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Knowledge Production through Mentorship of Next Generation Scholars: Case Study of Universities in Kenya

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Abstract

This article is based on part of the findings of doctoral study that was completed at the University of KwaZulu Natal in 2015. The study investigated knowledge production in Kenyan universities. It addressed the following research questions among others: What is the level of scholarly productivity in universities in Kenya? What is the relationship between mentorship and scholarly productivity? What is the nature of ties between scholars in universities in Kenya? The study was underpinned by the Social Network Theory and applied the post-positivist paradigm. The quantitative and the qualitative approaches were used along with survey design. The population of the study consisted of academic staff and postgraduate students drawn from six purposively selected universities. Qualitative and quantitative data collected were analysed and presented using thematically on one hand and IBM SPSS Statistics and Gephi Social Network Analysis software on the other. The results revealed that a majority of young academic staff and postgraduate students in universities in Kenya were not actively involved in knowledge generation through research and publications, as only 42% of academic staff and 37% of postgraduate students produced 1-3 journal articles in the period 2010 to 2014. The study recommended institutionalisation of mentorship programmes to entrench scholarship amongst academic staff and graduate students, nurturing of scholarly collaboration to facilitate knowledge production.

Introduction

Strengthening African knowledge production through research in the universities rests largely with academic staff and postgraduate students, especially at the PhD level. Investment in R and D (Research and Development), enhancing mentorship programmes aimed at capacitating next generation of scholars, and collaborative scholarly engagement are vital (Mkandawire, 2009). Through mentorship, the postgraduate students and the young academics learn from the more senior academics, especially the professoriate for personal and professional development (Donaldson, Ensher and Grant-Vallone, 2000; Rose, Rukstalis and Schuckit, 2005).

Garvey and Alred (2003) assert that mentoring is increasingly employed in educational, social and occupational settings, and is associated with induction, career development, and career support and change. The mentor-mentee relationship makes significant contribution to professional, academic and personal development as the mentee integrates the prior and current experience of the mentor through supportive and challenging dialogue. Johnson (2006) opines that good mentorships promote socialisation, learning, career advancement, psychological adjustment and preparation for leadership. Compared to non-mentored individuals, those with mentors show more career satisfaction, are more committed to the organisation or profession and are more likely to mentor others in turn. Johnson (2006) points out that knowledge productivity in universities is correlated mentorship programmes targeting young and upcoming scholars. He observes that graduate students are better prepared to present papers at conferences, publish articles and book chapters, secure grant funding and generally demonstrate initiative and independence as scholars if they are mentored early in their careers. Worley (2011) assessed eight of the most productive researchers in

criminology and criminal justice to determine the characteristics shaping their success and found that almost all the respondents acknowledge that experienced scholars, who had mentored them while they were in graduate school, were instrumental in introducing them to rigorous research ethics, standards and practices that enabled them to be grounded in research publication. They also pointed out that collaborative research and scholarship greatly contributed to their overall exemplary scholarly productivity.

Coates (2012) affirms that organisations that foster mentoring programmes and partnerships among senior academics and postgraduate students foster greater networking and subsequently higher levels of productivity.

Levinson et al in Johnson (2002) observes that higher education, although officially committed to fostering of intellectual and personal development of students, provides mentoring that is generally limited in quantity and poor in quality. Levinson's study found that mentoring was rare when institutional constraints discourage supportive behaviour and when lecturers, as potential mentors, were rewarded primarily for other forms of productivity such as research, teaching and committee work (Johnson, 2006).

Theoretical Framework

The study was guided by the Social Network Theory which analyses the relationships and ties between individuals with emphasis on the structure of the relationships as opposed to the attributes of the participants in the relationships (Serrat, 2009; Otte and Rousseau, 2002). The Social Network Theory seeks to visualise, among other things, the channels through which information flows from one person to another and through which one individual could influence another (Scott, 2000). Social networks are nodes of individuals, groups, organisations, and related systems that tie in one or more types of interdependencies: these include shared values, visions, and ideas; social contacts; kinship; conflict; financial exchanges; trade; joint membership in organisations; and group participation. Social network analysis views social relationships, in terms of nodes and ties, as basic building blocks. Nodes are the individual actors within the networks, and ties are the relationships between the actors (Cahill, 2009). The nature of the ties between nodes in a social network is an important concept since it determines the extent of information sharing between nodes. Research has shown that strong ties are required for knowledge creation and sharing (McFadyen, Semadeni, and Cannella, 2009; Dyer and Nobeoka, 1998).

Mentoring networks among academics and between academics and students have been identified over the years as comprising dyads or triads in traditional or peer mentoring models. The traditional model basically involves a one-to-one, uni-directional relationship where a less experienced individual is paired with a more experienced person for guidance and support. Peer mentoring involves participants who are more or less equal in terms of age, experience, rank or position along hierarchical levels in an organisation. In such a setting, all participants have something of value to contribute and gain from each other (Angelique et al, 2002). More recently, however, mentoring has evolved to include newer models, research, approaches and experiences (Sorcinelli and Yun, 2012). Such developments include multi-mentoring networks where early career faculty are encouraged to build a network of support consisting of a variety of mentoring partners who each provide different aspects of mentoring (Sorcinelli and Yun, 2012; Packard, Walsh and Seidenberg, 2004). The modern mentoring relationship, has also benefitted greatly from the use of technology giving rise to e-mentoring where most of the mentoring relationship is conducted online using Internet-based tools such as video-conferencing, e-mail, virtual environments and groupware. E-mentoring supports the development of team-mentoring where several mentees are linked to one mentor or several mentors linked to one mentee, making it more practical and flexible (Faulin, Juan, Lera, Barrios and Forcada, 2012). Mentoring networks particularly those facilitated by technology, have also enabled collaborative research, writing and publication between geographically separated participants, as well as mentoring across and within various boundaries (Bristol, Adams and Guzman Johannessen, 2014).

Statement of the Problem

In the last decades, the proper training of new researchers has been gaining increasing interest, both

in academic and in industrial environments (Faulin et al., 2012). Mentorship has been shown to play a critical role in training new researchers to equip them with necessary knowledge and skills as the next generation of researchers and generally influencing their research productivity (Johnson, 2006; Worley, 2011). In terms of contribution to the global scholarly debate, Teferra (2004:159) asserts that Africa lies at the periphery of the knowledge market. Universities in Africa, and Kenya in particular, are ranked lower in global university ranking systems such as Webometrics compared to those in Europe and the Americas. These rankings are in part based on the universities' volume and quality of research output from both academics and postgraduate students (Cybermetrics Lab, 2015).

Few studies have been carried out to examine the levels of mentorship in universities in Kenya in relation to how this prepares emerging scholars to take up the mantle in research and publication. Sigué (2012) cites lack of sufficient mentorship and training of young faculty members/researchers and graduate students by senior academics as one of the contributing factors to low research productivity. This situation implies that emerging scholars and researchers in Africa generally, and Kenya in particular, are therefore not gaining sufficient research skills to enable them conduct and report on research through publications, leading to low research productivity that is then reflected in the low ranking of the institutions. As the British Academy for Humanities and Social Sciences (2015) acknowledges, research has tremendous potential to benefit the economy, our quality of life, as well as the effectiveness of public policy.

This study therefore sought to investigate the extent to which mentorship is used as a strategy to nurture emerging scholars in universities in Kenya.

Research Questions

The following research questions are addressed:

1. What is the level of scholarly productivity in universities in Kenya?
2. What is the relationship between mentorship and scholarly productivity?
3. What is the nature of ties between scholars in universities in Kenya?

Methodology

The population of the study consisted of academic staff and postgraduate students (PhD and Master's) of six universities in Kenya which were selected based on their relative performance in the 2013 Webometric ranking of universities. The top universities in Kenya were purposively selected. The Webometric ranking criteria are based on the volume and the quality of content an institution reflected through the web visibility. Within the six universities a sample of 350 academic staff and 370 postgraduate students were selected based on convenience sampling. This sampling technique was preferred because it was not possible to obtain and construct a sampling frame from the universities beforehand that would allow the use of probability sampling techniques. Convenience sampling allowed the researcher to include those participants who were readily available at the time of conducting the survey. This was especially because academic staff and postgraduate students were not always available in their offices or classrooms when the questionnaires were being distributed. This approach though introduced a number of biases. For example, it led to inclusion of more students and academic staff from the natural sciences, leaving out those from social sciences. This impacted on the generalisation of the results to the general population, although the results gave information that was relevant to the aim of the research (Saunders, Lewis and Thornhill, 2012). The characteristics of the individuals in the sample were generally comparable to those of the entire population in the universities in the study and universities in Kenya as a whole.

Separate self-administered survey questionnaires were designed for data collection from the postgraduate students and the academic staff. The data collected from respondents was mostly quantitative, and was analysed using SPSS that produced descriptive and inferential statistics. Qualitative data obtained from open-ended questions in the questionnaire were analysed thematically. Overall, of the 350 and 370 copies of the questionnaires administered to academic staff and postgraduate students of the six universities in Kenya, 273 (78%) and 332 (89.7%) respectively were returned and were found useful for analysis.

Results

The results of the research on the research questions outlined above are presented in this section.

Scholarly Output of Universities in Kenya

Although Boyer (1990) acknowledged that scholarship involves discovery (or research), integration (that is: interpretation or fitting one's own research into larger intellectual patterns), teaching and outreach, the productivity of scholars is now commonly measured in terms of the number of peer-reviewed articles and books written or edited, book chapters published, conference presentations made, and book reviews done (Freedenthal, Potter and Grinstein-Weiss, 2008).

Respondents were asked to rate the level of research in their departments in terms of quantity of output and their responses are shown in Table 1.

Table 1: Quantity of Research Output in the Departments (N = 590)

Level of research in department	Frequency	Percentage
Not sure	58	9.8
Low	156	26.4
Medium	242	41.0
High	134	22.7
Total	**590**	**100.0**

Compared to students, academic staff generally rated quantity of research output in their universities as being higher (Figure 1). This may be attributed to the fact that academic staff are usually more involved in research activities as compared to students, so in their view, much research was going on. Students, on the other, would be more preoccupied with completing their studies than conducting research.

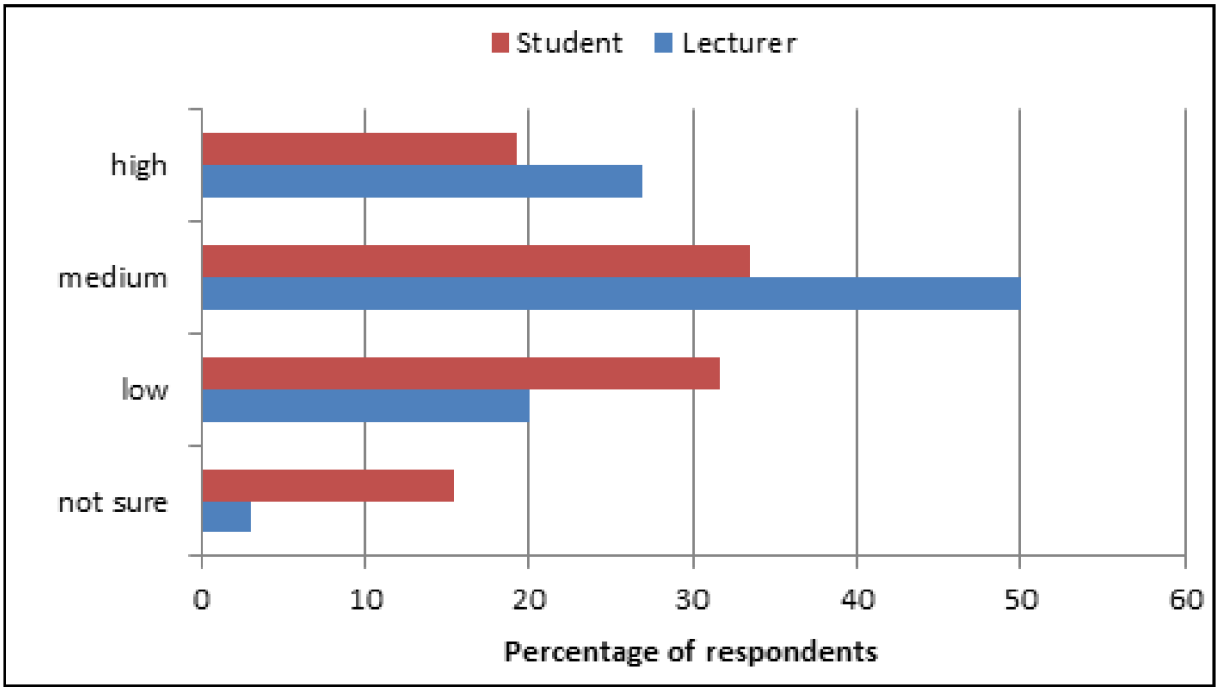

Figure 1: Respondents' Rating of Quantity of Research Output in the Universities

When asked to indicate the quantity of different scholarly output(s) respondents in the study had generated in the last five years (2010–2014) most of the academic staff (154, 70%), had produced between 1 and 3 theses (again assuming this was done either as authors or supervisors); conference presentations (121, 52%), and journal articles (91, 42%) in the last five years. However, the majority of them had not authored a book (92, 63%), book chapter (73, 46%), book review (77, 50%), technical reports (70, 52%), and working papers (71, 43%) in the same period (see results in Table 2).

Table 2: Frequencies of Academic Staff's Scholarly Output in the Last Five Years (2010—2014)

Type of scholarly output	Quantity of scholarly output in last five years									
	None		1 – 3		4 – 6		7 – 9		10 or <	
	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
Conference presentation	27	11.7	121	52.4	40	17.3	17	7.4	26	11.3
Journal article	51	23.5	91	41.9	44	20.3	16	7.4	15	6.9
Book	92	62.6	40	27.2	13	8.8	1	0.7	1	0.7
Book chapter	73	45.9	60	37.7	21	13.2	5	3.1	0	0.0
Book review	77	49.7	57	36.8	15	9.7	2	1.3	4	2.6
Abstract	51	32.5	48	30.6	35	22.3	6	3.8	17	10.8
Thesis	22	10.0	154	70.0	14	6.4	15	6.8	15	6.8
Technical report	70	51.9	34	25.2	12	8.9	7	5.2	12	8.9
Working paper	71	43.0	45	27.3	29	17.6	13	7.9	7	4.2

Key: Fq = frequency
Cronbach's Alpha: 0.81

With the exception of theses and conference presentations, most of the postgraduate students in the universities had not produced a book (166, 83%), book chapter (162, 81%), book review (141, 69%), technical reports (127, 58%), working paper (120, 57%) and journal article (130, 56%) in the last five years (Table 3). These findings are in line with the authors (Johnstone, 2007; Gabbidon, Higgins and Martin, 2011) who have found that researchers are expected to publish in peer-reviewed journals that are the most important for tenure and promotion, as opposed to other forms of publishing.

Table 3: Frequencies of Postgraduate Students' Scholarly Output in the Last Five Years

Type of scholarly output	Quantity of scholarly output in the last five years									
	None		1 – 3		4 – 6		7 – 9		10 or <	
	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
Conference presentation	114	45.6	113	45.2	20	8.0	1	0.4	2	0.8
Journal article	130	55.8	86	36.9	12	5.2	2	0.9	3	1.3
Book	166	83.4	20	10.1	11	5.5	0	0.0	2	1.0
Book chapter	162	81.4	22	11.1	14	7.0	1	0.5	0	0.0
Book review	141	68.8	50	24.4	13	6.3	1	0.5	0	0.0
Abstract	122	53.3	87	38.0	13	5.7	3	1.3	4	1.7
Thesis	100	40.3	128	51.6	15	6.0	2	0.8	3	1.2
Technical report	127	57.5	71	32.1	16	7.2	3	1.4	4	1.8
Working paper	120	56.9	71	33.6	16	7.6	1	0.5	3	1.4

Key: Fq=frequency
Cronbach's Alpha: 0.84

The Cronbach's Alpha values for this question were 0.81 and 0.84 for items in the academic staff and postgraduate students' questionnaires, respectively. This suggested a high internal validity of the test items.

Mentorship Programmes

Respondents were asked if they were mentoring (or were being mentored by) anybody academically at the time of the survey. The results are shown in table 4. A sizeable proportion of postgraduate students (150, 47%) was neither being mentored nor were mentoring others.

Table 4: Mentorship Programmes

Respondent type	Are mentoring or being mentored?	Frequency	Percentage
Academic staff	No	102	38.2
	Yes	165	61.8
	Total	**267**	**100.0**
Postgraduate students	No	150	46.6
	Yes	172	53.4
	Total	**322**	**100.0**

A Chi – square ($\div^2$) cross tabulation was computed to determine if mentoring or being mentored was dependent upon the respondents' university. There was a statistically significant influence of the respondents' university on productivity to mentoring or on being mentored, $\div^2 (5) = 27.45$, $p < 0.001$. Maseno University, Strathmore University and Egerton University were the strongest universities with regard to mentorship programmes (of the respondents, 46, 85%; 14, 70% and 38, 68% respectively said they were involved in mentoring someone or were being mentored (table 5). Kenyatta University and University of Nairobi appeared to be universities with the weakest mentorship culture (55, 51% and 136, 48% of the respondents respectively answered that mentorship was not happening).

Table 5: Cross tabulation of the Respondent's University and Mentoring

	Mentoring or being mentored		
Respondent's university	**No**	**Yes**	**Total**
University of Nairobi	136 (47.9%)	148 (52.1%)	284 (100%)
Maseno University	8 (14.8%)	46 (85.2%)	54 (100%)
Kenyatta University	55 (51.4%)	52 (48.6%)	107 (100%)
JKUAT*	29 (42.6%)	39 (57.4%)	68 (100%)
Strathmore University	6 (30%)	14 (70%)	20 (100%)
Egerton University	18 (32.1%)	38 (67.9%)	56 (100%)
Total	**252 (42.8%)**	**337 (57.2%)**	**589 (100%)**

* JKUAT – Jomo Kenyatta University of Agriculture and Technology

The respondents were asked to comment further on the mentoring culture in their institutions. Whereas there was near unanimity on the essential role of mentoring on building up future scholars, most respondents, especially the students, felt that the mentoring culture was poor. The study established that mentoring students was a requirement at Maseno University, which might explain the greater proportion of respondents from this university who said there was mentoring. However, most respondents at this university reported a lack of a structured mentoring programme in their departments. Most mentorship programmes extant in the universities were between the supervisor and his/her student (either Master's or PhD candidate).

Scholarly Interaction with Colleagues

The study required academic staff to describe the nature of their interaction with colleagues on scholarly matters that reflect some level of scholarly collaboration. The study found that most academic staff were willing to share knowledge with colleagues (91, 36% and 52, 21% rated the willingness as being often and always, respectively) and assist others in learning scientific issues (94, 37% and 42, 16% rated the willingness as being often and always, respectively) (table 6).

More respondents also stated that they often spent time on personal interactions with colleagues to discuss ideas, solutions, and scientific proposals (107, 41% and 15, 6% spend time on personal interactions often and always, respectively) and often held professional departmental meetings based on a pre-planned schedule (96, 37% and 17, 7% stated that the meetings occurred often and always, respectively). However, a substantial proportion of the academic staff stated that interdepartmental meetings based on a pre-planned schedule rarely occurred (71, 28%) or never occurred (22, 9%). Inter-item reliability as measured by the Cronbach's Alpha was relatively high at 0.81 for the items, which showed a high internal consistency.

Respondents were further requested to provide the names (or initials of the names) of members in their departments that they were collaborating with. Using this information and the Gephi Social Network Analysis software, a network of collaborations within departments was built (Figure 2). The results in figure 2 shows the different networks comprising each respondent and the other person(s) he/she is collaborating with in the department. Each of the six universities was represented in the network, which implied that at least one member who was surveyed in every university collaborated with at least one other member of the same department.

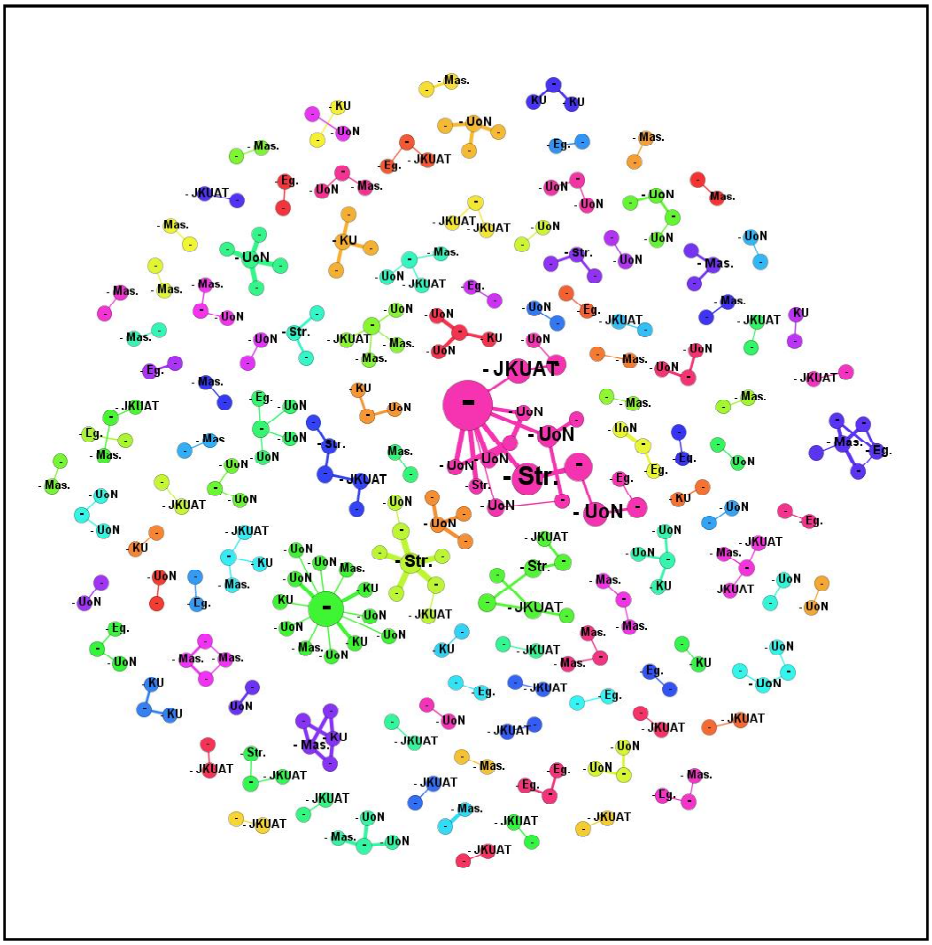

Figure 2: Network of Intradepartmental Collaborations in the Sampled Universities (N=272)

Key: JKUAT - Jomo Kenyatta University of Agriculture and Technology; KU –Kenyatta University; UoN – University of Nairobi; Mas – Maseno University; Eg – Egerton University; Str – Strathmore University

Table 6: Nature and Frequency of Scholarly Interaction amongst Academic Staff

Activity	Nature of interaction									
	Never		Rarely		Sometimes		Often		Always	
	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
How often you spend time on personal interactions?	4	1.5	38	14.7	95	36.7	107	41.3	15	5.8
How often you hold intradepartmental meetings?	9	3.4	39	14.9	101	38.5	96	36.6	17	6.5
How often you hold interdepartmental meetings?	22	8.7	71	28.1	89	35.2	54	21.3	17	6.7
More qualified colleagues willing to assist others	15	5.8	38	14.8	68	26.5	94	36.6	42	16.3
Willingness of colleagues to share knowledge	7	2.8	40	15.9	62	24.6	91	36.1	52	20.6

Key: M= moderately, Fq=frequency. (N=273 for academic staff; 332 for postgraduate students); Cronbach's Alpha: 0.81

The results in figure 2 show that the average degree of the network (that is, the number of connections each node has) was 1.297, which indicated that one member collaborated with just one other member in the department, forming dyads as the most common link between scholars in the universities. However, a few triads and tetrads are also evident from the mapping. Although the network depicted intradepartmental collaboration, there were instances in which one university was connected to another university, which indicated that some departmental members could be teaching or researching collaboratively with members in more than one university.

Relationship between Mentorship and Scholarly Productivity among Scholars in Universities in Kenya

Chi-square cross tabulations were used to compare the relationship between mentorship and research output. The results are presented in tables 7a-7g.

The cross-tabulation in table 7a revealed a weak relationship ($\div^2 = 15.589$, df=8, p = 0.049) between mentorship and publication of articles. It suggested that people with insufficient mentorship generally published more.

The cross tabulation in table 7b revealed no relationship between mentorship and book publication ($\div^2 = 3.59$, df=4, p = 0.464).

Table 7a: Cross tabulation between Mentorship and Publication of Journal Article

			Mentorship			Total
			None	Small	Large	
Journal article	none	Count	28	60	78	166
		% within journal article	16.9%	36.1%	47.0%	100.0%
	1-3	Count	37	62	60	159
		% within journal article	23.3%	39.0%	37.7%	100.0%
	4-6	Count	13	16	24	53
		% within journal article	24.5%	30.2%	45.3%	100.0%
	7-9	Count	6	3	6	15
		% within journal article	40.0%	20.0%	40.0%	100.0%
	10 or more	Count	4	9	1	14
		% within journal article	28.6%	64.3%	7.1%	100.0%
Total		Count	88	150	169	407
		% within journal article	21.6%	36.9%	41.5%	100.0%

Table 7b: Cross tabulation between Mentorship and Number of Books Published

			Mentorship			Total
			None	Small	Large	
Journal article	none	Count	28	60	78	166
		% within journal article	16.9%	36.1%	47.0%	100.0%
	1-3	Count	37	62	60	159
		% within journal article	23.3%	39.0%	37.7%	100.0%
	4-6	Count	13	16	24	53
		% within journal article	24.5%	30.2%	45.3%	100.0%
	7-9	Count	6	3	6	15
		% within journal article	40.0%	20.0%	40.0%	100.0%
	10 or more	Count	4	9	1	14
		% within journal article	28.6%	64.3%	7.1%	100.0%
Total		Count	88	150	169	407
		% within journal article	21.6%	36.9%	41.5%	100.0%

Table 7b: Cross tabulation between Mentorship and Number of Books Published

			Mentorship			Total
			None	Small	Large	
Book	none		50	76	105	231
			21.6%	32.9 %	45.5%	100.0 %
	1-3		12	25	20	57
		% within book	21.1%	43.9 %	35.1%	100.0 %
	4-6	Count	4	11	10	25
		% within book	16.0%		40.0%	100.0 %
Total		Count	66	112		313
		% within book	21.1%	35.8 %	Count	100.0 %
					% within book	
					Count	

Table 7c: Cross tabulation between Mentorship and Number of Book Chapters Published

			Mentorship			Total
			None	Small	Large	
Book chapter	none	Count	43	71	96	210
		% within book chapter	20.5%	33.8%	45.7%	100.0 %
	1-3	Count	25	27	24	76
		% within book chapter	32.9%	35.5%	31.6%	100.0 %
	4-6	Count	7	17	15	39
		% within book chapter	17.9%	43.6%	38.5%	100.0 %
Total		Count	75	115	135	325
		% within book chapter	23.1%	35.4%	41.5%	100.0 %

The cross tabulation revealed that there is no relationship between mentorship and book chapter publication ($\div^2 = 7.909$, df=4, p = 0.095).

Table 7d: Cross tabulation between Mentorship and Number of Book Reviews

			Mentorship			Total
			None	Small	Large	
Book review	none	Count	38	69	87	194
		% within book review	19.6 %	35.6%	44.8%	100.0 %
	1-3	Count	25	36	34	95
		% within book review	26.3 %	37.9%	35.8%	100.0 %
	4-6	Count	2	14	17	33
		% within book review	6.1%	42.4%	51.5%	100.0 %
Total		Count	65	119	138	322
		% within book review	20.2 %	37.0%	42.9%	100.0 %

The cross tabulation in table 7d showed that no relationship was found between mentorship and book review ($\div^2 = 7.319$, df=4, p = 0.120).

Table 7e: Cross tabulation between Mentorship and Abstract Publication

			Mentorship			Total
			None	Small	Large	
Abstract	none	Count	27	58	77	162
		% within abstract	16.7%	35.8%	47.5%	100.0%
	1-3	Count	28	49	43	120
		% within abstract	23.3%	40.8%	35.8%	100.0%
	4-6	Count	18	10	15	43
		% within abstract	41.9%	23.3%	34.9%	100.0%
	7-9	Count	7	13	8	28
		% within abstract	25.0%	46.4%	28.6%	100.0%
Total		Count	80	130	143	353
		% within abstract	22.7%	36.8%	40.5%	100.0%

The cross tabulation in table 7e showed that a weak relationship ($\div^2 = 17.015$, df=6, p = 0.009) existed between mentorship and abstract publication. It suggested that people with insufficient mentorship generally published more.

Table 7f: Cross tabulation between Mentorship and Publication of Technical Reports

			Mentorship			Total
			None	Small	Large	
Technical report	none	Count	29	70	86	185
		% within technical report	15.7%	37.8%	46.5%	100.0%
	1-3	Count	29	27	38	94
		% within technical report	30.9%	28.7%	40.4%	100.0%
	4-6	Count	4	10	10	24
		% within technical report	16.7%	41.7%	41.7%	100.0%
	7-9	Count	3	10	8	21
		% within technical report	14.3%	47.6%	38.1%	100.0%
Total		Count	65	117	142	324
		% within technical report	20.1%	36.1%	43.8%	100.0%

The cross tabulation in Table 7f showed that no relationship exists between mentorship and publication of technical reports ($\chi^2 = 10.994$, df=6, p = 0.089).

Table 7g: Cross tabulation between Mentorship and Publication of Working Papers

			Mentorship			Total
			None	Small	Large	
Working paper	none	Count	36	63	75	174
		% within working paper	20.7%	36.2%	43.1%	100.0%
	1-3	Count	17	37	53	107
		% within working paper	15.9%	34.6%	49.5%	100.0%
	4-6	Count	18	11	12	41
		% within working paper	43.9%	26.8%	29.3%	100.0%
	7-9	Count	2	9	8	19
		% within working paper	10.5%	47.4%	42.1%	100.0%
Total		Count	73	120	148	341
		% within working paper	21.4%	35.2%	43.4%	100.0%

The cross tabulation in Table 7g showed that a weak relationship ($\div^2 = 16.809$, df=6, p = 0.010) exists between mentorship and working paper publication. It suggested that people with between 4 and 6 working papers had no mentorship (44%) while those with between 7–9 working papers had either insufficient (47%) or sufficient mentorship (42%).

Barriers to Successful Mentorship

Respondents were asked to comment on the barriers to the success of mentorship programmes in their universities. The respondents indicated that the barriers to successful mentorship were lack of time as the mentors were too busy dealing with bloated workloads, too many students to be mentored, lack of mentors, bureaucratic rigidity, lack of resources, and shortage of materials. Others were poor attitudes of both the mentors and the mentees, laziness of mentors, poor communication because of lack of Internet, lack of facilities, poor motivation, and unwilling scholars. These findings concur with earlier studies (Myall, Levett-Jones and Lathlean, 2008; Nettleton and Bray, 2008) which found that effective mentorship was hindered by increased workload on the part of the mentors, having too many mentees, and inadequate institutional support for mentorship.

Discussion of Results

The results presented in the preceding section are discussed.

Scholarly Output of Universities in Kenya

A majority of postgraduate students had not authored any books (166, 83%), book chapters (162, 81%), book reviews (141, 69%), technical reports (127, 58%), working papers (120, 57%) or journal articles (130, 56%) in the period 2010–2014. This result seems to suggest that postgraduate students in the universities studied are hardly involved in producing scholarly work except theses. Belcher (2009) found that most graduate students do not write much because they lacked adequate writing skills and mentors to help them develop these skills. The results further indicated that a significant proportion (150, 47%) of postgraduate students were not involved in any mentorship programmes and cited barriers such as lack of time due to heavy teaching workload, few mentors, and unwillingness of the more established scholars to provide mentorship. This low level of participation of graduate students in the scholarly writing and publication activities seems to corroborate Garbati and Samuels (2013) who examined eighteen issues of six peer-reviewed journals in the field of education to determine the extent to which graduate students were participating in publication in these journals through co-authorship. Their study revealed that graduate students made up less than 9% of all authors published in these journals with the most common collaborative relationship involving a single graduate student and a professor. There were no instances of students publishing with other students. This study illustrated the low participation in collaborative research and writing that affects graduate students, and is similar to the situation facing Kenyan graduate students.

These results seem to indicate weak social ties between the students surveyed and their supervisors and between students themselves. This may imply that only formal course information is shared between these actors as opposed to information that would lead to creation of new knowledge. The results of this study seem to corroborate those of McFadyen et al. (2009) who conducted a bibliometric analysis of over 7,300 scientific publications by 177 research scientists working with more than 14,000 others over an 11-year period (1989–1999). Information about their publications was obtained from the Community of Science Database and verified through the Science Citation Index, PubMed, the National Library of Medicine search service and the Institute for Scientific Information's search services. The study showed that in a social network, strong ties are necessary for creation of knowledge. These ties are characterised by close and frequent interactions between a person and his/her exchange partners. This promotes the transfer of tacit knowledge which is crucial in mentorship, where the mentor provides an environment of growth characterised by visibility of the mentee, connection to other researchers within the academic environment, moral support, guidance of the mentee in self-reflection, vision-building and goal-setting (Sambunjak, Straus and Marusic, 2010; Jackson, Palepu, Szalacha, Caswell, Carr, and Inui, 2003).

Researchers who maintain mostly strong ties with research collaborators tend to have the highest levels of new knowledge creation (McFadyen et al, 2009). Similar observations were made by Dyer and Nobeoka (1998) who researched the Toyota case as an example of creating and managing a high performance knowledge-sharing network. The authors noted that sharing know-how (tacit knowledge) is difficult and therefore requires 'thick' or dense ties among members of a network. Furthermore, sharing tacit knowledge results in more sustainable advantages compared to information sharing and gives competitive advantage to networks that are able to transfer such knowledge. In the current study, the ties between the students and their supervisors in the universities surveyed seem not to promote sufficient transfer of tacit knowledge to enable generation of new knowledge.

Mentorship and Scholarly Productivity

The role of mentorship in cultivating successful scholars (whether graduate students or faculty) cannot be overemphasised. Several studies have shown that mentoring has an important influence on personal development, career guidance, career choice and research productivity of the mentees. Mentors provide emotional support and encouragement, and in the process, also benefit themselves through greater productivity, career satisfaction, and personal gratification (Sambunjak et al, 2010; Rose, et al., 2005). To succeed in academia, all faculties need super-ordinates in their networks and as mentors (Carr, Bickel and Inui, 2003; Jackson et al., 2003). This goes hand in hand with the Social Network Theory whose main postulate in an academic setting is the sharing of knowledge and passing on of skills from one node to another. The results of the current study seem to suggest that scientists and students in the universities surveyed had limited interdependencies tying them to each other, and this resulted in limited sharing of knowledge and skills between them. This was also supported by the findings of the Social Network Mapping (figure 2) which showed that majority of the ties amongst scholars in the universities comprised simple dyads and triads.

The results from this study also showed that only 91 (42%) of academic staff surveyed had written 1–3 journal articles in the last five years, with 51 (24%) of the rest producing no journal articles table 2). This is in spite of the expectation that they would be more productive, especially because it is a requirement for promotion and tenure (Gabbidon et al., 2011; Dennis, Valacich, Fuller and Schneider, 2006). The studies cited above (for example, Sambunjak et al, 2010; Rose et al., 2005) have shown that mentorship does influence research productivity. Therefore, it is possible that lack of effective mentoring programmes in the universities between junior and senior academic staff and between postgraduate students and academic staff is contributing generally to low research productivity. In this connection, it is worth noting that a majority of the respondents (398, 67%) rated the research output from their departments as low or medium, although academic staff generally rated research levels in their universities higher than the students did (refer to results in figure 1). This difference may be explained by the apparent dissociation of postgraduate students from the general research community of the universities surveyed. Since the results indicated that these students generally did not produce much scholarly content other than their theses, it may be assumed then that they were not active participants in research activity and were therefore not in a position to accurately judge what went on in research in their institutions.

The results in table 4 reveal that the majority of respondents 165 (62%) academic staff and 172 (53%) students were either mentoring others or being mentored, although a significant proportion of the respondents surveyed were not involved in mentorship, either as mentors or mentees. Moreover, respondents generally felt that mentorship in their universities was inadequate. The results revealed further that Maseno University, Strathmore University and Egerton University were the strongest in mentorship programmes (46, 85%; 14, 70%; and 38, 68%) respectively; followed by Jomo Kenyatta University of Agriculture and Technology (39, 57%); University of Nairobi (148, 52%); and Kenyatta University (52, 49%). It was established that mentoring of students was a requirement in Maseno University although students reported, that the mentorship programmes were not structured.

These results seem to strengthen the argument that was made earlier that a weak mentoring culture

in the universities in Kenya was impacting negatively on the productivity of scholars, resulting in low scholarly output. Studies have shown that mentoring is important in scholarly networks and directly influences professional development and productivity of scholars. Studies have also shown that institutions need to be formally involved in the mentoring relationships of their members for them to be beneficial. Myall et al (2008) conducted a study on the mentorship experiences of nursing students and practice mentors in the UK. The results of the study found the need to provide mentors with adequate preparation and support. Hutchings, Williamson and Humphreys (2005) examined the capacity issues required for supporting learners in clinical practice at an English acute sector hospital. The results showed that formalised institutional mentorship programmes were the most effective to enhance scholarship and vitality of faculty. From these results, it can be deduced that expertise and knowledge are not being shared effectively between researchers thus impacting on the levels of new knowledge creation in the universities. It also implies limited knowledge transfer between the more experienced researchers and their juniors' counterparts. Several authors have shown that knowledge creation is a function of the levels of knowledge sharing facilitated by conversations between individuals and teams (Botha, Kourie and Snyman, 2008; McFadyen et al, 2009; Travaille and Hendriks, 2010).

From cross tabulations of mentorship and scholarly productivity (tables 7a-7g), the study however revealed mixed findings on the relationship between mentorship and scholarly productivity. On the one hand, some of the results revealed no relationship between mentorship and productivity while on the other hand, some of the results showed that generally there was a weak relationship between mentorship and scholarly productivity of the respondents. Specifically, some of the results showed, for example, that contrary to expectations, mentorship did not produce the expected increase in production of the different types of scholarly output. For instance in table 7a, the cross tabulation between mentorship and publication of journal articles revealed that those respondents who were not adequately mentored seem to publish more than those who were mentored. Although this study did not probe the specific journals the scholars published in, this anomaly may be explained in terms of the types of journals that scholars in universities in Kenya publish in. It is possible that scholars in mentoring relationships endeavoured to publish in high ranking journals whose publication process generally takes longer and is more rigorous than the lower ranked journals. Authors have highlighted the difficulties associated with getting published in top-tier journals (Choi, 2002; Straub, 2009). Choi (2002) in particular notes that the average wait for an acceptance decision from these journals is 3 years. In contrast, scholars who lack mentorship may tend to publish more in the lower ranked journals whose turn-around time is less than the top ranking journals. In this way, these scholars may then have more output over a given period of time than those who are mentored. Other explanations for the results of the cross tabulation may be a mismatch between mentor–mentee (Gardiner, Tiggemann, Kearns and Marshall, 2007; Eby, Butts, Durley and Ragins, 2010; Eby and Lockwood, 2005), low performing mentees, expecting hand-outs from the mentors, as well as over dependence on mentors (Donald, 2007), who as the study revealed are senior academics who are extremely busy and may not provide the necessary level of mentorship geared towards increased scholarly productivity of both parties.

In table 7g, the cross tabulation revealed that respondents who were mentored produced more working papers than those who were not mentored. This concurs with authors such as Sambunjak et al. (2006) and Bristol et al. (2014) who showed that mentorship results in improved productivity. However, the results of this study are not conclusive on this aspect, and these need to be explored further in subsequent studies.

Respondents cited barriers to successful mentorship as lack of time due to heavy teaching workloads, large student numbers and few mentors, lack of resources, bureaucratic rigidity and unwilling scholars to provide mentorship. These results suggest that scholars and students at the universities in Kenya surveyed were facing similar challenges of mentorship to scholars in other parts of the world. For example, the results of this study corroborate studies that have shown that successful mentoring was hindered by lack of protected time for the mentoring programmes, challenges of balancing work demands and being a mentor, few mentors and lack of structured

mentorship programmes (Veeramah, 2011; Straus, Chatur and Taylor, 2009; Myall et al, 2008). The results of the study also corroborate Johnson (2002) and Aagaard and Hauer (2003) whose studies found that although nearly 95% of graduate students and medical students believed mentoring was essential for their personal and career development, only one third to one half reported having a mentor.

Nature of Ties between Scholars

The results revealed that (57%) of the respondents often or always shared knowledge among themselves, as well as assisting each other in learning scientific issues with 53% of respondents often or always willing to do so. Of the respondents, 44% often held professional departmental meetings. However, 37% of the respondents indicated that pre-planned interdepartmental meetings rarely or never occurred. The network analysis of collaborations within departments showed that most scholars participated in dyads and/or triads which indicate limited collaboration between scholars. A possible consequence of this is that there is limited knowledge sharing and transfer between individuals and the scholarly networks they participate in, as well as low levels of mentorship in such networks. De Janasz and Sullivan (2004) examined academic mentoring and proposed that changes and challenges in the current workplace have resulted in complexities that require individuals to rely on multiple, diverse individuals to provide needed mentorship to succeed in their careers.

Conclusions and Recommendations

The results showed that mentorship between senior academics with their junior counterparts including postgraduate students, was low. This was occasioned by weak mentoring structures within the institutions, heavy workload for both senior and junior scholars and negative attitudes towards mentorship by both senior and upcoming scholars. These factors limited opportunities for mentorship to enable the more established scholars to pass on tacit knowledge and skills to the less experienced scholars. This in turn impacted negatively on scholarly productivity of the researchers and their institutions.

The researcher therefore recommends that scholars in universities in Kenya should take a fresh look at the role and multiple benefits of mentorship to researchers' professional development and research productivity. For effectiveness in mentorship, it is recommended that the universities should set up formal structures that would create and nurture the mentorship relationships for both students and academic staff. This will entrench scholarship among academic staff and graduate students by facilitating transfer of relevant skills from the more experienced to the less experienced scholars, as well as develop relevant research, academic writing and publication skills within academia. Jackson et al (2003) proposed that mentoring should be recognised and formalised within institutions like any other academic activity. By so doing, the work of mentors would be encouraged, valued, rewarded and practised in a systematic way. Myall et al (2008) and Hutchings et al (2005) asserted that for mentorship to be successful it has to be institutionalised, and mentors should be given ample support by their institutions. Furthermore, as Carr et al. (2003) advise, mentees have the responsibility for self-examination to identify what skills and knowledge they lack so that they can proactively seek the combination of support and challenge from more experienced professionals that will foster their growth. Partnerships to nurture upcoming scholars in Kenya's universities ought to be built with efforts from both the senior and the upcoming scholars and researchers.

References

Aagaard, E. M. and Hauer, K. E. (2003). A Cross-Sectional Descriptive Study of Mentoring Relationships formed by Medical Students. *Journal of General Internal Medicine*, 18: 298-302.

Angelique, H., Kyle, K. and Taylor, E. (2002). Mentors and Muses: New Strategies for Academic Success. *Innovative Higher Education*, 26: 195-209.

Belcher, W. L. (2009). Reflections on Ten Years of Teaching Writing for Publication to Graduate Students and Junior Faculty. *Journal of*

Scholarly Publishing, 40: 184-199.

Botha, A., Kourie, D. and Snyman, R. (2008). Coping with Continuous Change in the Business Environment: Knowledge Management and Knowledge Management Technology, Oxford: Chandos Publishing.

Boyer, E. L. (1990). Scholarship Reconsidered: Priorities of the Professoriate, New York: The Carnegie Foundation for the Advancement of Teaching.

Bristol, L., Adams, A. E. and Guzman Johannessen, B. G. (2014). Academic Life-Support: The Self-Study of a Transnational Collaborative Mentoring Group. *Mentoring and Tutoring: Partnership in Learning*, 22: 396-414.

British Academy for the Humanities and Social Sciences. (2015). Section 3: What Research in the Humanities and Social Sciences Offers [Online]. Available: http://www.britac.ac.uk/policy/wilson/sec-3.cfm [Accessed 25 March 2015].

Cahill, M. (2009). Basics of Network Theory for Social Network Analysis (SNA)- Part 1 [Online]. Available: http://www.consultmark.ie/blog/2009/11/06/basics-of-network theory-for-social-network-analysis-sna-part-1/ [Accessed 03 October 2013].

Carr, P. L., Bickel, J. and Inui, T. S. (eds.) (2003). Taking Root in a Forest Clearing: A Resource Guide for Medical Faculty, Boston, Massachusetts: Boston University School of Medicine.

Choi, K. (2002). How to Publish in Top Journals [Online]. Available: https://www.google.co.za/url?sa=tandrct=jandq=andesrc=sand source=webandcd=3andcad=rj aanduac t= 8and ved=0CCwQFjACandurl= http% 3A%2F% 2Frfid.ctu. edu.tw% 2Frueychi %2Fdownload %2Fpublish.pdfandei=o 75lVd27LabfywPAg IOwDwandusg=AFQjCNH0FDPlev LY2NeI JETFr5mtrz8Cjw [Accessed 27 May 2015].

Coates, W. C. (2012). Being a Mentor: What's in it for me? *Academic Emergency Medicine*, 19: 92-97.

Cybermetrics Lab. (2015). Ranking Web of Universities: World [Online]. Available: http://www.webometrics.info/en/world [Accessed 25 March 2015].

De Janasz, S. C. and Sullivan, S. E. (2004). Multiple Mentoring in Academe: Developing the Professorial Network. *Journal of Vocational Behavior*, 64: 263-283.

Donald, F. (2007). Book Review: Mentoring and Coaching: Tools and Techniques for Implementation. *SA Journal of Industrial Psychology*, 33: 118-119.

Donaldson, S. I., Ensher, E. A. and Grant-Vallone, E. J. (2000). Longitudinal Examination of Mentoring Relationships on Organizational Commitment and Citizenship Behavior. *Journal of Career Development*, 26: 233-249.

Dyer, J. H. and Nobeoka, K. (1998). Creating and Managing a High Performance Knowledge-Sharing Network: The Toyota Case [Online]. Available: http://dspace.mit.edu/bitstream/handle/1721.1/1441/147b.pdf [Accessed 18 October 2013].

Eby, L. T., Butts, M. M., Durley, J. and Ragins, B. R. (2010). Are Bad Experiences Stronger than Good Ones in Mentoring Relationships? Evidence from the Protégé and Mentor Perspective. *Journal of Vocational Behavior*, 77: 81-92.

Eby, L. T. and Lockwood, A. (2005). Protégés' and Mentors' Reactions to Participating in Formal Mentoring Programmes: A Qualitative Investigation. *Journal of Vocational Behavior*, 67: 441-458.

Faulin, J., Juan, A. A., Lera, F., Barrios, B. B. and Forcada, A. (2012). E-Mentoring: Issues and Experiences in Starting E-Research Collaborations in Graduate Programmes. In: Juan, A. Daradoumis, T., Roca, M. and Grasman, S. E. (eds.) Collaborative and Distributed - Research. USA: Information Science Reference.

Freedenthal, S., Potter, C. and Grinstein-Weiss, M. (2008). Institutional Supports for Faculty Scholarship: A National Survey of Social Work

Programmes. *Social Work Research*, 32: 220-230.

Gabbidon, S. L., Higgins, G. E. and Martin, F. (2011). Moving through the Faculty Ranks: An Exploratory Study on the Perceived Importance of Book Publishing and Publishing in Peer-Reviewed Journals in Criminology/Criminal Justice. *Journal of Criminal Justice Education*, 22: 165-180.

Garbati, J. and Samuels, B. (2013). Publishing in Educational Research Journals: Are Graduate Students Participating? *Journal of Scholarly Publishing*, 44: 355-372.

Gardiner, M., Tiggemann, M., Kearns, H. and Marshall, K. (2007). Show me the Money! An Empirical Analysis of Mentoring Outcomes for Women in Academia. *Higher Education Research and Development*, 26, 425–442.

Garvey, B. and Alred, G. (2003). An Introduction to the Symposium on Mentoring: Issues and Prospects. *British Journal of Guidance and Counselling*, 31, 3.

Hutchings, A., Williamson, G. R. and Humphreys, A. (2005). Supporting Learners in Clinical Practice: Capacity Issues. *Journal of Clinical Nursing*, 14: 945-955.

Jackson, V. A., Palepu, A., Szalacha, L., Caswell, C., Carr, P. L. and Inui, T. (2003). "Having the Right Chemistry": A Qualitative Study of Mentoring in Academic Medicine. *Academic Medicine*, 78: 328-334.

Johnson, W. B. (2002). The Intentional Mentor: Strategies and Guidelines for the Practice of Mentoring. *Professional Psychology: Research and Practice*, 33, 88.

Johnson, W. B. (2006). On Being a Mentor: A Guide for Higher Education Faculty, Mahwah, NJ, Lawrence Erlbaum.

Johnstone, M. J. (2007). Journal Impact Factors: Implications for the Nursing Profession. *International Nursing Review*, 54: 35-40.

Mcfadyen, M. A., Semadeni, M. and Cannella, A. A. (2009). Value of Strong Ties to Disconnected Others: Examining Knowledge Creation in Biomedicine. *Organization Science*, 20: 552-564.

Mkandawire, T. (2009). Foreword. In: The British Academy and Association of Commonwealth Universities (Eds.) The Nairobi Report: Frameworks for Africa-UK Research Collaboration in the Social Sciences and Humanities. London: The British Academy.

Myall, M., Levett Jones, T. and Lathlean, J. (2008). Mentorship in Contemporary Practice: The Experiences of Nursing Students and Practice Mentors. *Journal of Clinical Nursing*, 17: 1834-1842.

Nettleton, P. and Bray, L. (2008). Current Mentorship Schemes Might be Doing Our Students A Disservice. *Nurse Education in Practice*, 8: 205-212.

Otte, E. and Rousseau, R. (2002). Social Network Analysis: A Powerful Strategy, also for the Information Sciences. *Journal Of Information Science*, 28: 441-453.

Packard, B. W. L., Walsh, L. and Seidenberg, S. (2004). Will that be One Mentor or Two? A Cross Sectional Study of Women's Mentoring During College. *Mentoring and Tutoring: Partnership in Learning*, 12: 71-85.

Rose, G. L., Rukstalis, M. R. and Schuckit, M. A. (2005). Informal Mentoring between Faculty and Medical Students. *Academic Medicine*, 80: 344-348.

Sambunjak, D., Straus, S. E. and Marusic, A. (2006). Mentoring in Academic Medicine: A Systematic Review. *JAMA*, 296: 1103-1115

Sambunjak, D., Straus, S. E. and Marusic, A. (2010). A Systematic Review of Qualitative Research on the Meaning and Characteristics of Mentoring in Academic Medicine. *Journal of General Internal Medicine*, 25: 72-78.

Saunders, M., Lewis, P. and Thornhill, A. (2012). Research Methods for Business Students, England, Pearson Education Limited.

Scott, J. (2000). Social Network Analysis: A Handbook, London, Sage Publications Ltd.

Serrat, O. (2009). Social Network Analysis [Online]. Available: Http://Www.Cin.Ufpe.Br/~Idal/

SN%20-%20PDF/Social-Network-Analysis.Pdf [Accessed 03 October 2013].

Sigué, S. P. (2012). The Challenges of Research in African Business Schools. *Journal of African Business*, 13: 83-86.

Sorcinelli, M. D. and Yun, J. (2012). Mutual Mentoring Guide. Umass Amherst Office of Faculty Development. [Online]. Available: http://Www.Umass.Edu/Ctfd/Mentoring/Downloads/Mutual%20Mentoring%20Guide%20Final%2011_20.Pdf [Accessed 23 March 2015].

Straub, D. W. (2009). Editor's Comments: Why Top Journals Accept Your Paper. *MIS Quarterly*, 33, Iii-X.

Straus, S. E., Chatur, F. and Taylor, M. (2009). Issues in the Mentor-Mentee Relationship in Academic Medicine: A Qualitative Study. *Academic Medicine*, 84: 135-139.

Teferra, D. (2004). Striving at the Periphery, Craving for the Centre: The Realm of African Scholarly Communication in the Digital Age. *Journal of Scholarly Publishing* 35: 159-171.

The British Academy and the Association of Commonwealth Universities. (2009). The Nairobi Report: Frameworks for Africa-UK Research Collaboration in the Social Sciences and Humanities [Online]. Available: https://Www.Acu.Ac.Uk/Focus-Areas/Early-Careers/Nairobi-Report [Accessed 23 April 2013].

Travaille, A. M. and Hendriks, P. H. J. (2010). What Keeps Science Spiralling? Unravelling the Critical Success Factors of Knowledge Creation in University Research. *Higher Education*, 59: 423-439.

Ubogu, F. N. (2001). Spreading The ETD Gospel: A Southern Africa Perspective. *International Information and Library Review*, 33: 249-259.

Veeramah, V. (2011). What are the Barriers to Good Mentoring? *Nursing Times*, 108: 12-15.

Worldmapper. (2006). Science Research [Online]. Available: http://Www.Worldmapper.Org/Display.Php?Selected=205 [Accessed 19 February 2013].

Worley, R. M. (2010). What Makes them Tick: Lessons on High Productivity from Leading Twenty First Century Academic Stars. *Journal of Criminal Justice Education*, 22: 130-149.

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