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Research by academic librarians at public universities in Ghana: emerging patterns from a survey and a bibliometric study

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This study explores how the academic environment facilitates the ability of academic librarians at public universities in Ghana to fulfil their research and publication mandate. A web survey of academic librarians was conducted to explore the opportunities and resources for research. Based on a bibliometric analysis of journal articles, the study also investigated the nature of research production of academic librarians in Ghana, specifically their co-authorship patterns, publication outlets and research visibility. The results show that academic librarians mainly produce single-authored articles and articles that are co-authored within their home institution, with a preference for publishing in local journals. Their research visibility, operationalised as time-based citation scores derived from data in Google Scholar, is also limited in light of a lack of international co-authorship. Opportunities and resources for project participation, funding, conference participation and publishing are all mostly linked to having completed a research qualification. The results further suggest that, for some librarians, it seems indeed possible to engage in research despite the odds.

Keywords: Academic librarians, collaboration, Ghana, Google Scholar, research

1 Introduction

By university decree in Ghana, all professional librarians at public universities who hold a master's degree in information science or librarianship are accorded academic status and referred to as academic librarians (Lamptey & Agyen-Gyasi 2010). Key arguments supporting this development at the University of Ghana, for instance, were that the university library is an academic centre and that its professional staff had always been contributing to the academic pursuits of the university (Opoku 2012). Whatever the reasons, academic librarians in Ghana are subject to the same criteria for promotion as academic staff in university departments and research centres. In order to move up the ranks, academic librarians must do research and publish their findings. For example, at the University of Ghana, an assistant librarian requires at least three publications (either national or international) in order to be promoted to the rank of senior librarian (Opoku 2012).

Academic librarians in Ghana are thus constantly under pressure to either publish or perish, while their daily routines remain dominated by library duties. In fact, for academic librarians to fulfil their research and publication mandate, two kinds of activities are required: conducting research and publishing research. The one activity reinforces the other because "if the work context is populated by academics with poor publication experiences, that would result in lower research standards" for conducting research (Carli, Tagliaventi & Cutolo 2019: 1925). Both activities are highly dependent on a set of enabling conditions, resources and opportunities, as well as on research time and research funding. In sub-Saharan Africa, favourable conditions, resources and opportunities for research already seem to be inadequate for many emerging academics and researchers (Beaudry, Mouton & Prozesky 2018). Not surprising, then, academic librarians are struggling to meet their research and publication mandate. Some academic librarians in Ghana are of the opinion that, although their academic status is justified, they cannot be treated the same as other academics in terms of research expectations (Opoku 2012).

In view of the foregoing evidence, this study explores how the academic environment facilitates the ability of academic librarians at public universities in Ghana to fulfil their research and publication mandate, with a focus on emerging patterns. Specifically, the study explores the opportunities and resources for research, based on a web survey of academic librarians

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in Ghana. Drawing upon a bibliometric analysis of journal articles, the study also highlights the nature of research production of academic librarians in Ghana, specifically their co-authorship patterns and publication outlets and how these relate to research visibility. Six research questions guided the survey and bibliometric analysis:

- What percentage of their working time do academic librarians spend on research *vis-à-vis* other professional activities?
- In what research activities do academic librarians participate that could cast light on opportunities and resources for research?
- What are academic librarians' perceived barriers to and motivations for research?
- What is the general pattern of research co-authorship of academic librarians?
- What are the journal publication outlets of academic librarians?
- How do both research co-authorship and publication outlet relate to the visibility of research produced by academic librarians?

Before addressing these questions and explaining the research methods used, a brief review of relevant literature is provided. The review focuses on selected aspects of research production in the context of academic librarianship.

2. Research production and academic librarians

Obviously, reasons for research and publication are not the same for every academic but vary according to career stage (Hangel & Schmidt-Pfister 2017) and can reflect both intrinsic and extrinsic motivations (Hollister 2016). Intrinsic motivations are underpinned by personal traits such as intellectual curiosity and personal satisfaction, whereas organisational and institutional factors (for example, work allocation, funding and incentives) are typical examples of extrinsic motivations (Snowball & Shackleton 2018). One such extrinsic motivation, the desire to earn promotion, emerged as the most important reason for engaging in research and publication in a survey of librarians at universities in South-East Nigeria (Ibegbulam & Jacintha 2016). Moreover, not only do the reasons for doing research by academic librarians differ, but so does the importance attached to research. For instance, research was not considered a primary role by more than half of the 193 academic librarians and library administrators in the New England region of the United States of America (USA), according to a survey by Freedman (2014). The three key responsibilities in Freedman's survey were reference (65%), instruction and teaching (62%), and collection development (60%).

What is meant by research in the case of academic librarians also seems to be open for interpretation. Kandiuk and Sonne de Torrens (2018) conducted an analysis of agreements and policies that govern the working conditions and terms of employment for academic librarians in Canada. Of the documents that included research and scholarship as a requirement, the definitions of research and scholarship varied. For instance, some documents restricted research to apply only to the librarians' professional practice and/or the field of library and information science (LIS). From interviews conducted with librarians at Pennsylvania State University in the USA, Fennewald (2008) could identify three groups of academic librarians in terms of research orientation. Some academic librarians viewed their research as practice based and closely linked to their daily operations. Others saw their research as institutional based, which means addressing a particular agenda of their institution or representing their institution in a research consortium. A third group's research was discipline based. They were the ones confining themselves to a subject area that stemmed from their postgraduate research interests or which represented a niche area that they had crafted for themselves. On the other hand, for Goulding and Matthews (2002), the library and information profession is essentially vocational, which means that research is mostly applied and addresses complex service delivery issues. Perkins and Slowik (2013), who conducted interviews with the library administrators of academic libraries at universities in the USA, report the benefits of research by librarians as:

> fulfilling tenure-track requirements, enriching relationship with teaching faculty, library faculty recognition, improved services and programs, collaboration with others, research result application to daily issues, development as librarians, and improved knowledge of the research field (Perkins & Slowik 2013: 153).

Moreover, the term 'academic librarian' implies both an academic and a professional work component. The academic component is often foregrounded, although the pressures (for research and publication) associated with that aspect do present a challenge. The professional component can thus be exploited to satisfy academic pressures to conduct research and to publish findings. For instance, Janke and Rush (2014) believe that librarians could be an asset to research teams by demonstrating their professional expertise. Examples from a real-life case include applying literature refinement strategies and conducting literature reviews in a team setting, as well as sourcing relevant literature to support the team's research findings and to strengthen arguments in the manuscripts under preparation. These tasks require deep engagement

with the research itself, thereby allowing librarians to "see their added value, or more strongly, the central role they could play on research teams" (Janke & Rush 2014: 119). Thus, by emphasising their professional expertise, academic librarians could expand their traditional service delivery to become co-investigators in research projects. In turn, this could provide them with the necessary publication output to fulfil their academic mandate.

In instances where academic librarians do publish research, certain characteristics of publishing are evident. A study by Wood and Park (2013) on the publication activities of academic librarians in Tennessee in the USA, found *Tennessee Libraries*, a peer-review professional journal of the Tennessee Library Association, to be the most popular publication outlet. Of the articles analysed, 34% appeared in that journal. On the African continent, Ocholla, Ocholla and Onyancha (2012) performed an analysis of publications by library staff from public and private universities in ten East African countries. Their analysis revealed an orientation towards single-authored publications in national and regional journals (as opposed to co-authored publications in international journals). In fact, 45% of publications by library staff from East Africa appeared in the *University of Dar es Salaam Library Journal* (published in Tanzania) and 63% of publications were single-authored. Furthermore, only 28% of librarians in senior management had publications in the Library and Information Science Abstracts (LISA) database, which means that the publications of librarians in East Africa do not appear in visible outlets. In a similar study by the same authors (Ocholla, Ocholla & Onyancha 2013), 57% of the articles by librarians in university libraries were single-authored.

Co-authored articles, although seemingly uncommon among academic librarians, could be of value to them for different reasons. Collaboration is constantly encouraged and valued in university policies, which means that academic librarians could show their alignment with their university's mission by collaborating in research with others – both within and outside the field of LIS (Borrego, Ardanuy & Urbano 2018). In the study of Ibegbulam and Jacintha (2016), which surveyed productive librarians at universities in South-East Nigeria, collaboration with colleagues was the most important reason for the librarians' relative success in research and publication. Articles involving international collaboration attracted the highest number of citations in a recent bibliometric study of LIS research in Africa (Asubiaro 2019). Of the 1,827 LIS research outputs in Asubiaro's study, 36% had never been cited. Of those cited, the average citation per year was 0.67. The same study also reported limited regional collaboration in LIS research: more than 70% of publications listed only one African institution in the author address and more than 90% listed only one African country.

All things considered, many academic librarians in Africa are aware that research and publications are part of their conditions of service. It is required of them to collaborate in research and to publish in national and international journals, in order to increase their university's research visibility. However, to what extent do these requirements reflect reality at the Ghanaian public universities and are there enough resources and opportunities to meet the requirements?

3. Data and methodology

The web survey and bibliometric study, discussed in this section, provide some answers to the above questions.

3.1 Web survey

A web survey was conducted of academic librarians at the ten Ghanaian public universities. Information available at the time of the study revealed that these universities had eighty-two librarians. A questionnaire was developed which collected information about the background of the librarians, their research activities in the previous five years, and the perceived barriers to and motivations for doing research. A cover letter assured the librarians that completion was voluntary, that there were no known or anticipated risks and that they could decline to answer any of the questions without any consequences. The librarians were sent three email reminders. Telephone calls were also made to the librarians at the Kwame Nkrumah University of Science and Technology (KNUST) after sending the email reminders, as KNUST is the home institution of one of the authors.

Of the population of eighty-two academic librarians, thirty-seven eventually completed and submitted questionnaires; a response rate of 45%. As it turned out, all of those that responded had specified a master's degree as their highest qualification, with the exception of one respondent who had a diploma in Librarianship. It was decided to exclude the latter respondent in the analysis in order to create a homogenous group of respondents, thus resulting in a dataset of thirty-six respondents. The respondents with master's degrees were from seven universities, with four universities accounting for 86% of responses: KNUST (31%), University of Cape Coast (19%), University for Development Studies (19%), and University of Ghana (17%).

3.2 Bibliometric study

The names of the academic librarians at the ten public universities in Ghana were sourced from the university websites and from informants known to the first author. Details of publications produced by the librarians were obtained by using the names of the librarians as search criteria in Google Scholar. Scopus and the Web of Science (WoS) were used to source

additional publications. A few librarians were also asked for their curricula vitae (CVs); specifically, those who had not set up a Google Scholar profile and whose publications could not be found in either Scopus or WoS. Only journal articles, once verified, were selected for bibliometric analysis as these were the most complete of all the publication output gathered. The analysis was conducted in Microsoft Access, involving a final set of eighty-seven articles published by academic librarians in the period 2005 to 2015.

In order to investigate the nature of research production, classifications of both co-authorship and journal outlets were created. For the authorship classification, each article was assigned to one of four mutually exclusive categories, based on the details of the author addresses: (1) no co-authorship, (2) national co-authorship within own university, (3) national co-authorship with other institutions in country, and (4) international co-authorship.

For the classification of journals, it was first established whether a journal is indexed in either Scopus or WoS. These two reputable databases select journals for indexing based on criteria that mainly correspond to the quality/depth principle in the case of WoS, and the quantity/breadth principle in the case of Scopus (Ball & Tunger 2006). The ProQuest list of journals in the LISA database (LISA 2019) was also consulted in order to identify journals that are actively indexed in LISA, pointing to publications in the field of LIS and closely related fields. Questionable journals were also identified from Beall's list of predatory journals and journal publishers (Beall's list 2019). The final classification of journals, taking into account the overlap in indexing, comprised seven categories: Scopus, WoS and LISA; Scopus and WoS; Scopus and LISA; Scopus only; LISA only; Beall's list; and Other. The 'other' category contained journals not in Scopus, WoS, LISA or Beall's list (for example, the *UDS International Journal of Development*, published by the University for Development Studies (UDS) in Ghana). The names of journal publishers were obtained through internet searches.

Citation counts, especial those covering relatively short periods of time, are related to the visibility of research (Moed et al. 1985). In order to analyse such research visibility, Google Scholar was again used to obtain the total number of citations for each article up to the end of 2018. Theoretically, each article was given at least three years in which to be cited – the publication period ended in 2015 and the citation period ended in 2018. However, a bias would have been introduced if raw counts were used to reflect the number of citations per article. 'Older' articles have a theoretically greater chance to be cited than 'younger' articles. To compensate for this potential bias, a time-based citation score (as opposed to a raw score) was computed. For every article, the number of citations in Google Scholar was divided by the number of full years since publication of that article, similar to the procedure used by Prozesky and Boshoff (2012). For instance, if an article was published in 2007 and received three Google Scholar citations by the end of 2018, the resulting time-based citation score was 0.27 (the three citations divided by the 11 years that had passed since the start of 2008 and up to the end of 2018). Thus, by calculating the mean number of citations over a set period, the study corrected for the fact that articles were published in different years, which could influence the citation score. The study did not control for self-citations.

4. Results

This section presents the results of the web survey (with a focus on opportunities and resources) and the bibliometric study (with a focus on research production and research visibility).

4.1 Opportunities and resources

Time is arguably one of the most important resources required by academic librarians to conduct research. Table 1 reports the percentage of working time that the academic librarians spent on each of five activities: administration and management, research, voluntary services, undergraduate and postgraduate teaching, and the training/supervision of postgraduate students. Research appears to be in a more favourable position (in terms of time allocation) compared to both undergraduate and postgraduate teaching and postgraduate supervision. On average, the respondents spent 26% of their time on research compared to 13% and 11% of their time spent on teaching and postgraduate supervision respectively. The position of research, relative to these two activities, is equally favourable when the medians are computed: 20% versus 10%. However, the activity of administration and management remains the single largest burden on academic librarians as 47% of their working time, on average, is devoted to it. Academic librarians also seem to spend a reasonable portion of their working time (18%) on voluntary services within or outside the university (for example, editorial duties).

The librarians were asked to indicate their research activities of the previous five years. A list of fifteen activities was presented. For each activity, they had to indicate whether that activity applied to them. Ten of the thirty-six participants left the entire question unanswered, which might suggest that the listed activities did not apply to them. Figure 1 is therefore based on an adjusted total of 26 respondents and shows the percentage of librarians who responded to each activity in the affirmative. The activities are grouped into five sets: research projects, research training, research funding, research conferences, and research publishing. The extent of involvement in these activities provides an indication of the availability of opportunities and resources for research in the case of academic librarians.

Table 1 Percentage working time that librarians spent on five activities (N=36)

Activities	% Working time spent on activities				
	Mean	Median	Std. Dev.	Lowest	Highest
Administration and management	47%	45%	27.3	0%	100%
Research	26%	20%	16.8	0%	70%
Voluntary services	18%	10%	17.6	0%	80%
Undergraduate and postgraduate teaching	13%	10%	13.7	0%	50%
Training/supervising postgraduate students	11%	10%	14.3	0%	60%

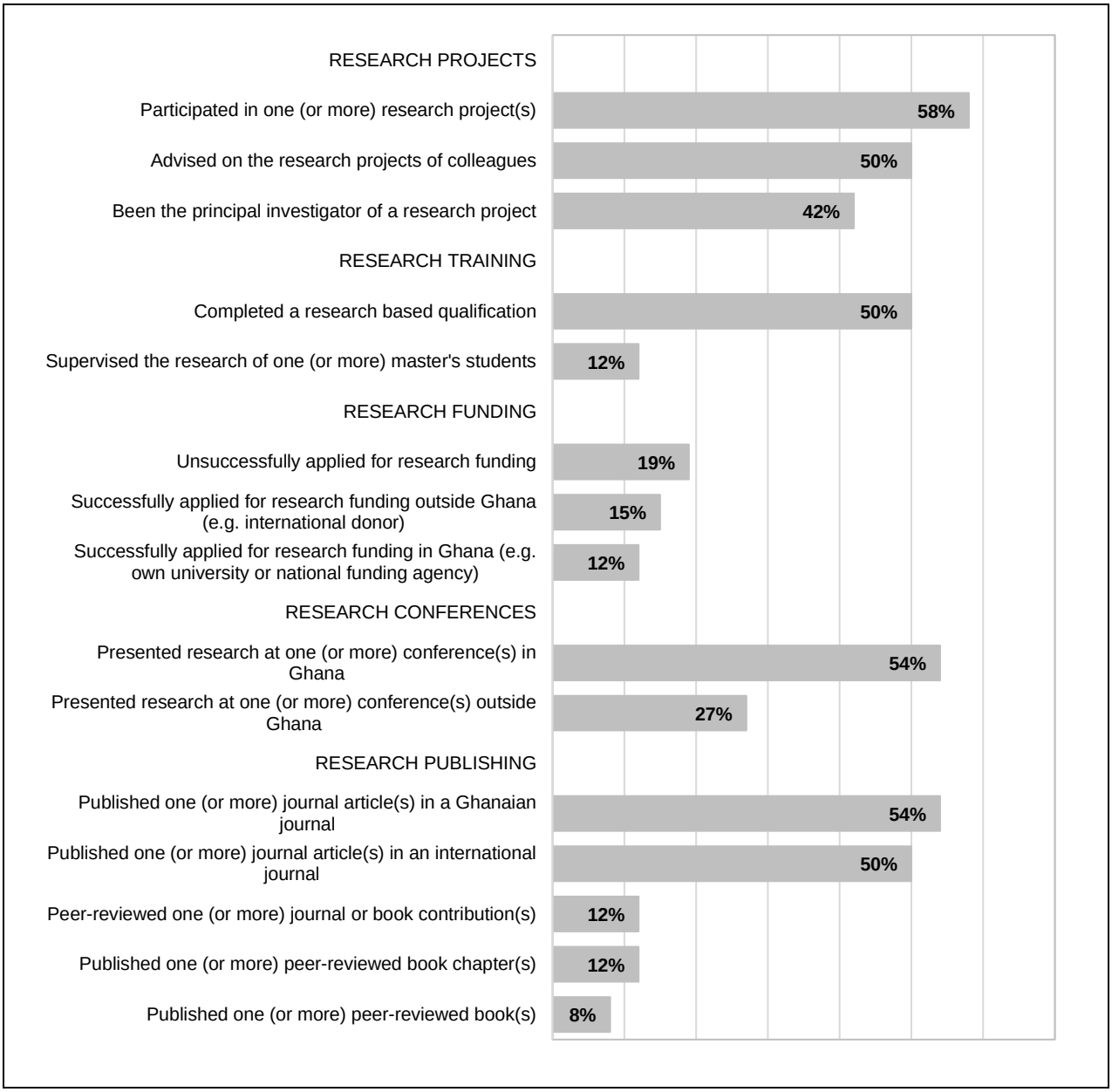


Figure 1 Research activities of academic librarians in the past five years (N=26)

Participation in a research project was the most frequently mentioned research activity (58%). It is likely that project participation also underpinned some of the other activities. It further emerged that relatively small percentages of respondents had previously applied for funding (either successfully or unsuccessfully; 12%-19%) or had been supervising master's students (12%). Despite the relative lack of experience with funding, 54% had presented at national conferences and the same percentage had published research in a Ghanaian journal. Of particular interest is that half of the respondents had completed a research-based qualification in the preceding five-year period. It could therefore be argued that the other

research activities might have emanated from the respondent's role as a research student. This line of thought was subsequently pursued in further analyses, by means of a series of cross-tabulations between whether a respondent had completed a research qualification and every other research activity. Table 2 presents the results. The phi coefficient was used to measure the degree of association between the different sets of dichotomous (yes/no) variables. Typically, a value of between 0.30 and 0.49 indicates a moderate relationship between two dichotomies (Palant 2016).

For eight of the 14 cross-tabulations in Table 2, the value of the phi coefficient ranges between 0.30 and 0.49 (grey shaded cells). All these coefficients represent medium sized associations between having completed a research-based qualification and the other research activities. The associations with a research qualification are highest for presenting at an international conference (0.434) and having international research funding (0.426). Overall, completion of a research qualification seems to correlate well with having opportunities and resources related to project participation, funding, conference participation and publishing.

Information about the availability of opportunities and resources for research were gathered indirectly from the librarians' perceived barriers to research. The respondents were presented with a list of twenty-six potential barriers. For each, they had to indicate the degree to which they experience it as a barrier. Figure 2 reports seven barriers only, which were the ones rated by at least half of the respondents (50%) as a barrier to research – either 'to a large extent' or 'to some extent'. From these, it can be deduced that the research challenges faced by librarians are duty-related (time, schedules and workload), people related (networks and mentors) and money related (funding).

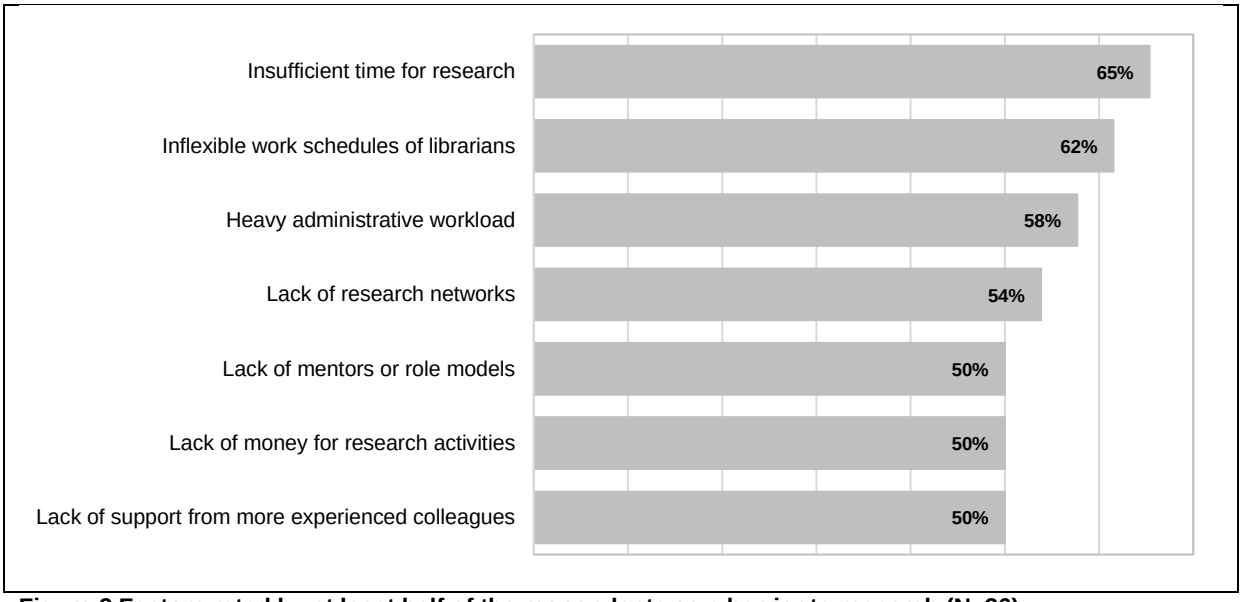


Figure 2 Factors rated by at least half of the respondents as a barrier to research (N=26)

Finally, the librarians were asked about their reasons for doing research. For each of twenty-three possible reasons, they had to indicate the extent to which that reason served as a motivation. Figure 3 shows the reasons considered by at least 50% of respondents as a motivating factor, either 'to a large extent' or 'to some extent'. From Figure 3, both intrinsic and extrinsic reasons are evident. The overwhelming majority of librarians have academic aspirations, namely, to contribute to their knowledge field and to become experts, better skilled and recognised by their peers. These aspirations are fuelled by an intrinsic desire to experience a sense of joy and achievement. Strong altruistic undertones are also present, as the librarians want to create opportunities for others and contribute to society through their research. Extrinsic motivations are inescapable, given that the librarians want to do research to satisfy performance appraisal requirements, be promoted and increase their income. Finally, collaborating with others, publishing in journals and being cited by others – the three foci of the next section of this paper – seem to be high on the agenda of academic librarians who are in possession of a master's degree as their highest qualification.

4.2 Research production and research visibility

Based on the bibliometric study, academic librarians in Ghana in the period 2005 to 2015 had published, on average, five to six journal articles a year (Figure 4). In three separate years (2010, 2012 and 2015) the annual article output significantly exceeded those in the other years. These years also reflect the largest numbers of Ghanaian article authors (13, 15 and 23 respectively). Additional analyses revealed that forty-eight Ghanaian authors were responsible for the eighty-seven articles in the total period, and 56% of the forty-eight authors had produced only one article in the entire period.

Table 2 Cross-tabulation between having completed a research qualification and participating in 14 other research activities

		Completed a research-based qualification in the past five years				
		Yes (n=13)		No (n=13)		
In the past five years the librarian …		Count	%	Count	%	Total
Participated in one (or more) research project(s)	**Yes**	10	77%	5	38%	15
Phi coefficient = 0.389	**No**	3	23%	8	62%	11
Been the principal investigator of a research project	**Yes**	8	62%	3	23%	11
Phi coefficient = 0.389	**No**	5	38%	10	77%	15
Advised on the research projects of colleagues	**Yes**	8	62%	5	38%	13
Phi coefficient = 0.231	**No**	5	38%	8	62%	13
Supervised the research of one (or more) master's students	**Yes**	1	8%	2	15%	3
Phi coefficient = -0.120	**No**	12	92%	11	85%	23
Unsuccessfully applied for research funding	**Yes**	3	23%	2	15%	5
Phi coefficient = 0.098	**No**	10	77%	11	85%	21
Successfully applied for research funding in Ghana	**Yes**	3	23%	0	0%	3
Phi coefficient = 0.361	**No**	10	77%	13	100%	23
Successfully applied for research funding outside Ghana	**Yes**	4	31%	0	0%	4
Phi coefficient = 0.426	**No**	9	69%	13	100%	22
Presented research at one (or more) conference(s) in Ghana	**Yes**	9	69%	5	38%	14
Phi coefficient = 0.309	**No**	4	31%	8	62%	12
Presented research at one (or more) conference(s) outside Ghana	**Yes**	6	46%	1	8%	7
Phi coefficient = 0.434	**No**	7	54%	12	92%	19
Published one (or more) journal article(s) in a Ghanaian journal	**Yes**	8	62%	6	46%	14
Phi coefficient = 0.154	**No**	5	38%	7	54%	12
Published one (or more) journal article(s) in an international journal	**Yes**	9	69%	4	31%	13
Phi coefficient = 0.385	**No**	4	31%	9	69%	13
Published one (or more) peer-reviewed book chapter(s)	**Yes**	3	23%	0	0%	3
Phi coefficient = 0.361	**No**	10	77%	13	100%	23
Published one (or more) peer-reviewed book(s)	**Yes**	1	8%	1	8%	2
Phi coefficient = 0.000	**No**	12	92%	12	92%	24
Peer-reviewed one (or more) journal or book contribution(s)	**Yes**	2	15%	1	8%	3
Phi coefficient = 0.120	**No**	11	85%	12	92%	23

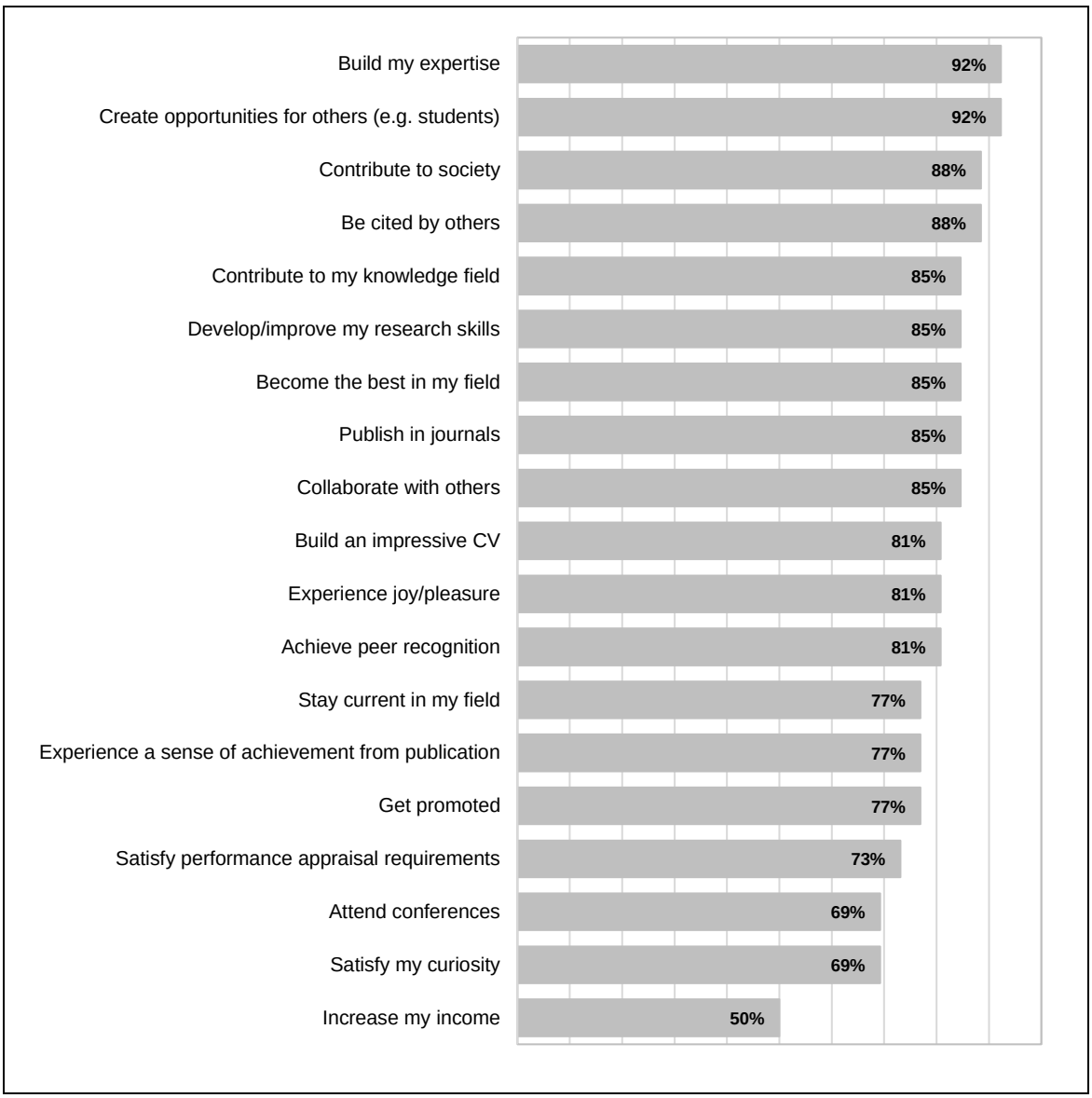
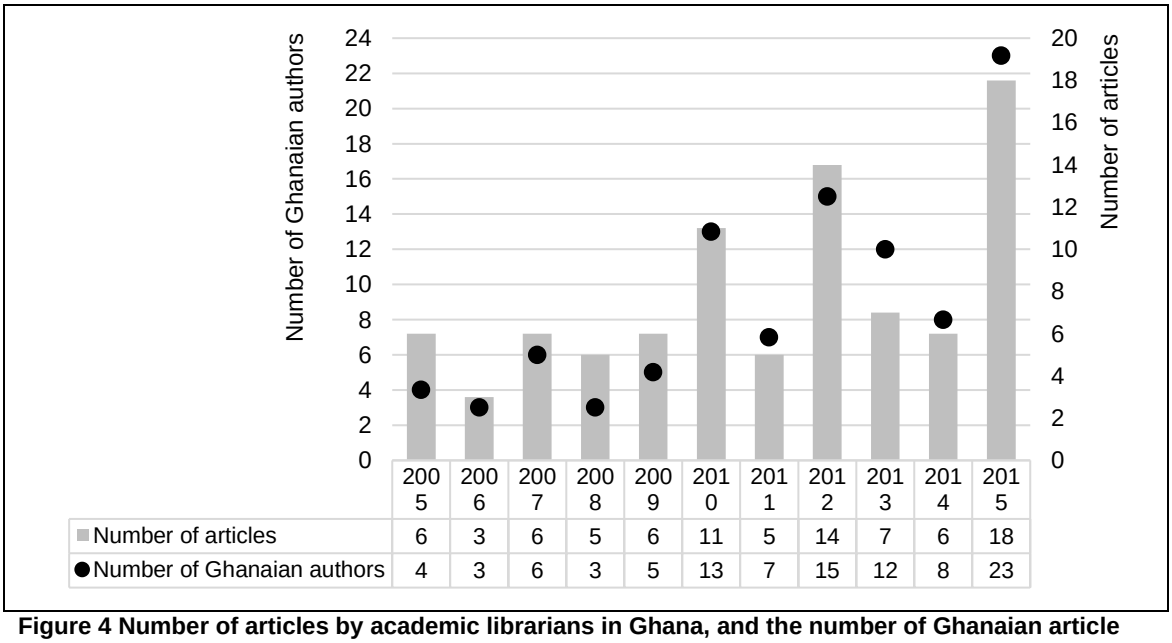


Figure 3 Factors rated by at least half of the respondents as a motivation for research (N=26)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of articles	6	3	6	5	6	11	5	14	7	6	18
Number of Ghanaian authors	4	3	6	3	5	13	7	15	12	8	23

Figure 4 Number of articles by academic librarians in Ghana, and the number of Ghanaian article authors, by publication year (2005 to 2015)

Close to half (46%) of all eighty-seven articles are single-authored (Figure 5). Although this implies that 54% of articles are co-authored, 38% of all articles were co-authored by individuals from a single university. Only 9% of articles involved co-authorship between different Ghanaian institutions and 7% of articles involved international co-authorship. There is no evidence of an expanded collaboration network, as two authors represent the average number of authors per article in both categories of national co-authorship. In instances of international co-authorship, the average number is three. The Ghanaian academic librarians collaborated internationally with five countries: South Africa (five articles), Nigeria (two articles) and Senegal, Uganda and the USA (one article each).

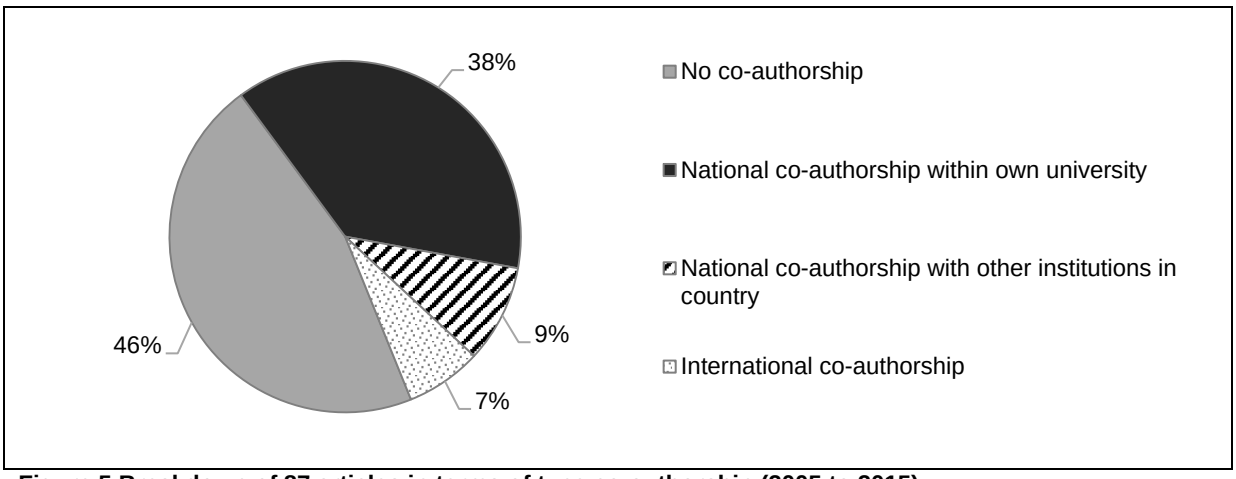
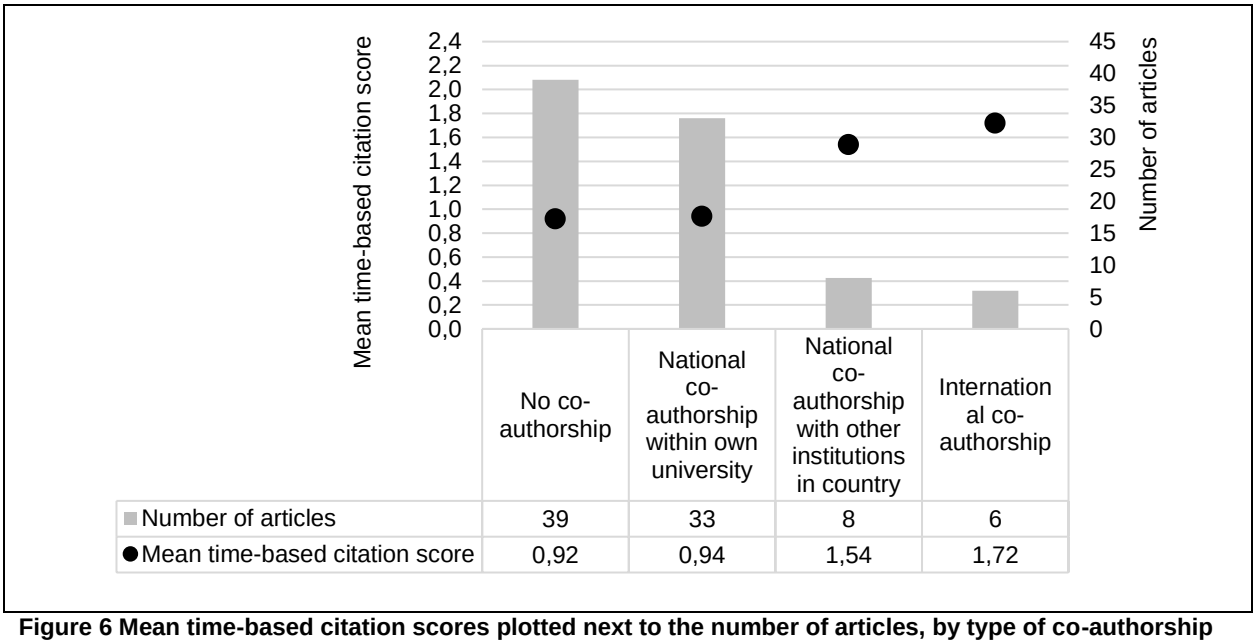


Figure 5 Breakdown of 87 articles in terms of type co-authorship (2005 to 2015)

Figure 6 shows the mean time-based citation scores for each category of co-authorship, plotted against the number of articles in that category. The mean time-based citation score, indicating research visibility, is highest for the six internationally co-authored articles (1.7 citations per year, on average), ahead of the eight articles involving national co-authorship between different institutions (1.5). Articles co-authored within a single institution and those without any co-authorship attracted less than one citation per year, on average.



	No co-authorship	National co-authorship within own university	National co-authorship with other institutions in country	International co-authorship
Number of articles	39	33	8	6
Mean time-based citation score	0,92	0,94	1,54	1,72

Figure 6 Mean time-based citation scores plotted next to the number of articles, by type of co-authorship
Note: The 'No authorship' category had one outlier article that has been excluded in Figure 6, as it would inflate the mean time-based citation score. The relevant article, published in 2015, had forty-six citations by the end of 2018, resulting in an article specific time-based citation score of 15.3. If the article were to be included here, it would have artificially inflated the mean time-based citation score of the 'No authorship' category (from 0.92 to 1.28).

Figure 7 shows the distribution of articles according to journal classification. The journal classification refers to the indexing of journals in Scopus and/or WoS, and whether a journal could be located in LISA and in Beall's list of potentially predatory journals. As can be seen, 49% of articles are published in journals indexed in Scopus and/or WoS, the two major international bibliographic databases. A considerable share of articles (61%) are to be found in journals indexed in LISA, of

which 20% in journals in LISA only. This indicates that the articles of academic librarians are very much orientated towards the LIS field. Overall, 7% of articles are published in potentially predatory journals (based on Beall's list 2019). No articles are published in journals that are indexed in WoS only. Where articles do appear in WoS journals, those journals are always also indexed in Scopus (25%).

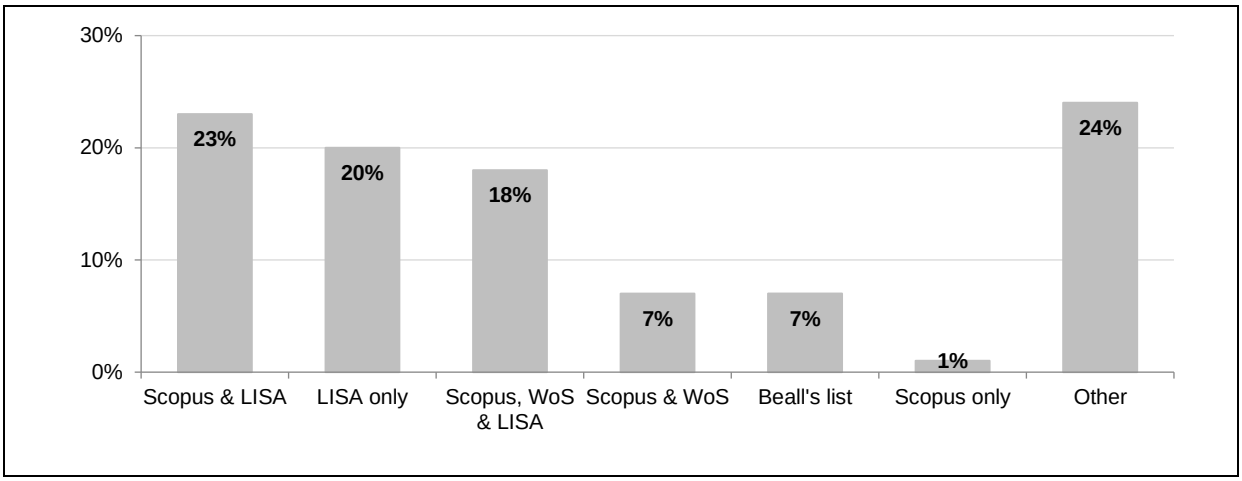
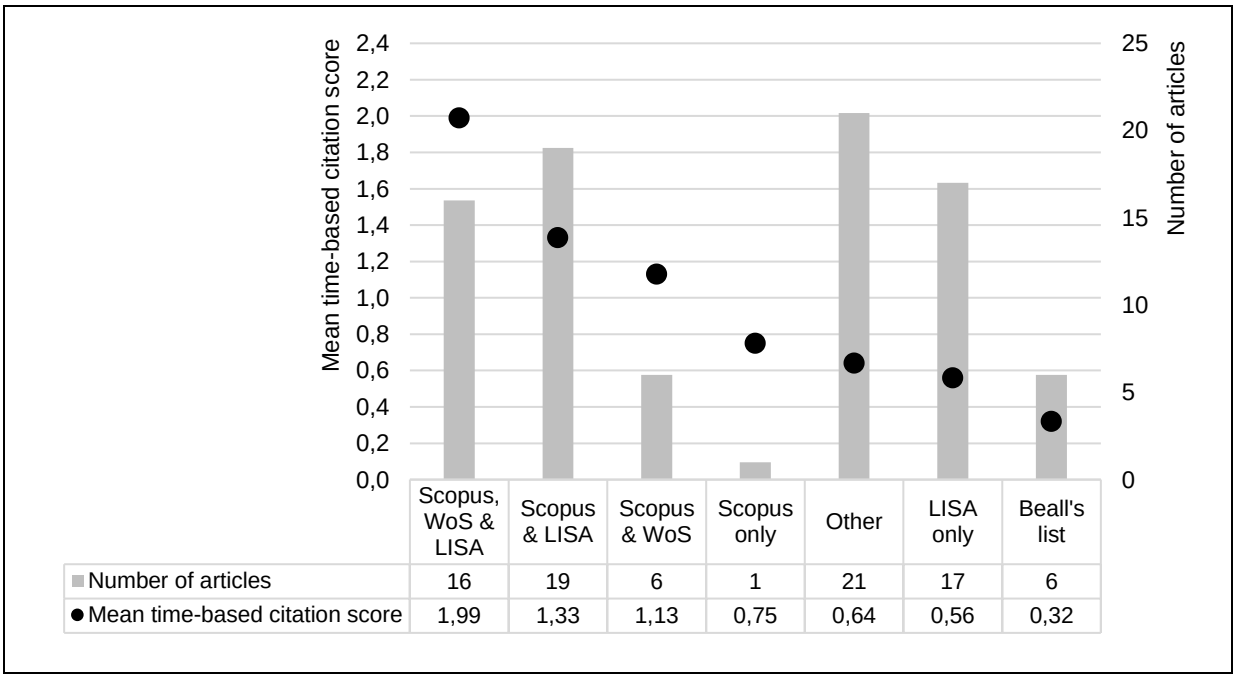


Figure 7 Breakdown of 87 articles in terms of journal classification (2005 to 2015)

Figure 8 shows the mean time-based citation scores plotted next to the actual number of articles, by journal classification. The highest mean time-based citation score was found for sixteen articles in journals that are indexed in Scopus, WoS and LISA (1.99). Articles in LISA-indexed journals only, on average, attracted less than one citation per year (0.56). This citation score increases substantially when a LISA-indexed journal is also indexed in Scopus (1.33) and in both Scopus and WoS (1.99). The six articles in journals on Beall's list had the lowest mean time-based citation score (0.32).

The eighty-seven articles appear in thirty-six journals. Table 3 shows the 'top' fourteen journals that the academic librarians published in; these are journals containing at least two of the eighty-seven articles analysed. The top three journals (*Ghana Library Journal*, *Library Philosophy and Practice*, and *Journal of Science and Technology)* are not indexed in either Scopus or WoS although two of the three journals are actively indexed in LISA. Together, the three journals account for 39% (34 out of 87) of all articles published by the librarians. Two of the three journals are also published in Ghana and the third is an international journal. Moreover, only five of the fourteen journals are indexed in either Scopus or WoS. This is an indication that many librarians do not publish in journals indexed by WoS or Scopus, which affects their research visibility.



	Scopus, WoS & LISA	Scopus & LISA	Scopus & WoS	Scopus only	Other	LISA only	Beall's list
Number of articles	16	19	6	1	21	17	6
Mean time-based citation score	1,99	1,33	1,13	0,75	0,64	0,56	0,32

Figure 8 Mean time-based citation scores plotted next to the number of articles, by journal classification
Note: The 'Scopus & LISA' category in Figure 8 excludes the same outlier article that is excluded in Figure 6. If this article were to be included here, it will artificially inflate the mean time-based citation score from 1.33 to 2.03.

Table 3 Journals in which academic librarians published at least two articles (2005 to 2015)

Journals	Count	Journal classification	Publisher
Ghana Library Journal	13	LISA only	Ghana Library Association
Library Philosophy and Practice	12	Scopus & LISA	University Libraries of the University of Nebraska-Lincoln, USA
Journal of Science and Technology	9	Other	KNUST, Ghana
Information Development	8	Scopus, WoS & LISA	Sage Publications Ltd., United Kingdom (UK)
African Journal of Library, Archives and Information Science	4	Scopus & WoS	Archlib & Information Services Ltd., Nigeria
African Research and Documentation	3	LISA only	Standing Conference on Library Materials on Africa (SCOLMA), UK
Journal of Appropriate Librarianship and Information Work in Southern Africa	2	Other	University of KwaZulu-Natal, South Africa
Journal of Balkan Libraries Union	2	Other	Trakya University, Turkey
Journal of Interlibrary Loan, Document Delivery and Electronic Reserve	2	Scopus & LISA	Taylor & Francis Group Ltd., UK
Library and Archival Security	2	Scopus & LISA	Taylor & Francis Group Ltd., UK
Library Review	2	Scopus, WoS & LISA	Emerald Group Publishing Ltd., UK
Records Management Journal	2	Scopus, WoS & LISA	Emerald Group Publishing Ltd., UK
Research Review of the Institute of African Studies	2	Other	Institute of African Studies, University of Ghana
UDS International Journal of Development	2	Other	University for Development Studies (UDS), Ghana

5 Discussion

Based on the findings of the web survey and bibliometric study, a number of observations emerged as to how academic librarians at the public universities in Ghana fulfil their research and publication mandate. Most of the observations lean towards a series of 'negativities'. For instance, the volume of article output by academic librarians in Ghana might be considered too low in order for them to be taken seriously as researchers. Although eighteen articles were produced by twenty-three academic librarians in 2015, only about a third of all academic librarians participated in article output at that time. Academic librarians active in article production also seem to be isolated in their scholarship as reflected in the large proportion of single-authored articles and articles produced by individuals from the same institution, and a tendency to publish mainly in local journals. Article authorship also bears some relation to having completed a research-based qualification, which is not surprising as postgraduate opportunities can provide the necessary resources for research. Moreover, the visibility of research, as reflected by citations in Google Scholar, is limited, with less than one citation per article, on average, per year. Although some might argue that one citation per year is satisfactory, it needs to be remembered that self-citations were not controlled for in the current study and also that the study did not investigate the quality of the citing data in Google Scholar. One way to investigate the latter would be to verify, extract and systematically classify the web addresses of the citing sources (Prins et al. 2016). On the other hand, it could be argued that any 'negative' observation – such as that academic librarians seldom collaborate outside their own university, or that they mainly publish in local journals, or that they enjoy little research visibility – is secondary to the fact that some librarians have demonstrated that it is indeed possible to be research active and well cited. The mentoring of novice and unproductive researchers by those researchers who are productive could therefore be a viable strategy to expand existing practices of research and publication (Wadesango 2014). Evidence of the value of informal mentoring, formal mentoring programmes and writing groups for early career academic librarians does exist (Ackerman, Hunter & Wilkinson 2018).

Irrespective of whether a negative or positive reflection is provided, it is common knowledge that the work of academic librarians constitutes a great obstacle to research, especially the strict work schedules which often give them little or no time at all to conduct research (Ochai & Nedosa 1998). This difficulty has paved the way for calls for librarians to be permitted to have time at work in which they are free and able to conduct research (Onowakpor & Tiemo 2006, Moahi 2007). According to the web survey, academic librarians spend about 20% of their working time (median) on research, which translates into about one day per week. Arguably, in the context of the other survey responses, it could mean that some librarians were allocated time for research in order to complete a research-based qualification. It is also important to note that the time spent by the average Ghanaian academic librarian on research does not differ from the same for the average

academic in sub-Saharan Africa. In a multiple country survey of academics in sub-Saharan Africa (Beaudry, Mouton & Prozesky 2018), lecturers and senior lecturers also reported to spend about 20% (median) of their working time on research. The difference is that, for academic librarians, the bulk of their duties are managerial and administrative whereas, for academic lecturers, they are related to undergraduate teaching. All academics (whether in a library or in a department) can make the same request – that is, for more time for research.

Future studies should therefore focus on how academic librarians optimise the limited time and other resources available to them and the effects of those optimisations. Therefore, some instances need to be taken into consideration. For example, under what conditions does the time that academic librarians have available for research (as a postgraduate student, a postgraduate supervisor or a 'lone' researcher) give rise to article publications in peer-reviewed journals of good standing? Also, how does the research contribute to advancing knowledge domains and practice settings linked to LIS? The funding strategies of Ghanaian academic librarians – or perhaps the lack therefore – would also need to be investigated. A recent survey of the Ghanaian corresponding authors of co-authored articles across different fields revealed that funding was largely from the authors' own pocket or from their own institution (Owusu-Nimo & Boshoff 2017).

Moreover, making research results visible can increase the chances of the outputs of academic librarians being used and cited by the wider research community. The reality is that articles in journals published in Africa – a main publication outlet for Ghanaian academic librarians – are not well-represented in the main bibliographic databases and hence not visible. Publication in mainstream, international journals is often interpreted as reflecting research quality and, for that reason, seen as the 'holy grail' of publishing. Chavarro, Tang and Ràfols (2017), however, argue that the value of local journals should not be diminished. According to the authors, local journals fulfil a particular communication function in low- and middle-income countries. The relevant functions are training (for example, as the introduction to academic publishing, paving the way to eventual publication in mainstream journals), knowledge bridging (taking concepts and methods from mainstream journals and adapting those for the local context and local readers) and filling knowledge gaps (to do justice to research topics and focus areas that are neglected in mainstream journals). The mentoring of unproductive researchers by productive researchers, referred to elsewhere, should thus also continue to target local and African-based journals for the above reasons.

Finally, although there is a clear need for more international collaborations by academic librarians in Ghana in order to increase their research visibility and to work on cutting-edge research topics, alternative strategies for achieving the latter need to be explored in the present absence of international collaborations. Onyancha (2018), for instance, calls for academic librarians to ride the current metrics tide by entering the space of bibliometrics and altmetrics more actively. A case could thus be made for academic librarians to engage in bibliometric studies more frequently, by constructing datasets of strategically important science fields from the publication databases to which their universities subscribe, as well as from institutional repositories and publicly accessible databases such as Google Scholar. The analyses could be done either by individual researchers or by teams of local researchers that involve representatives of the chosen field of bibliometric study (renewable energy, for example). According to Zhiyi et al. (2018), academic librarians could be of service to their institutions, especially in the institution's aspiration for achieving world-class university status, by developing bibliometric indicators to benchmark the national universities against the best in the world in strategic fields.

6 Conclusion

The findings of the study show that, in a given context, it seems possible for some academic librarians to be research productive but, at the same time, impossible for others to be so. Productive researchers normally do research by leading projects or by participating in projects (beyond their postgraduate studies), by supervising postgraduate students, by collaborating with peers, and by accessing research funding. However, if most of these conditions are out of reach of the average academic librarian, how can they fulfil their research and publication obligation as defined in their conditions of service? Without institutionalised efforts at addressing these hindrances, a significant segment of librarians will continue to perceive research and publication as luxuries that they cannot realistically attain. Apart from Ghanaian universities addressing the challenge, the professional body of the Ghana Library Association should conduct continuing professional development workshops to support librarians in managing their administrative workload against their expected research activity, research acceleration and professional development.

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