixing options possible and how these could be applied in LIS. For instance, Creswell et al. (2011) explained that mixing of data in mixed methods research can occur through three processes which are; merging, connecting and embedding. They averred that merging occurs when qualitative and quantitative data is collected separately and merged at the end. Connecting data occurs when researchers collect one set of data, whether qualitative or quantitative, and use the results to inform subsequent data collection. The authors further explained that data is embedded when one set is used to supplement another set. Klassen et al. (2012) proposed the concept of meta-inference as a means of generating premium value of qualitative and quantitative data collected in mixed methods research. Venkatesh et al. (2013) argued that the integrative value of mixed data can be understood through meta-inference. They explained that meta-inference not only enables the mixing of data and research designs but also the interpretation of the findings therein. Therefore, LIS scholars in Kenya need to take a position about the mixing approach, or approaches, which stand a higher chance of enabling a true understanding of research issues investigated through mixed methods approaches.

Another issue requiring scholarly dialogue is the philosophical underpinnings of mixed methods research and how they relate to LIS research. It is evident from the findings that students seem to have experienced a challenge while developing suitable philosophical or theoretical frameworks and linking them clearly to their choice of mixed methods research. Although pragmatism was selected as the most appropriate philosophy for mixed methods research, in most cases, the selection was poorly founded on

appropriate philosophical assumptions. The students seemed to merely drop it in a "by-the-way" manner without adequately elucidating its fit with either mixed methods research or the research questions. Numerous questions in this regard are worth investigating. For instance, are there scenarios where pragmatism does not fit well with the aims and questions of specific research projects? Would LIS research in Kenya require a mixing of philosophies going beyond pragmatism? These are issues, though outside the sphere of this chapter, that need to be investigated and discussed.

The concept of validity in mixed methods research as applied in LIS postgraduate research in Kenya also needs further clarification. In nearly all cases, how the data truthfulness was ensured in the studies was not adequately explained. It emerged that the students largely applied the quantitative mechanisms of assessing and ensuring validity. This is limiting and does not facilitate the realisation of the optimum benefits of mixed methods approach. Legitimation has been proposed as a better means of addressing truthfulness in mixed methods research. Scholars such as Onwuegbuzie and Johnson (2006) as well as Teddie and Tashakkori (2006), among others, have proposed possible legitimation mechanisms but their applicability in the Kenyan context needs further clarification. There is need for discussions on the concept of legitimation and how it could be applied in LIS research in Kenya. This would help postgraduate researchers to adequately address truthfulness in their research and thereby enhance the quality of theses and dissertations.

CONCLUSION

From the foregoing, it is evident that mixed methods research is the most popular approach applied by library and information science postgraduate students in Kenya. In fact, more than one in every two students applied mixed methods research. Despite this evident popularity, some students did not identify their methodological approach as mixed methods choosing to use terms such as "quantitative/qualitative" studies instead. The lack of a clear identification of mixed methods research may be an indication of an inadequate understanding of the approach by the students. Although LIS, being multidisciplinary, is a natural home of the approach, the students were mainly drawn to mixed methods as a means of maximising the strengths of quantitative and qualitative approaches while minimising their weaknesses. Information on how the students used mixed methods was inadequately provided. However, it emerged that most students collected both qualitative and quantitative data concurrently and then merged them at the analysis stage. The rationale for this mixed methods approach was not adequately explained. In spite of the challenges in applying mixed methods in library and information science postgraduate research, theses and dissertations developed using the approach were cited most thereby implying that they were of a better quality than those generated with either quantitative or qualitative approaches. It can be concluded, therefore, that the use of mixed methods research typically enhances the quality of library and information science postgraduate theses and dissertations in Kenya. This chapter recommends further discourse on mixed methods research in terms of its nature (what is mixed, when, how), application in library and information science research, philosophical underpinnings and legitimation. These discussions are likely to yield best practices which will facilitate effective consideration and application of mixed methods research by library and information science postgraduate students in Kenya.

PRACTICAL IMPLICATIONS

The content of this chapter can be used by:

1. Library and information science postgraduate students when selecting and applying their research approaches;
2. Supervisors of postgraduate students when mentoring the library and information science students on the appropriate use of research approaches, including mixed methods research;
3. Library and information science schools in enriching research methodology course content in the curricula of their postgraduate academic programmes;
4. Library and information sciences scholars studying or recommending specific research methodologies in the discipline; and
5. Examiners of library and information science postgraduate research work when assessing the suitability of methodologies applied in specific research projects.

LIMITATIONS OF THE STUDY

As indicated earlier, many factors, besides quality, influence the citability of publications. It was not possible to analyse these comprehensively in the scope of this chapter. Thus, they were held constant for the arguments made in this chapter. In real life, however, it may not be possible to hold them constant. Therefore, this chapter recommends that these issues be investigated by future studies in order to paint a complete and clearer picture of the quality of postgraduate LIS theses and dissertations in Kenya developed through mixed methods research.

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