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Supervision Practices in Library and Information Science Postgraduate Research in Nigeria and South Africa

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Abstract

In this study, supervision practices in library and information science departments in Nigeria and South Africa were examined. The sample framework consisted of master's dissertations and doctoral theses, completed from 2009 to 2015, which were available in the Directory of Open Access Repositories. Qualitative content analysis was used to generate the data used for the study. The data was presented in tables. The main findings showed that the majority of the theses and dissertations were sole-supervised. Co-supervision was more prevalent in dissertations than in theses. The major subject areas of the co-supervised theses and dissertations were information sources/studies and user services; while the major subject areas for sole supervised theses and dissertations were user services, records/knowledge management and information sources/studies. A few master's degree holders worked together as co-supervisors, but most co-supervision involved collaboration between professors and doctorate holders. In contrast to sole supervision, co-supervision is recommended because it provides an opportunity to share knowledge and learn by doing while enhancing the learning and research experience of students.

Keywords: *Supervision Practices, Co-Supervision, Sole Supervision, Postgraduate Research,*

Introduction

The supervision of students' research is of interest and concern to decision-makers at universities because supervision is related to the successful outcome of students and it enhances the reputation of the institution (Vilkinas, 2008). Proper supervision is essential to ensure the production of high-standard output. Good supervision is a factor in the successful and timely completion of postgraduate studies (Aina, 2015; Tahir, Ghani, Atek and Manaf, 2012). Inadequate supervision plays a role in the non-completion of research work and students' motivation (Haksever and Manisali, 2000; Olmos-López and Sunderland, 2017). This could account for the efforts and programmes mapped out in various institutions to ensure that the supervisors keep abreast with supervision trends. Moreover, the quality of postgraduate research output is as good as the supervisor who guides the research process (Stewart, 2018). It is the basic duty of the supervisor to teach the student how to plan and conduct original research (Ngulube, 2005). The postgraduate research work may be supervised by only one mentor or co-supervised, depending on the institutional arrangements and availability of supervisors. Sole supervision is when a single supervisor is officially assigned to supervise a student from the beginning to the completion of the work.

The literature reviewed showed that sole supervision was the traditional practice in many countries and disciplines. For instance, doctoral

education in universities in Europe follows the tradition of individual supervision (Dysthe, Samara and Westrheim, 2006; Lahenius and Ikävalko, 2014). In Canada, sole supervision of doctoral students has been the norm, while co-supervision has been used mainly to assist academics who are starting out in developing their supervisory skills (Paul, Olson and Gul, 2014). Universities in Africa are not an exception to sole supervision. Individual supervision is still prevalent in doctoral education in South Africa, where the British model of supervision is still followed (Backhouse, 2010; Dietz, Jansen and Wadee, 2006; Ngulube and Ukwoma, 2019). In Nigeria, Aina (2015) notes that most (80%) of the library and information science (LIS) projects were supervised by a single supervisor.

Several studies have outlined the challenges encountered in supervision, such as low completion rates (Agu and Odimegwu, 2014; Aina, 2015; Dysthe, 2002). Although co-supervision may have some disadvantages such as the cost of paying the supervisors, the two supervisors arriving at a conclusion when there are divergent views, variation in practice (Chiappetta-Swanson and Watt, 2011), and unclear responsibilities and roles (Zou and Kong, 2019), co-supervision adds knowledge and expertise to the supervisory work (Paul, Olson and Gul, 2014). The complexity of supervision makes the practice of joint supervision or co-supervision necessary to ensure the production of quality doctoral education (Halse and Malfroy, 2010).

In fact, there has been a global trend away from sole supervision to co-supervision, especially for doctoral degrees (King, 2016; Ngulube and Ukwoma, 2019). The shift to co-supervision is necessary considering the increasingly interdisciplinary nature of doctoral programmes, continuing knowledge specialisation and institutional quality assurance requirements (Guerin and Green, 2015). Co-supervision is when two supervisors are assigned to mentor their supervisee until completion of the research task. It involves two or more academics who work collaboratively or jointly to support the strength and abilities of the supervisee (Coulton and Krimmer, 2005). They work together from the beginning to the completion of the work (Paul, Olson and Gul, 2014) in order to facilitate the student's progress (Olmos-López and Sunderland, 2017).

Some countries have changed from the traditional British model to co-supervision in order to generate new knowledge and skills and to encourage interdisciplinary research (Ngulube and Ukwoma, 2019). For instance, the University of Bergen in Norway shifted away from the reliance on only one supervisor to group supervision (Dysthe Samara and Westrheim, 2006). In 2009, the four-year doctoral programme at Stockholm University in Sweden moved away from individual supervision to collective supervision in the first year (Agné and Mörkenstam, 2018).

Moreover, the University of the Witwatersrand in South Africa conducted a study on the effective implementation of co-supervision in the Faculty of Health Sciences and made suggestions for the development of accountable co-supervisory practices (Grossman and Crowther, 2015). Even in professions such as fashion, Yujie et al (2019) states the benefits of co-supervision. That implies that many professions have come to appreciate the benefits of co-supervision. The question is: What are the supervision practices of LIS researchers, for instance, in Nigeria and South Africa?

Examining the situation in Nigeria and South Africa regarding supervision practices will contribute to understanding supervision trends in a specific context and subject discipline. Nigeria and South Africa have made significant contributions to the development of LIS programmes in sub-Saharan Africa (Aina, 1994; Ocholla, 2000; Ranasinghe, 2007). South Africa and Nigeria were chosen for this study because of their prominence in the development of the LIS profession and they were among the earliest countries with LIS programmes (Ocholla, 2000). For this study, a dissertation is defined as a research report submitted for the award of a master's degree in LIS; while a thesis is a research report submitted for the award of a doctorate in LIS.

Problem Statement

Supervision practices are fundamental to the completion of postgraduate studies. Although sole supervision seems to be dominant, as demonstrated by the literature reviewed in the previous sections, many institutions and countries advocate co-supervision (Coulton and Krimmer, 2005; Dysthe Samara and Westrheim, 2006; Guerin and Green,

2015; Olmos-López and Sunderland, 2017; Agné and Mörkenstam, 2018). However, little is known about supervision of LIS postgraduate research in South Africa and Nigeria. Studies by Backhouse (2010), Dietz, Jansen and Wadee (2006), and Grossman and Crowther (2015) on supervision in South Africa did not examine the theses and dissertations of postgraduate students as they used a different methodology to the one used in this study. However, studies on postgraduate supervision in Nigeria by Agu and Odimegwu (2014) looked at the evaluation of models in doctoral supervision. Agu and Oluwatayo (2013) and Aina (2015) also examined some factors contributing to the delay in theses completion. Aina (2017) investigated supervisors' perceptions of the LIS doctoral programme. Duze (2010) analysed some problems encountered by postgraduates at universities in Nigeria. Ngulube and Ukwoma (2019) investigated supervision patterns without throwing sufficient light on co-supervision practices; they used only PhD theses. To the best of the researchers' knowledge, no study has looked at the supervision practices in Nigeria and South Africa using master's and doctoral research outputs in LIS.

This article concerns the study on the supervision practices of LIS theses and dissertations at universities in Nigeria and South Africa that were accessible online at the time when the data were collected. The specific research questions were:

1 What are the supervision patterns in LIS theses and dissertations at the universities under study?

2 Which supervision models are prevalent in LIS theses and dissertations at the universities under study?

3 What are the academic qualifications of the postgraduate supervisors of LIS theses and dissertations at the universities under study?

4 Is there a difference in the subject coverage of the co-supervised and sole supervised LIS theses and dissertations at the universities under study?

Literature Review

Research-intensive universities have focused increasingly on enriching supervisory excellence as a tool to enhance research students' publication activity (Nultya, Kileyb and Meyers, 2008). Consequently, the trend is towards co-supervision than sole supervision. Frame and Allen (2002) noted that co-supervision gives students an opportunity to express their opinion and encourages teamwork and division of labour between the supervisors. In co-supervision there is more transparent and visible form of supervision (Olmos-López and Sunderland, 2017), it works best when it is student-centred (Li and Seale, 2007; Paul, Olson and Gul, 2014). It reduces the time to completion of theses and facilitates acculturation (Agné and Mörkenstam, 2018). It gives more contact with a wider professional network and richer discussion with a wider perspective (Zou and Kong, 2019).

Sometimes the nature of the research involved may be a determining factor for the form of supervision. Postgraduate supervision is not a single activity that is done in the same way every time. What works in one situation may work less successfully in another (Nultya, Kileyb and Meyers, 2008). In the natural sciences, co-supervision is more common than in the humanities (Backhouse, 2010; Grossman and Crowther, 2015). Pole (1998) interviewed 300 PhD students from six disciplines at 18 universities in the United Kingdom and confirmed that co-supervision was more common in the natural sciences and engineering sciences than in the arts and social sciences. Spoon-Lane et al (2007) confirmed that co-supervision was rare in the social sciences and sole supervision was common. This may be because of the kind of research and experiments conducted in the natural sciences and engineering. For instance, some experiments focus on the development of theories and models and designing machines/tools which require the contributions of experts in the different subject areas. Although it is confirmed in some literature, a lot depends on the policy of the institution. Cornér, Löfström and Pyhältö (2017) state that in Finland the policy for doctoral education in many universities stipulates at least two supervisors, with at least one supervisor having the minimum qualification of being an associate professor in the relevant field. This may not be the situation in other universities. Grant, Hackney and Edgar (2014) are of the opinion that supervision practices are not simply prescribed by institutional policies, but that research supervision is fluid and determined by

continuity and change. Therefore, in some cases, what is set out in institutional policy is not necessarily adhered to in practice nor is it even widely consulted by academic staff (Tinkler and Jackson, 2000).

Grossman and Crowther (2015) state that good co-supervision practices should first involve a novice. Moreover, those with a PhD must start by supervising master's students before attempting to supervise PhD students. Some universities in Australia require that novice supervisors be accredited as principal supervisor after they have co-supervised a doctoral student's work from beginning to completion (Robertson and Fyffe, 2019). In the case of Spoon-Lane et al (2007), the associate supervisors worked as co-supervisors with their senior colleagues; only in rare cases did they assume the position of principal supervisor. The novice supervisors learned from the expertise of the experienced supervisors. In some cases, two senior colleagues might co-supervise, based on their areas of specialisation, with each contributing their experience to produce a better product. Manderson et al (2017) describes supervisors' relationships with their fellows as two-way relationships. Frame and Allen (2002) describe positively the value of a co-supervision policy in ensuring access to at least one senior researcher who is knowledgeable in the research field. Phillips and Pugh (1987) concur that co-supervision provides better support in the case of interdisciplinary research. Cross institutional co-supervision provides a valuable opportunity for networking (Manderson et al, 2017).

Co-supervision may often be a learning process of how to supervise (Robertson, 2017), as the associate supervisor learns from the principal supervisor or vice versa. This is emphasised in the work of Spooner-Lane et al (2007), where the narratives of the associate supervisors highlighted the pros and cons of co-supervision. For instance:

> The reflection on another's practice leading to one's professional development does not solely have to stem from exposure to 'good' practice; even exposure to poor supervision provides an insight into ways one might not practice as a supervisor (Spooner-Lane et al, 2007: 53).

However, the impact on supervision support which students receive may be negative. Co-supervision practices appear to have become prevalent after changes in the educational system regarding supervision (Frame and Allen, 2002; Dysthe, 2002; Spoon-Lane et al, 2007; Guerin and Green, 2015; Olmos-López and Sunderland, 2017). Backhouse (2010) notes that doctoral education varies between universities, faculties, countries and even supervisors. In the learning of algorithms, Kumar and Krishna (2015) observe that a teacher-alone strategy does not work well for future generations and that co-supervision is necessary. Also, in fashion generation, Yujie *et al* (2019) propose a neutral co-supervision learning framework. Lahenius and Ikävalko (2014) suggest that owing to the complex nature of doctoral education, studies on co-supervision in different disciplines and countries would provide a better understanding of this topic. This study investigated supervision practices in the LIS discipline in South Africa and Nigeria. The findings of this study will contribute to existing literature on supervision practices and underscore the important role that supervision plays in the production of postgraduate student work.

The interdisciplinary nature of LIS (between library science and information science) has given rise to many subject areas. Sugimoto et al (2011) highlight some dominant themes in LIS as information seeking, use, access, organisation and retrieval; and the education and training of the professionals providing these services. Other subject areas covered in LIS theses as identified by Mutula and Majinje (2017) are artificial intelligence, library automation, institutional repositories, scholarly publishing and business intelligence. The diversity of subjects and the emerging fields in LIS put supervision practices in the spotlight considering that there might be varying degrees of expertise which may not reside in one academic.

Methodology

Qualitative content analysis of postgraduate theses and dissertations was adopted to generate the quantitative data used in this study. The qualitative methodology is subjective and it is rooted in the epistemology of interpretivism (Creswell and Creswell, 2018). Content analysis is a method of

analysing documents that may be used for qualitative and quantitative data (Elo and Kyngas, 2008). The choice of the qualitative approach was dictated by the nature of the data, which had to be categorised first before any analysis could be conducted. This study followed the line of previous studies on content analysis in measuring scholarly communication.

The study population consisted of master's and doctoral research output completed between 2009 and 2015 at universities in Nigeria and South Africa. Although, there are 25 accredited LIS schools in Nigeria (Librarian Registration Council of Nigeria, 2018), only the LIS schools with a footprint in institutional repositories (archives of theses and dissertations, articles and grey literature) were selected. *The Directory of Open Access Repositories* (DOAR, n.d.), which is an open access registry that captures institutional repositories in the world, was selected in line with previous studies. It is a quality-assured global directory of academic open access repositories that enables identification and browsing for repositories. However, it provides information to repositories that fully embrace the concept of open access to their content (Bashir, Mir and Sofi, 2019). It gives an up-to-date snapshot of the worldwide academic repositories landscape (Pinfield *et al,* 2014).

The University of Ibadan (UI), University of llorin, University of Nigeria, Federal University of Technology Minna, and Ahmadu Bello University Zaria (ABU) were potentially suitable for inclusion in the study, as they all deposited materials into DOAR. Nevertheless, the study was limited to the University of Nigeria Nsukka (UNN), UI and ABU. The University of Ilorin was excluded because it only uploaded research articles and not theses and dissertations, and the Federal University of Technology Minna was omitted because it only uploaded abstracts of undergraduate projects at the time of the study (March 2019). UI, the University of Nigeria and ABU were ranked first, second and third respectively in the production of postgraduate research outputs (Otubelu, 2010). Though UI ranked first in the production of postgraduate research output, few theses and dissertations were uploaded in their institutional repositories and the majority of the records in the repository were journal articles, as captured in DOAR at the time of this study. This affected the number of records used for this study. We do not claim that this is a representative study considering the number of theses and dissertations available online, but the few copies available showed similarity in the supervision pattern.

Although there are different opinions on the number of LIS schools in South Africa, the researchers worked with a sample of 10 LIS schools provided in recent studies (Maluleka and Onyancha, 2016; Ngulube and Ukwoma, 2019). The ten university repositories that were captured in the DOAR and formed the sample frame were Durban University of Technology (DUT), University of Cape Town (UCT), University of Fort Hare (UniF), University of Johannesburg (UJ), University of KwaZulu-Natal (UKZN), University of Limpopo (UL), University of Pretoria (UP), University of the Western Cape (UWC), University of South Africa (Unisa) and University of Zululand (UniZulu). It is noteworthy that the UWC did not deposit any theses and dissertations between 2009 and 2015, which meant that only nine universities were ultimately included in the sample for the study. This demonstrates that many sample frames have flaws, but that has not stopped researchers to conduct studies to establish the subjective and intersubjective essence of the phenomenon under investigation.

The researchers chose 2009 as the starting point because some of the repositories included in this study were launched in or before that period, for example Unisa in 2009, DUT in 2008, UP in 2006 and UniZulu in 2009 (DOAR, n.d.). The 2015 cut-off date for the analysis is within the range recommended for determining the changing patterns in scholarly communication (Stansbury, 2002).

The theses and dissertations were downloaded from the repositories of the universities being studied, and this took three weeks. The datasets were then cleaned and analysed manually, ensuring that the institution and completion date of the thesis or dissertation tallied with the scope of the study. The datasets that were downloaded but fell outside the scope of the study were discarded, leaving a total of 198 master's dissertations and PhD theses from South Africa and 202 from Nigeria, with a grand total of 400. Furthermore, they were arranged by year and subsequently by type of programme (master's or PhD) before extracting the required information on patterns of supervision. To ascertain if a work was co-supervised, the names of the supervisors had

to appear on the title page as supervisors of the work and then be acknowledged by the student on the acknowledgement page. The subject area of the master's or doctoral research output was extracted from the abstract and title pages of the work. The academic status of the supervisors was also extracted from the title page because the titles of the supervisors were available on that page. Thereafter, the coded data were entered on Excel (Microsoft® Excel ver. 10.0). To ensure reliability and validity, a sample of theses was coded by the second author but there were no significant variations. The results were presented using frequency, percentages and tables.

Findings

Table 1: Supervision patterns of LIS in Nigeria and South Africa

Country	Institution	Total number of theses and dissertations	Total number of dissertations (master's) f (%)	Total number of theses (PhD) f (%)	Number of sole-supervised theses and dissertations f (%)	Number of co-supervised theses and dissertations f (%)
Nigeria	Ahmadu Bello University, Zaria (ABU)	60	54 (19.0)	6 (5.2)	2 (0.7)	58 (47.2)
	University of Nigeria, Nsukka (UNN)	135	106 (37.3)	29 (25)	134(48.4)	1 (0.8)
	University of Ibadan (UI)	7	-	7 (6.0)	7 (2.5)	-
South Africa	Durban University of Technology (DUT)	5	3 (1.0)	2(1.7)	3 (1.1)	2(1.6)
	University of Fort Hare (UniF)	9	8(2.8)	1 (0.9)	9 (3.2)	-
	University of Limpopo (UL)	1	1(0.4)	-	1(0.4)	-
	University of Cape Town (UCT)	18	17(6.0)	1(0.9)	16(5.8)	2(1.6)
	University of Johannesburg (UJ)	18	13(4.6)	5(4.3)	15 (5.4)	3 (2.4)
	University of KwaZulu-Natal (UKZN)	45	21(7.4)	24 (20.7)	33 (11.9)	12(10)
	University of South Africa (Unisa)	31	14(4.9)	17 (14.6)	17 (6.1)	14 (11.3)
	University of Pretoria (UP)	51	38 (13.4)	13 (11.2)	35 (12.6)	16 (13.0)
	University of Zululand (UniZulu)	20	9 (3.2)	11 (9.5)	5 (1.8)	15 (12.1)
	Total	**400**	**284**	**116**	**277**	**123**

The supervision patterns of LIS theses and dissertations in Nigeria and South Africa, as shown in Table 1, revealed that they practised both sole supervision and co-supervision. Of the 400 theses and dissertations produced within the period, 69.3% was sole supervised and 30.7% was co-supervised. Furthermore, 143 of the theses and dissertations were sole supervised in Nigeria, and 134 were sole supervised in LIS schools in South Africa. While 59 theses and dissertations were co-supervised in Nigeria, 64 were co-supervised in South Africa. There is similarity in their supervision patterns.

Table 2: Supervision model that is Prevalent in LIS theses and dissertations

Country	Institution	Total number of co-supervised theses and dissertations	Number of co-supervised dissertations (master's)	Number of co-supervised theses (PhD)	Number of sole supervised theses and dissertations	Number of sole-supervised dissertations (master's)	Number of sole-supervised theses (PhD)
Nigeria	ABU	58	53 (59.6)	5 (14.7)	2	1(0.5)	1(1.2)
	UNN	1	1(1.1)	-	134	105(53.8)	29(35.4)
	UI	-	-		7	-	7(8.5)
South Africa	DUT	2	1 (1.1)	1(2.9)	3	2 (1.0)	1(1.2)
	UniF	-	-	-	9	8(4.1)	1(1.2)
	UL	-	-	-	1	1(0.5)	-
	UCT	2	2 (2.2)	-	16	15 (7.7)	1(1.2)
	UJ	3	1(1.1)	2(5.9)	15	12(6.2)	3(3.7)
	UKZN	12	4 (4.5)	8 (23.5)	33	17(8.7)	16(19.5)
	Unisa	14	9 (10.1)	5 (14.7)	17	5(2.6)	12(14.6)
	UP	16	12 (13.5)	4 (11.8)	35	26(13.3)	9(11)
	UniZulu	15	6 (6.7)	9 (26.5)	5	3(1.5)	2(2.4)
	Total	**123**	**89**	**34**	**277**	**195**	**82**

Table 2 indicates that sole supervision was most prevalent in the two counties, as shown by the number of theses and dissertations that were sole supervised in Nigeria (143) and South Africa (134). Of the 277 theses and dissertations that were sole supervised, 70.4% was master's dissertations and 29.6% was doctoral theses. Similarly, co-supervision was more prevalent for dissertations (72.4%) than for theses (27.6%). Furthermore, the breakdown of the supervision practice among the universities shows that sole supervision was more prevalent at UNN, UP and UKZN; while co-supervision was more prevalent at ABU, UP and UniZulu. In terms of sole-supervised dissertations, UNN (53.8%) recorded the highest percentage, followed by UP (13.3%); for theses, UNN (35.4%) also had the highest percentage, followed by UKZN (19.5%). In terms of the co-supervised dissertations, ABU had the highest percentage (59.6%), followed by UP (13.5%); UniZulu recorded the highest percentage (26.5%), followed by UKZN (23.5%), of co-supervised theses. In the universities where co-supervision was practiced, a professor co-supervised with another professor or with a doctorate holder. In a few instances, two master's degree holders co-supervised.

Table 3: Highest academic status of the supervisors

Country	Institution	Total number of supervisors	Professors	Doctorate degree holders	Master's degree holders
Nigeria	ABU	15	4	9	2
	UNN	14	4	10	-
	UI	5	3	2	-
South Africa	DUT	6	3	3	-
	UniF	2	1	1	-
	UL	1	-	-	1
	UCT	5	1	4	-
	UJ	9	5	4	-
	UKZN	12	5	3	4
	Unisa	16	10	2	4
	UP	21	10	7	4
	UniZulu	9	6	3	1
	Total	**115**	**52**	**48**	**15**

It is expected that for one to possess a doctorate degree, he/she must have obtained a master's degree. In this study, the researchers were concerned with the highest academic qualifications of the supervisors. Table 3 shows that only professors and doctorate degree holders were involved in supervision at UCT, DUT, UF, UJ, UniZulu, UI and UNN. At UKZN, Unisa, UP and ABU, there were three categories of supervisors, namely: professors, doctorate holders and master's degree holders. In the case of UL, where the supervisor was a master's degree holder, the question may arise of who served as that supervisor's mentor. From the data collected from UL, it was not easy to ascertain the number of supervisors in the department in order to determine if other supervisors at the level of professor or doctorate holder were available within the period in question.

Table 4: Sole-supervised theses and dissertations and their subject areas

	Major subject area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
Nigeria	Bibliometrics, scientometrics and informetrics		1					1	2
	Collection development-preservation		2	3	1		2	2	10
	E-governance/E-learning						1	1	2
	Information sources/studies		1	1	5	4	7	6	24
	Information and communication technology	3	2	2	6	2	2	4	21
	Records/Knowledge management					1		2	3
	Libraries	1			1	2			4
	Library education and curriculum					1		2	3
	Library management	2	2	3	7	1	1	2	18
	LIS profession/professional	2			1				3
	Scholarly communication		4	2		2	3	4	15
	User services		4	8	7	10	5	4	38
South Africa	Bibliometrics, scientometrics and informetrics	1	1			1	1	2	6
	Collection development-preservation/Technical services		1						1
	Competitive intelligence				1		1		2
	Design and innovations					2	1		3
	E-governance/E-learning			1				2	3
	Information and communication technology				1	1	4	5	11
	Scholarly communication	3		2		2	4	5	16
	Information sources/studies	1	2	1	3	9	1	3	20
	Knowledge/Records management	2	2	5	3	2	3	11	28
	Libraries			1			2	1	4
	Library education and curriculum							2	2
	Library management	2				1	3		6
	Quality assurance			1		1			2
	User services			2	5	6	5	10	28
	LIS profession and professionals		1					1	2

Table 4 shows the different major subject areas and the number of theses and dissertations produced in those subject areas within the study period. On the subject areas of the sole supervised theses and dissertations in Nigeria, a number of subject areas were supervised but the greater number was in user services, information sources and studies, library management, and information and communication technology. Subject areas like bibliometrics, scientometrics and informetrics, e-governance and e-learning recorded only two theses and dissertations each. In South Africa, most of the theses and dissertations covered user services, knowledge and records management, information sources/studies and scholarly communication. Subject areas like collection development-preservation/technical services had one thesis. While library education and curriculum, LIS profession and professionals, and competitive intelligence had two theses and dissertations each within the study period.

Table 5: Co-supervised theses and dissertations and their subject areas

	Major subject area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
Nigeria	Bibliometrics, scientometrics and informetrics							2	2
	Collection development-preservation			2					2
	Information sources/studies		2	3		1	7	6	19
	Information and communication technology			1	1		4	7	13
	Records/Knowledge management					1	1	1	3
	Libraries						1	2	3
	Library education and curriculum						1		1
	Library management	1		2			1	1	5
	Scholarly communication							1	1
	User services			2	2		1	5	10
South Africa	Bibliometrics, scientometrics and informetric			1	1			1	3
	Collection development-preservation/Technical services				2			1	3
	Competitive intelligence	1							1
	Design and innovations	1					2		3
	E-governance/E-learning	1		1	1	1	1	1	6
	Information and communication technology	1	1		2	3	1	2	10
	Scholarly communication				3				3
	Information sources/studies	2			1	3	2		8
	Knowledge/Records management	2	1	1	2	2			8
	Libraries						1	1	2
	Library management		1				1		2
	Quality assurance				1				1
	User services	2	1	3		3	5		14

The major subject areas of the co-supervised theses and dissertations, as presented in Table 5, were information sources/studies (both print and electronic) and information and communication technology. Otubelu (2010) also found that information resources were among the three core researched areas in LIS postgraduate research in Nigeria. In South Africa, the major subject areas of co-supervised theses and dissertations were user services and information and communication technology.

Discussion

The findings show that sole and co-supervision were practised in the supervision of theses and dissertations in the two countries. A limited number of theses and dissertations in Nigeria and South Africa were co-supervised. Sole supervision was prevalent in the two countries and in most of the universities, except in ABU, UP and UniZulu where co-supervision was more prevalent. This could be attributed to the fact that sole supervision was the traditional practice in many countries and disciplines (Dysthe, Samara and Westrheim, 2006; Lahenius and Ikävalko, 2014).

With the changing trends in research and the realisation of the benefits of co-supervision, as outlined by Coulton and Krimmer (2005), Paul, Olson and Gul (2014), Olmos-López and Sunderland (2017) and Robertson and Fyffe (2019) co-supervision is recommended. Considering the complexity of supervision and the quest to produce quality doctoral education (Halse and Malfroy, 2010), embracing co-supervision may be helpful as Frame and Allen (2002) claim that co-supervision helps to ensure that students have access to at least one supervisor at any given time. Some may argue that the number of supervisors at an institution determines the supervision practices; however, Cornér, Löfström and Pyhältö (2017) are of the opinion that two supervisors should be involved in doctoral education. In most cases, there seems to be a discrepancy between policy and practices (Grant et al, 2014; Tinkler and Jackson, 2000). However, it is not possible to draw this conclusion from the data, since even some of the institutions with fewer supervisors practiced co-supervision. For instance, UP had the highest number of supervisors, followed by Unisa, ABU and UNN; whereas UniF, DUT and UniZulu had the least number of postgraduate supervisors. Nevertheless, UniZulu produced the second-highest number of co-supervised dissertations and the highest number of co-supervised theses.

Although the findings show that the practice of co-supervision by two master's degree holders was evident, master's degree holders should always co-supervise with a more experienced supervisor. Spoon-Lane *et al* (2007) and Robertson and Fyffe (2019) note that novice supervisors should learn from experienced supervisors before they may be allowed to practice the tools of the trade on their own. Even a professor or a doctorate holder can be a novice in certain subject areas. Nevertheless, if a senior colleague co-supervises with a less experienced one, it will provide an opportunity for the latter to learn (Frame and Allen, 2002; Robertson, 2017). Supervisors are assigned based on their subject areas. Therefore, two professors can co-supervise, depending on the input expected from each of them to improve the quality of the research work.

Information sources/studies was the major subject area with the highest number of co-supervised theses and dissertations in Nigeria, while user services was the subject area with the highest number of co-supervised theses and dissertations in South Africa. For sole supervised theses and dissertations, user services and information sources/studies recorded the highest number in Nigeria; while user services and knowledge/records management recorded the highest number in South Africa. This shows that the subject areas of both sole and co-supervised theses and dissertations were similar. This implies that the subject areas of theses and dissertations may not be a factor in determining the form of supervision. Ordinarily, one would expect differences in subject areas of sole and co-supervised theses and dissertations, as the nature of the research could determine the form of supervision. Yeap and Kiran (2008) identify information use, need, seeking information networks and academic libraries as major subject areas covered by LIS theses at the University of Malaysia. Library management and administration, followed by user studies, were major subject areas covered by LIS postgraduate research at the University of Nigeria, with a few studies in subject areas like bibliometrics and special libraries (Echezona, Okafor and Ukwoma, 2011). However,

the fact remains that their research areas should be broadened, instead of concentrating on a few subject areas. In circumstances where there are insufficient supervisors knowledgeable in a subject area, interdisciplinary co-supervision may become necessary if it is the only option. Two supervisors can contribute based on their different areas of expertise. For instance, one may be a specialist in the subject area of the study (content) while the other may be a specialist in design (methodology); by co-supervising, they may help a student produce quality research work.

Implications for Postgraduate Supervision

This study has implications for supervisors and research students in the two countries. As the LIS departments in the two countries have contributed to the development of LIS programmes in Africa, knowledge of the research activities in the departments will be beneficial to the discipline. Considering the benefits of co-supervision over sole supervision, as highlighted by extant literature (Spooner-Lane *et al*, 2007; Manderson *et al*, 2017; Olmos-López and Sunderland, 2017; Robertson, 2017; Zou and Kong, 2019), encouraging institutions to adopt co-supervision will enhance their research output and the supervision experienced by students.

Furthermore, LIS research areas should be broadened; the current trend in research is interdisciplinary collaboration, especially in some of the subject areas that are not purely library based, and other new subject areas in LIS. It is important to encourage interdepartmental/interfaculty co-supervision. Collaboration enhances knowledge sharing and exchange of ideas, with each person benefiting from the wealth of experience of others. This can be partly achieved through co-supervision.

Limitations and Further Research

Based on the findings of this study, a further study interviewing supervisors to determine the factors influencing supervision patterns in various universities is recommended. This will help to identify the reasons for the low rate of co-supervision. The other limitation was the sample framework. Some of the research outputs from UI were not in the DOAR at the time of this study. Access to more records from that university may deliver more insights into the conclusions made in this study.

Conclusion

Having examined the sole-supervised versus co-supervised master's and doctoral research output of students from LIS departments of universities in Nigeria and South Africa, the results show that co-supervision was not practised much in some of the universities studied in the two countries. These universities produced more master's dissertations than doctoral theses, except in the case of UniZulu, UKZN and Unisa, where the opposite was true. The supervision culture of the universities studied seems to be similar, as co-supervision was practised at some of these institutions (although it was practised more at ABU, UP and UniZulu). The academic status of the supervisors showed that mainly professors and doctorate holders were involved in the supervision of students. The subject areas of the sole and co-supervised dissertations and theses were similar, which implies that the LIS researchers in the two countries should broaden their research subject areas to capture subject areas which can produce new designs and innovations in the discipline.

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