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Mapping Supervision Trends in Doctoral Research in Library and Information Science in Nigeria and South Africa: Implications for Collective Learning

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Abstract

Research supervisors are indispensable to the production of postgraduate research. Using the Activity Theory and the Scholarship of Integration Framework, this qualitative content analysis study investigated trends in supervision of doctoral research in library and information science at selected universities in Nigeria and South Africa between 2009 and 2015. A total of 108 doctoral theses from 10 selected universities in Nigeria and South Africa whose research outputs were deposited in the Directory of Open Access Repositories were used as the sample for this study. Sole supervision predominated the supervision trends. The main subject areas of research were information studies in both countries and knowledge management and records management in South Africa. It is recommended that supervisors and policymakers in the two countries consider other postgraduate supervision models including collaborative supervision. There is mounting evidence that collaborative supervision has superior benefits for both the supervisors and the students, compared to the dyadic supervision model. Collaborative supervision promotes quality scholarship and reasonable completion times. It also has implications for collective learning and building capacity of postgraduate supervisors.

Keywords: Research Supervision; Doctoral Research; Library Science Research; Collaborative Supervision; Research Output.

Introduction

Research supervisors play a crucial role in the support of research higher degree students. Aina (2017), Hodza (2011), Mouton (2011) and Oredein (2008) identify the supervisor as the single most important factor that influences the success or failure of a research higher degree and the quality of the product. Although it is debatable, the argument in some circles is that the quality of postgraduate outputs is as good as the supervisors who guide the students through the research process (Swart, 2018). This underscores the pivotal role that supervision plays in the successful conducting of postgraduate research.

This study examined supervision practices in library and information science (LIS) doctoral education in Nigeria and South Africa. The characteristics of doctoral supervision were examined in order to determine how knowledge is produced in support of the growth of the discipline and the innovation system of society. However, measuring completion rates was beyond the scope of the study reported on here as a result of the limitations imposed by the research methodology adopted in this inquiry and the availability of data. For instance, most of the research outputs do not indicate the date the study was commenced. The study used a single research

method which limited the ability of the researchers to explain some of the results.

Existing literature demonstrates that there is limited research on the development of higher degree students and research training in LIS in sub-Saharan Africa (SSA), based on research outputs and research outcomes (Mutula and Majinge, 2017). This study sought to bridge that gap and contribute to the understanding of supervision patterns in a specific context. Conducting studies to understand the pattern of research and scholarly communication needs to be done constantly to inform practice (Aina and Mooko, 1999). The current study has implications for supervision practices at doctoral level.

Using qualitative content analysis, doctoral supervision trends in LIS departments in selected universities in Nigeria and South Africa are discussed. This study used bibliographic records to determine the content of theses. Germane to this inquiry were 108 doctoral theses that were completed between 2009 and 2015 in LIS departments in selected universities in Nigeria and South Africa, which were available in the Directory of Open Access Repositories (n. d). This study answers the question: What are the supervision patterns in postgraduate LIS research in Nigeria and South Africa?

Conceptualising Supervision

Research is fundamental to the growth and development of any discipline and any country. It helps institutions to respond to global and national challenges (Academy of Science in South Africa, 2010). This partly explains why higher education research has been one of the sites of major policy interventions (Wisker and Robinson, 2016). Doctoral qualifications have the potential of producing skilled researchers that could contribute to the knowledge economy that is predominant nowadays (Fourie-Malherbe et al, 2016).

Research supervision has been in the spotlight, especially in South Africa, in recent times for various reasons (ASSAf, 2010; Mouton, 2011; Ngulube, 2017; Samuel and Vithal, 2011). Apart from concerns with matters such as completion rates and supervision relations, there has been concern over the quality of postgraduates produced by the higher education research systems, and the need has been identified to understand supervisory practices and address the inefficiencies in the systems (Ngulube, 2017). Supervisors are gatekeepers of rigour and quality in research and facilitate the brokering and breaking of boundaries in new knowledge (Wisker and Robinson, 2016). Sufficient and effective supervision is essential for successful postgraduate research.

Supervision has been identified as one of the challenges in postgraduate research, especially in Southern Africa in the LIS field (Mutula, 2011). However, research on LIS postgraduate supervision in SSA is far from extensive. A handful of studies have been carried out to understand LIS supervision in SSA. Mutula (2009) conducted a study to determine the relationship between postgraduate students and their supervisors. Aina (2015) surveyed 45 doctoral graduates in LIS of universities in Nigeria who completed their studies between 2009 and 2013 in order to determine the factors affecting the timely completion of their programmes. In a related study, Aina (2017) investigated the supervisors' perceptions of LIS doctoral degree programmes in Nigeria with a focus on the role that supervisors played in the completion of PhD studies. Using a sample of 38 supervisors from 11 universities, one of the specific objectives of the study was "to determine the profile of LIS supervisors of doctoral degree programmes in Nigerian universities with respect to academic qualifications, status and experience." The results from the study by Aina (2017) did not fully address the objective as it is evident from the four hypotheses and the results. Otubelu (2010) conducted a bibliometric analysis of 747 postgraduate research reports in LIS in Nigerian universities from 1993 to 2006. The scope of previous studies on research outputs differs significantly from the scope of the current study. The current study focused is on supervision trends in two countries and the differences in the patterns across the countries.

Supervision of doctoral graduates may be conducted by a single supervisor or multiple supervisors. Multiple supervision can take the form of co-supervision (joint supervision) or committee supervision, with the latter being common in North America and the former being prevalent in countries which have adopted the United Kingdom and European doctoral models (Spooner-Lane et al, 2007). Team supervision, which involves two or more

supervisors sharing the responsibility for a postgraduate student, has been offered as one of the strategies for dealing with some of the difficulties experienced by postgraduate students in the sole supervision model (Paul, Olson, and Gul, 2014; University of South Australia, 2016).

Multiple or team supervision may be ideal in cases where the problem under study is multidisciplinary or where novice supervisors are being mentored by experienced and senior faculty members. Consequently, many universities advocate multiple, team, or joint supervision (Lahenius and Ikävalko, 2014), which has been adjudged by some researchers as an effective and efficient supervision model (Coulton and Krimmer, 2005; Dysthe, Samara, and Westrheim, 2006). Multiple supervision is used in the context of the European and the United Kingdom doctoral model and excludes the United States advisory panels or committees approach because the two models are slightly different (King, 2016).

All these supervision arrangements have advantages and disadvantages. Being mentored by multiple supervisors may be detrimental to the experiences of postgraduate research students. For instance, it may expose students to conflicting perspectives of supervision owing to personality clashes, paradigm differences and differing supervision styles of the mentors. However, it provides better opportunities for critical thinking by students than individual supervision. Collective supervision has the added advantage of facilitating the convergence of a number of minds and leads to knowledge exchange among a wide variety of experts and, at times, novices (Ngulube, 2017).

Though co-supervision has a number of advantages, it is more prevalent in the natural sciences than social sciences (Fenge, 2012; Pole, 1998). Perhaps, it is incumbent upon social scientists to embrace multiple supervision models in the wake of the growth of interdisciplinarity in many academic spaces. Academic disciplines are transforming from the solo mode to working with other disciplines due to factors such as the need to understand the rising complexity of social phenomena and the tendency towards convergence.

The next section outlines the problem statement which provided the glue that holds together the presentation of argument, method and analysis of results in this study (Hernon and Metoyer-Duran, 1993; Hernon and Schwartz, 2007; Stansbury, 2002).

Problem Statement

Supervision has been identified as one of the key factors contributing to the success of postgraduate students. There are a number of supervision styles (Cullen et al, 1994). Three structures of supervision are the single supervisor, two supervisors, and a team of supervisors consisting of at least three members, with one acting as the chairperson or the main supervisor (Tahir et al, 2012). A study of the structure of supervision patterns may shed light on supervision practices in LIS in context. However, little is known about supervision patterns in South Africa and Nigeria. In order to address the problem statement, the following five research questions were formulated:

- What are the trends in doctoral supervision in each country?
- What are the main subject areas of supervision in each country?
- What are the main subject areas of supervision and status of leading supervisors in each country?
- How prevalent is team supervision in each country?
- What are the implications of the supervision culture for collective learning?

Conceptual Framework

Following Antonenko (2015) and Ngulube (2018), the conceptual framework that informed this study resulted from pulling together concepts from Activity Systems Theory, Boyer's model for scholarship (1990), and personal perspectives and experiences of the researchers as supervisors of postgraduate students. Activity Systems Theory supports the "development of the practices" being investigated (Blackler, Crump, and McDonald, 2000). The practice under the spotlight is graduate research supervision.

Although Activity System Theory has six constructs (Engestrom, 1987), this study employed only two that were considered relevant to the study. The understanding of the relationship between community of practice and division of labour

constructs assisted the researchers in exploring "the nature and dynamics of particular activity systems and the trajectory of their development" in context (Blackler et al, 2000).

Supervisors are involved in the activity of supervision. Producing X number of postgraduate students is linked to supervision practice as an activity system. The division of labour and working together leads to the emergence of a community of practice in the Wengerian sense (Lave and Wenger, 1991). Division of labour is apparent in sharing supervisory roles and knowledge to the benefit of the students and the academics (Lee, 2012). This construct in activity theory resonates with the scholarship of integration in Boyer's model for scholarship (1990). The model advocates the connection of peers with one another through practices and social relationships across disciplines. Connecting peers may create conditions for knowledge sharing and organisational learning, which are regarded as key to the performance of an organisation (Farooq, 2018). That may also provide an opportunity for postgraduate students to receive more efficient services than in an environment where there is no division of labour among supervisors, and there is a lack of scholarship of integration of diverse expertise and academic networks.

The selected universities in the two countries set the structural context in which the supervision took place. The concern in the structural context was with the number of outputs produced and how the supervisors went about the production of these outputs. Addressing these concerns was going to reveal the patterns of the supervision activity. Furthermore, Nigeria and South Africa are culturally different as a result of their history and other diverse structural factors emanating from the context and the available resources. It was of interest to find if the supervision culture in the two countries was different.

Methodology

Doctoral outputs from Nigeria and South Africa were pertinent to this study. Besides being the two economic powerhouses in SSA, the earliest LIS postgraduate programmes in Anglophone Africa were established in universities in Nigeria and South Africa (Ocholla, 2000). The year 2009 was arbitrarily chosen as a beginning point. The cut-off date for the analysis was 2015. This was longer than the five-year span that is recommended for determining changing patterns in research outputs (Stansbury, 2002). The assumption was that the chosen time span could be used to identify trends in the supervision of LIS research in context.

The Librarians' Registration Council of Nigeria (2018) lists 25 accredited LIS schools in Nigeria. However, the research outputs that were available in the Directory of Open Access Repositories (n.d.), which was the sample frame, included the University of Ilorin, Ahmadu Bello University, and the University of Nigeria, Nsukka. The study was confined to Ahmadu Bello University and the University of Nigeria because the University of Ilorin did not upload theses but only uploaded articles, and the Federal University of Technology, Minna, only uploaded abstracts of undergraduate theses at the time of the study (2018).

Only two Nigerian universities were included in this study because of the unavailability of data. Aina (2015) laments the difficulty of determining the number of LIS doctoral graduates produced by universities in Nigeria due to a lack of data. In the context of Australia, Macauley et al, (2005) underscore the importance of having a comprehensive database of PhD outputs in any country to understand doctoral education and the nature of scholarly communication in context.

There is no agreement as to the number of LIS schools in South Africa due to name changes and the change in the focus of the programmes. According to Ocholla and Bothma (2007), there are 12 LIS schools in South Africa hosted in various public universities. Hlongwane (2014) describes 10 LIS schools, excluding Stellenbosch University and the University of Johannesburg, which were on the list of Ocholla and Bothma (2007). Although Maluleka and Onyancha (2016) and Raju (2014) also exclude Stellenbosch University, they include the University of Johannesburg in their list of LIS schools in South Africa. Stellenbosch University was excluded from the sample of this study. The researchers were convinced that it was not LIS-centric. The 10 university repositories that were captured in the Directory of Open Access Repositories (n.d.) include the repositories of Durban University of Technology, the University of Cape

Town, the University of Fort Hare, the University of Johannesburg, the University of KwaZulu-Natal, the University of Limpopo, the University of Pretoria, the University of the Western Cape, the University of South Africa, and the University of Zululand. It is noteworthy that the University of the Western Cape and the University of Limpopo did not deposit any theses between 2009 and 2015. This means that a sample of eight universities from South Africa was considered for the study in contrast to two from Nigeria.

The research outputs were downloaded from the repositories of the Directory of Open Access Repositories. They were cleaned up by opening them one by one to ensure that the completion dates in the thesis were between 2009 and 2015. Those that were downloaded but were not within the study scope were deleted, leaving a total of 73 doctoral theses from 8 universities in South Africa and 35 theses from 2 universities in Nigeria, accounting for the 108 outputs that were studied. In a study of the shortcomings of LIS doctoral theses, Mutula and Majinge (2017) analysed 36 theses produced between 2008 and 2016 from 15 selected universities in Kenya, Uganda, Botswana, Ghana, and South Africa. This implies that our sample was within acceptable limits.

Data was triangulated through checking whether the number of records downloaded from the Directory of Open Access Repositories matched the records on the websites of universities and the NEXUS database, in the case of South Africa. The validation process identified many discrepancies. The researchers discovered a few errors or omissions in some instances. Strategies to ensure that bibliographic records in various databases match each other should be devised by database managers and administrators so that data mining yields comparable results. The implication is that the dataset is an underestimation of the real situation. However, the available data still shed light on the state of scholarly communication in LIS knowledge production in South Africa and Nigeria.

Traditional content analysis, which relies on human coders using a predefined coding scheme, was used (Gummer, Blumenberg, and Roßmann, 2018). The taxonomies used in the coding were those based on existing literature and previously determined themes (Pandita and Singh, 2017; Wilkinson, Van Jaarsveldt, Grimsley, and Seoka, 2016). The specified variables were "country", "university", "year of publication", "thesis title", "type of output" (whether master's or doctoral), "supervisor(s)" and "subject areas". The two researchers coded the data independently. A 99% coding agreement was achieved. This implies that the coding scheme was acceptable within reasonable limits. Descriptive statistical methods comprising frequency and percentage were used to present the results. The coded data was entered into Excel and analysed.

Findings of the Study

Based on activity theory and the integration of scholarship concept, this section outlines what supervisors did, how, and the implications for collective learning. Following on Pandita and Singh (2017), the names of the universities were not anonymised, as these names are already in the public domain.

Trends in Doctoral Supervision in Each Country

The findings reveal that 51 supervisors supervised 108 theses. The mean score is 2.12. Table 1 outlines the supervision patterns in the selected universities in Nigeria and South Africa. The supervision cultures in Nigeria and South Africa are varied, but sole supervision culture predominates. Sole supervision is above the mean (7.4) at all the universities under study, except at the University of Nigeria, the University of South Africa, and the University of KwaZulu-Natal. It is apparent that the cultural differences between the two countries did not lead to any significant differences in the supervision patterns.

In Nigeria, team supervision was prevalent at Ahmadu Bello University. In fact, only one out of the six research outputs produced by the university was supervised by a single supervisor, who was a doctoral holder. Other doctoral holders at the same institution practised team supervision. Not a single thesis was supervised collaboratively at the University of Nigeria. Four professors and three doctoral holders were involved in sole supervision at the university. On one hand, this may imply that the scholarship of integration was limited as supervisors

were not tapping into one another's expertise. On the other hand, it may be due to the fact that some of the areas of research may be outside the scope and expertise of the supervisors, among other reasons.

In South Africa, the University of South Africa was equal with Ahmadu Bello University in practising team supervision. The University of Zululand was in the lead when it came to team supervision in South Africa, with the University of KwaZulu-Natal at its heels. The researchers prefer using the term "team supervision" to using co-supervision because the results reveal instances where students were guided by more than two faculty members. For instance, there were two cases at the University of KwaZulu-Natal where the students were guided by three faculty members, and one case each at the Universities of Zululand and South Africa.

There were only two instances in South Africa (i.e. the University of Johannesburg and the University South Africa), where doctoral holders supervised students without formally tapping into the collective wisdom and experience of others. Doctoral holders co-supervised with professors at the Universities of KwaZulu-Natal and Zululand. As in Nigeria, some professors co-supervised among themselves in South Africa. According to Aina (2017), supervision is a critical process in postgraduate education, involving experienced senior academics. Doctoral holders can barely be regarded as senior academics. Professors and associate professors are generally regarded as senior academics. A study by Aina (2015) reveals that most of the PhDs surveyed in Nigeria were supervised by professors and associate professors. The use of non-professorial supervisors was limited to only two universities. The results of the current study paint a more or less similar picture.

Table 1: Trends of doctoral supervision (N = 108)

Country	Institution	Number of theses	Sole supervision	Team supervision
Nigeria	Ahmadu Bello University, Zaria	6 (5.56%)	1 (1.35%)	5 (14.7%)
	University of Nigeria, Nsukka	29 (26.85%)	29 (39.19%)	–
South Africa	Durban University of Technology	2 (1.85%)	1 (1.35%)	1 (2.94%)
	University of Cape Town	1 (0.93%)	1 (1.35%)	–
	University of Fort Hare	1 (0.93%)	1 (1.35%)	–
	University of Johannesburg	4 (3.7%)	2 (2.7%)	2 (5.88%)
	University of KwaZulu-Natal	24 (22.22%)	16 (21.62)	8 (23.53%)
	University of South Africa	17 (15.74%)	12 (16.21%)	5 (14.7%)
	University of Pretoria	13 (12.04%)	9 (12.16)	4 (11.76%)
	University of Zululand	11 (10.19%)	2 (2.7%)	9 (24.47%)
	Total	108	74	34 (31.48%)
	Mean	10.8	7.4	3.4

As shown in Table 1, only the Universities of Cape Town and Fort Hare practised sole supervision. More evidence is being produced to demonstrate that dyadic supervisory practices are gradually losing ground to collective or multiple supervision (Agné and Mörkenstam, 2018; Guerin, Green, and Bastalich, 2011). Zuber Skerritt (1992) states that most of the problems related to assisting postgraduate students in completing their studies successfully stem from the single supervisor model. Buttery et al, (2005) confirm that single supervisor arrangements are grossly unsatisfactory. One conclusion from the literature is that co-supervision is likely to be the norm as a result of a desire for interdisciplinary research, which has the potential to maximise innovation in knowledge-based economies (Grossman and Crowther, 2015) such as those of South Africa and Nigeria.

Main Subject Areas of Supervision in Each Country

A wide range of subject areas were supervised as shown in Table 2. Subject areas can be classified in various ways. The classification of the main subject areas used in this study was based mainly on Pandita and Singh (2017). While we concede that all classification devices reflect the explicit and the implicit biases of those who devise them, we found the classification of these two authors instructive.

Library management was not a popular research area as its incidence was not more than two in both countries. This was contrary to the findings of Otubelu (2010) which revealed that the subject area was dominant in Nigeria at doctoral level. The difference in the results may be partly explained by either differences in the classification schema or the periods that the studies cover. The knowledge management area and its various facets seem to be gaining ground in universities in South Africa, as shown in Table 2. No thesis of the knowledge management area was recorded in Nigeria. Studies on records and archives were also not recorded in Nigeria. Otubelu (2010) also found out that records and archives were rarely researched in Nigeria during this period. Table 2 shows that a number of records management studies were recorded in South Africa, with the University of South Africa leading.

The research sub-areas listed in Table 2 for South Africa partially resonate with the findings of Mutula and Majinge (2017). Mutula and Majinge (2017) identify information behaviour, artificial intelligence, library automation, technology acceptance and use, information management, knowledge management, information needs and information-seeking behaviour, small business enterprises, information literacy, digital libraries, institutional repositories, scholarly publishing, records management, ethics, collection development, e-learning, business intelligence, information needs of SMEs, electronic information resources, and LIS curriculum development as the topics covered by the doctoral research outputs that they analysed. As in Africa, information-seeking behaviour (information studies) was one of the three core research areas in LIS doctoral research in North America (Sugimoto et al, 2011).

Table 2: Main Subject Areas of Supervised Theses

Year	Main subject area	2009	2010	2011	2012	2013	2014	2015
Nigeria	Information technology	–	Use in scholarly communication (2)*	Digital preser-vation	–	–	–	Policy and acquisition
	Information studies	–	Information resources and services Information literacy	–	Information resources and services Information needs and information-seeking behaviour (2)	Information resources and services Information literacy Information needs and information-seeking behaviour (2)	Information resources and services (9)	Information resources and services
	Library studies	–	–	–	–	School libraries (2)	–	–
	Metric studies	–	Bibliometrics	–	–	–	–	–
	Resources and services studies	–	Grey literature	–	–	Reference services User satisfaction	–	–
	Library management	–	Marketing	–	–	–	–	–
	LIS profession and professionals	–	Job satisfaction	–	–	–	–	–
South Africa	Information technology	–	–	Data curation E-gover-nance	E-schools E-learning Diffusion	E-resources	Acceptance E-resources	Web technologies Mobile technologies Digital preservation
	Records and archives	–	–	Records manage-ment	Records manage-ment	Archives management Records management	–	Records management (2) Archives administration
	Information studies	–	–	Infor-mation literacy	Information literacy (2) Information system	Information system Information needs and information-seeking behaviour (2)	Information needs and information-seeking behaviour (3)	Information system Information needs and information-seeking behaviour (3)

Table 2: (Cont'd)

Year	Main subject area	2009	2010	2011	2012	2013	2014	2015
				Information needs and information-seeking behaviour (2)				Information literacy
	Knowledge management	Knowledge management	Knowledge management (2)	Knowledge management	Knowledge management (2)		Knowledge management	Knowledge management (5)
		Competitive intelligence	Business intelligence	Business intelligence	Indigenous knowledge systems		Business intelligence	Indigenous knowledge systems
	Library studies		–			University presses	Academic libraries	
							School libraries (2)	
							Public libraries	
	Metric studies		–	Informatics		Scientometrics		Scholarly content
	Resources and services studies	User satisfaction	–		Legal deposit	Branding of services		
	Library management		–	Quality management			Quality management	
	LIS profession and professionals		–					LIS curriculum
								Human resources development

* Indicates a frequency of more than one of the occurrence of the coverage, the frequency is 1 by default

Main Subject Areas Supervised and Status of Leading Supervisors

For a person to be recognised as a leading supervisor, they would have supervised more than two students either jointly or individually. The figure of two is based on the mean of the number of doctoral students supervised during the period under review. The subject areas varied as illustrated in Table 3. The leading supervisors seemed to prefer sole supervision to team supervision, except for supervisors from the University of Zululand and Ahmadu Bello University.

The h-index of the supervisors was between 1 and 27. This index shows the impact of an author in a particular field. The low h-index seems to suggest that most of the leading supervisors had not made a significant impact in the subject areas in which they supervised. However, Harzing (2007) warns that even if the h-index may be used as a measure of a person's impact in a certain field, it may not be accurate for a variety of reasons, including the avenues that the authors use to disseminate their research outputs. Google Scholar was used to identify the impact of each supervisor, and it is assumed that it gives a fair picture of this impact. Supervisors are expected to be leaders in their fields with a sound publication record. More research is needed to determine the correlation between the impact of a supervisor, their impact in a certain research field and their performance as supervisors.

Prevalence of Team Supervision in Each Country

The results in Table 4 show that the team supervision prevalence rate in Nigeria was 4.6% and 26.9% in South Africa was The supervision trends are skewed towards sole supervision.

Table 3: Leading supervisors in the sampled institutions

Country	Institution	Supervisor	Subject area	No of Students		H-index (Google Scholar)
				Sole	Team	
Nigeria	Ahmadu Bello University	A*	Information studies	0	4	2
		B	Information studies	0	3	1
	University of Nigeria	C	Information studies	18	0	6
			Resources and services studies			
			Metric studies			
			Information technology			
			Library management			
		D	Information studies	7	0	4
South Africa	University of Johannesburg	E	Information studies	1	1	10
			Information technology			
	University of KwaZulu-Natal	F	Information studies	8	3	26
			Knowledge management			
			Resources and services studies			
			Information technology			
		G	Information studies	5	4	6
			Resources and services studies			
	University of Pretoria	H	Library Studies	3	0	12
		I	Knowledge management	1	2	2
	University of South Africa	J	Resources and services studies	6	3	27
			Knowledge management			
			Records and archives			
			Information technology			
		K	Records and archives	4	1	6
	University of Zululand	L	Knowledge management	2	8	23
			Information studies			
			Information technology			
			Metric studies			
		M	Information studies	0	4	10

* Names were anonymised for ethical reasons

Table 4: Team supervision patterns in Nigeria and South Africa (N = 108) per year

Date	South Africa		Nigeria		Totals	
	Sole	Team	Sole	Team	Sole	Team
2009	2	3	1	0	3	3
2010	2	1	6	1	8	2
2011	7	3	0	1	7	4
2012	3	7	2	1	5	8
2013	3	7	7	1	10	8
2014	7	8	7	1	14	9
2015	20	0	7	0	27	0
Total	**44 (40.7%)**	**29 (26.7%)**	**30 (27.8%)**	**5 (4.6%)**	**74 (68.5%)**	**34 (31.5%)**

The overall team supervision prevalence rate was 31.5%. Although the sample was relatively low, the results are corroborated by previous research. In a related study in Nigeria, Aina (2015) reveals that 80% of the respondents had a sole supervisor. Only three universities employed co-supervision and accounted for the 13.3% co-supervision rate. This seems to confirm the fact that team supervision is low in the social sciences (King, 2016; Pole, 1998).

The implication of these results is that most research students were not provided with a "multi-faceted support network" (Guerin et al, 2011) during their studies, or exposed to "multivoiced" supervision (Dysthe et al, 2006). In essence, this deprives doctoral students of a diversity of perspectives and expertise (King, 2016). The low prevalence rates of co-supervision may also be inimical to completion rates of postgraduate students (Guerin et al, 2011; Wisker, 2012). Humphery (2011) and Ives and Rowley (2005) identify co-supervision as one of the factors that improve the chances of students completing their studies quickly. For instance, Humphery (2011) reveals that 54% of students who were guided by supervisory teams submitted within 4 years, compared to 32% of students with a sole supervisor. Also, a high number of students who were supervised by a sole mentor dropped out of their studies. On the other hand, Ives and Rowley (2005) found that students that were co-supervised were likely to progress well and be satisfied. However, team supervision on its own does not guarantee fast completion rates. There are other factors that may come into play such as mode of study, level of preparedness, and available resources (Aina, 2015; Mutula and Majinge, 2017; Ngulube, 2017).

In that regard, team supervision should be encouraged in LIS in Nigeria and South Africa in order to provide students with a broader range of networks and resources, expose them to a range of supervisory styles, and improve student completion rates as articulated in the literature (King, 2016).

A study conducted in LIS schools In East, Central and Southern Africa on the supervisor-supervisee relationship among postgraduate students revealed that 56% of the respondents preferred a single supervisor against 32% who favoured more than one supervisor (Mutula, 2009). The study gives credence to the need to consider alternative supervision models such as team supervision as suggested by this study.

Team supervision gives new supervisors an opportunity to be mentored in the practice of supervision and provide for the division of labour in supervision (see King, 2016) for the benefit of the students. The division of labour is in line with one of the constructs of Activity System Theory. For the division of labour in supervision implies that supervisors share the load of providing intellectual and administrative support, mentoring the student and ensuring continuity of supervision. Co-supervision will assist the beginner supervisors in becoming familiar with the pedagogy of graduate supervision and make the entrants productive and efficient supervisors. The interaction with other supervisors may also create

an opportunity to reflect upon and improve their practice. Ultimately, this will transform the practice of supervision from being a predominantly private activity between the sole supervisor and the student to being more of a professional activity (Manathunga, 2014).

There is evidence that even if the team supervision model is found to be less attractive; at least first-year doctoral students should be supervised collectively as that "creates a wider academic learning context, allows doctoral students to gradually acquire the values and behaviours of a research practice community, and reduces the risk of premature selection of permanent supervisors" (Agné and Mörkenstam, 2018). The fact that there is no consensus on the ideal supervision implies that more research is needed in this area. Lahenius and Ikävalko (2014) are of the opinion that although co-supervision has the potential of assuring quality in supervision, it has attracted inadequate attention.

Implications of the Supervision Patterns for Collective Learning

The supervision culture in the two countries has implications for Boyer's model for scholarship (1990) relating to the scholarship of integration. The scholarship of integration advocates the connection of peers with one another through practices and social relationships across disciplines. Team supervision as an activity creates a forum where "learning conversation about supervisory practices" may take place (Wisker, 2012). This enables supervisors to learn the art of supervision collectively. It also provides supervisors with an opportunity to share their vision of quality supervision and management practice. Collaborative inquiry and the solution of supervisory problems are highly likely where team supervision exists. The integration of scholarship is the ultimate result as peers connect through the activity of supervision.

Connecting peers may create conditions for learning through knowledge sharing. Accordingly, "better and purposeful sharing of useful knowledge translates into accelerated individual and organisational learning and innovation through the development of better products" that enhance performance (Reige, 2005). However, the organisational culture, interpersonal trust and reward system may affect knowledge sharing in an organisation (Farooq, 2018; Ngulube, 2005). Individuals might not share their knowledge unless opportunities are provided. Organisations must create conditions for knowledge sharing and transfer. Co-supervision may create such conditions. The low prevalence rates of co-supervision imply that LIS supervisors in Nigeria and South Africa have limited chances of sharing knowledge. Co-supervision may facilitate the sharing of the supervisors' collective experience, leading to effective quality in the delivery of education. Knowledge sharing may also result in innovation and sharing of best practices facilitating learning and enhancing the organisation's ability to achieve its mandate. The habit of knowledge sharing leads to successful scholarship and effective organisational learning.

Conclusions and Recommendations

This study investigated postgraduate supervision in LIS in South Africa and Nigeria. It adds to the existing understanding of supervision patterns and their implications for the innovation system. The results support the salience of Activity Theory and Boyer's model for scholarship in explaining research supervision trends in LIS education in South Africa and Nigeria. Although these are multiple case studies whose results may not be generalised to many contexts, the study illuminates postgraduate supervision in any context that has adopted the United Kingdom or European doctoral approach.

The findings show that sole supervision dominates doctoral research in LIS in Nigeria and South Africa. The main subject areas in which supervisors provided guidance were information studies in both countries, and knowledge management and records management in South Africa. Although the dyadic supervisory model remains common, alternative models such as team supervision should be considered. Team supervision is beneficial to both students and research supervisors. It also provides students with services of a high quality.

The leading supervisor seems to have a varied impact on their subject fields. Leading supervisors should live by example and mentor other supervisors by considering team supervision in contrast to sole supervision. This may lead to the integration of scholarship in the sphere of supervision and facilitate collective learning from each other.

Finally, the methodological limitations of this study necessitate further studies. The sample that was used was limited, especially in Nigeria. One methodology was used, which resulted in a limited explanation of the results. The use of multiple methods and diverse samples may help to unravel the complex phenomenon of research supervision.

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