Information behaviour and information practices of academic librarians: a scoping review to guide studies on their learning in practice

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Abstract

Introduction. This paper reports on a scoping review of the literature on the information behaviour and information practices of academic librarians to determine how their information activities are linked to knowledge and skills development (i.e., their learning).
Method. A scoping study of peer reviewed scholarly papers published in English between 2000 and 2019 was conducted. Over 5600 papers, retrieved from seven scholarly databases, were screened, based on title, keywords and abstract, resulting in 126 papers for analysis.
Analysis. Data were extracted to provide an overview of the extent, range and scope of the selected literature. MS Excel and MS Word was used to sort, group and thematically analyse the data.
Results. The review provided valuable insight into the information behaviour and information practices of academic librarians. It also identified several information activities librarians engage in to ensure they have sufficient knowledge and skills (i.e., to learn) to cope with challenges in their work environment.
Conclusions. The scoping review served as a useful tool to get a notion of the scope of studies on the topic, addressing the research questions, and identifying opportunities for further investigation.

Keywords: Information behaviour, academic libraries

Introduction

The existence of academic libraries can be attributable to the value librarians are adding to teaching, learning and knowledge production and dissemination (Jubb, 2016). Librarians have always been mainly responsible for services such as collection development and acquisitions, cataloguing, circulation, reference and information literacy instruction and training (Allan, 2010; Atkinson, 2016; Cooke *et al.*, 2011).

More recently, academic librarianship has been exposed to vast changes, as a result of stronger institutional focus on research, developments in higher education pedagogy, increased emphasis on research performance measurement and changes in scholarly communications (Bruns *et al.*, 2015; Cox, 2016, 2017; Delaney and Bates, 2015; Hoodless and Pinfield, 2018; Koltay, 2016; Lang *et al.*, 2018; McRostie, 2016; Mwaniki, 2018). Although there is still a need for traditional information services (Fourie and Du Bruyn, 2017; Hoffman *et al.*, 2017), new opportunities emerged in which academic librarians may now develop their contributions stronger towards the shaping of research visions for universities (Appleton, 2018; Atkinson, 2016; White, 2017). Current reports highlight prominent roles in research data management, preservation and curation (Latham, 2017; Yu *et al.*, 2017), research impact and evaluation (Braun, 2017; Thuna and King, 2017), open science and scholarly communication (Ogungbeni *et al.*, 2018; Tenopir *et al.*, 2017) and digital scholarship (Raffaghelli *et al.*, 2016). These developments force libraries to form new partnerships and relationships (Cox *et al.*, 2019; Cox, 2018; Haddow and Mamtora, 2017; Harland, 2017; Lang *et al.*, 2018; McRostie, 2016), change the way they deliver services (Haddow and Mamtora, 2017; Klain Gabbay and Shoham, 2019; Koltay, 2016; Lang *et al.*, 2018; McRostie, 2016), develop new strategies (Appleton, 2018; Cox *et al.*, 2019; Cox, 2018; Pinfield *et al.*, 2017) implement innovation and new technology (Chaithra and Pai, 2018; Joiner, 2018; Lee, 2018; Ponte *et al.*, 2017) and assess current roles and practices (Gwyer, 2018; Johnson, 2019; Mwaniki, 2018). In this dynamic environment, it is understandable that some librarians might feel unprepared for new roles and responsibilities (Decker, 2017; Petek, 2018; Saunders, 2015), as change is more compelling than ever before.

Nevertheless, it seems that several libraries do manage to keep updated and are able to develop their services accordingly. The literature is infused with reports on how libraries effectively respond to

opportunities (Lang *et al.*, 2018; Mwaniki, 2018; Young, 2017). Yet, the literature on how librarians deal with new responsibilities and obtaining knowledge and expertise are less abundant, with even less reports on how they deal with their own information needs.

This motivated an investigation (scoping review) to determine the extent, range (variety), and scope (characteristics) of the evidence on the information behaviour and information practices of academic librarians.

Problem statement

The literature provides clear evidence that librarians are aware of the information needs of their users (Atkinson, 2016; Harland, 2017), yet, there are limited reports on how their own information needs are addressed. Given that they are working in information rich environments, where it is expected from them to be able to deal with sophisticated information questions, it can be assumed that academic librarians may face several information related challenges on a daily base. It is further expected from them to be innovative, up-to-date with new developments in the research arena and to play a leading role in implementing new technology in their workplace, but also to introduce users to this (Cox *et al.*, 2019; Jantz, 2017; Joiner, 2018). How do they manage these expectations, and how do they ensure that they have sufficient knowledge and skills to cope with challenges and stay relevant?

A first approach would be to turn to the literature to determine what have been reported on the information behaviour and information practices of academic librarians and what can be learned from these studies. An initial overview might also enable the identification of areas in need of more empirical research and could provide a starting point for a deeper investigation of the current problem.

Research questions

With this in mind, a scoping review of the literature, guided by the following sub-questions was launched:

1. What is the scope of studies investigating the information behaviour and information practices of academic librarians?
2. What is reported on the information behaviour and information practices of academic librarians?
3. How do academic librarians acquire knowledge, skills and expertise to align their information services to new developments and demands of the research environment?

In the following section, scoping review research as a methodology will be discussed. I will then briefly explains the main key concepts. This will be followed by a discussion of the methodology and the results of the scoping review.

Methodology

Scoping review research

Colquhoun *et al.* (2014:1294) define a scoping review as '*a form of knowledge synthesis that addresses an exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined area or field by systematically searching, selecting, and synthesizing existing knowledge*'. Hanneke *et al.* (2017:3) refer to it as '*a literature mapping process that allows a researcher to examine the "landscape" of the literature based on a particular question of interest*'. The purpose of conducting a scoping review may often be to '*lay the groundwork for a more rigorous systematic review*', while other objectives can be to explore the extent of the literature,

identify boundaries and parameters of a review, or to identify gaps in a body of literature (Arksey and O'Malley, 2005; Hanneke *et al.*, 2017).

Evidence exists of scoping reviews in the academic library literature. Lorenzetti and Powelson (2015) report on a scoping review to explore practices and trends in library mentoring programmes, while Heyns *et al.* (2019) used this methodology to determine generational expectations of academic library leaders. O'Brien *et al.* (2017) found the methodology very useful to explore literature on individual differences in information seeking behaviour and information retrieval of people interacting with information and information systems.

The following stages, as proposed by Arksey and O'Malley (2005), will be followed to execute the current scoping review: identifying the research question; identifying relevant studies; study selection; charting the data; collating, summarising and reporting the results. The study was also guided by the PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation, which was developed by Tricco *et al.* (2018). It is however important to first clarify relevant terminology.

Clarification of key concepts

Academic librarian

In this paper, an academic librarian will be viewed as a professional responsible for providing access to information and information sources as well as delivering services to support the information needs of students, staff, faculty, researchers as well as other users connected to a university or tertiary education institution. Other vocabulary often associated with this concept include research librarian, subject librarian, liaison librarian, reference librarian, information specialist, library and information professional and informationist.

Information behaviour

Several authors, including Bates (2017), Case and Given (2016), Courtright (2007), Savolainen (2007) and Wilson (2000) agree that human information behaviour includes the totality of activities involved in information seeking, information searching as well as supplying, using and sharing of information and can be both purposeful and passive. Information behaviour takes place within specific situations, contexts and in varied roles of people's everyday lives (Savolainen, 2017). For the purpose of this paper, the following all-inclusive definition, by Fourie and Julien (2019, p. 693) will be used, which refers to information behaviour as '*all information-related activities and encounters, including information seeking, information searching, browsing, recognising and expressing information needs, information encountering, information avoidance and information use*'.

Information practices

It has been debated that, because of their generic nature, the two concepts, *information behaviour* and *information practice* are sometimes viewed as umbrella discourses, with little consensus on exact definitions for each concept (Savolainen, 2008; Wilson *et al.*, 2009). Cox (2012:182) reasons the ongoing multivocality because '*there is no one theorist to whom one can turn for a definitive account of the practice approach*'. In this regard Cox (2012, p. 185) reasons that '*all social practices involve information use, creation and seeking, but this does not make them information practices, because only a few practices are specifically information oriented*'. Cox (2013, p. 61) therefore proposes the use of the phrase *information in social practice* as an umbrella term in preference to *information behaviour* or *information practice*.

In spite of these indecisive views, it was decided to use a definition of information practice, devising from collectivism and social constructionist. From this viewpoint, information practices can be defined as a '*set of socially and culturally established ways to identify, seek, use and share the*

information available in various sources such as television, newspapers and the Internet'
(Savolainen, 2008, p. 2).

The framework for the literature search will be discussed as follows.

Literature search strategy

Table 1 presents the inclusion and exclusion criteria of the literature search, the databases used for the search, including the final version of the search strategy.

Inclusion criteria	- Publication years 2000-2019 - Peer-reviewed publications - Full text - English language
Exclusion criteria	- Grey literature, editorials, commentaries, letters, conference announcements or proceedings - Book reviews - Evidence-based library and information practice (EBLIP) - Studies focussing on library products or services, reports on library projects or best practices as it relate to service delivery - Studies focussing on other types of libraries (e.g., school or public libraries) - Studies focussing on library users (not librarians) - Library and information science (LIS) schools or curricula - Other
Databases	- EBSCOhost Includes: Academic Search Complete, ERIC (Education Resource Information Center), Family & Society Studies Worldwide, Humanities Source, Library & Information Science Source, Library, Information Science & Technology Abstracts (LISTA), Emerald Insight - ProQuest Includes: Humanities Index, SciTech Premium Collection, Social Science Premium Collection (which includes Education Collection, Library & Information Science Collection, Linguistics Collection, Politics Collection, Social Science Database, Sociology Collection) - ScienceDirect - Scopus - Web of Science Core Collection
Search string (final version)	[(information behaviour) OR (information behavior) OR (information use) OR (information searching) OR (information seeking) OR (information need*) OR (information encountering) OR (information avoidance) OR (information sharing) OR (knowledge transfer) OR communication OR (information activities) OR (information practice*)] AND [academic OR research OR university OR universities OR (higher education)] AND [librarian* OR (information specialist*) OR (information professional*)] The search was applied to the title, keyword and abstract fields

Table 1: Search strategy summary for the scoping review

Inclusion and exclusion criteria

The search only included full text, peer reviewed scholarly papers published in English between 2000 and 2019. Grey literature, editorials or commentaries, letters, conference announcements or proceedings and book reviews were excluded. In addition, all papers focussing on Evidence-based library and information practice (EBLIP) were omitted. Evidence-based library and information practice (EBLIP) developed from Evidence-based medicine (EBM), which refers to the application of the interdisciplinary approach known as evidence-based practice (EBP). This movement claims that all practical decisions made within the library should be based on research studies and that these research studies should be selected and interpreted according to some specific norms stipulated for evidence-based practice (EBP) (Hjørland, 2011). A bibliometric study of practice theory in library and information studies performed by Pilerot *et al.* (2017) also omitted this term as it was viewed as unrelated to the topic of *practice theory*.

Other studies excluded include those focussing on products or services, reports on library projects, studies focussing on library users and other types of libraries (e.g., school or public libraries) and studies not focussing on information activities as main object.

Search results

Databases listed in Table 1 relate to the library and information science discipline. Each database has unique features and differ in terms of their use of controlled vocabulary, thesauri and coverage. To ensure that most papers on the topic were covered, Google Scholar was searched for cited and related papers, of which 75 were included to be reviewed (based on their titles). Study selection from each database is presented in Table 2.

Database	Papers identified in initial search	After limited to inclusion criteria	Duplicates removed	Total included for reviewing	Excluded	Accepted for inclusion in synthesis
EBSCO Host (selected databases)	1369	799	408	391	Best practices: 110 Book reviews: 1 Conferences / meetings: 15 EBLIP: 5 LIS schools or curricula: 25 User needs or studies: 174 Not academic libraries: 4 Other: 6	51
Emerald Insight	293	282	8	274	Best practices: 20 Book reviews: 3 Conferences / meetings: 2 EBLIP: 3 LIS schools or curricula: 1 User needs or studies: 152 Not academic libraries: 54 Other: 31	8
ProQuest	1549	31	3	28	Best practices: 1 Book reviews: 0 Conferences / meetings: 0 EBLIP: 0 LIS schools or curricula: 0 User needs or studies: 10 Not academic libraries: 3 Other: 0	14
ScienceDirect	1068	378	0	378	Best practices: 98 Book reviews: 0 Conferences / meetings: 1 EBLIP: 2 LIS schools or curricula: 12 User needs or studies: 122 Not academic libraries: 10 Other: 36	97
Scopus	734	154	0	154	Best practices: 32 Book reviews: 0 Conferences / meetings: 1 EBLIP: 10 LIS schools or curricula: 6 User needs or studies: 80 Not academic libraries: 10 Other: 3	12
Web of Science Core Collection	521	89	1	88	Best practices: 8 Book reviews: 2 Conferences / meetings: 0 EBLIP: 3 LIS schools or curricula: 5 User needs or studies: 56 Not academic libraries: 3 Other: 1	10
Google Scholar	128	0	0	75	0	75
TOTAL:	**5662**	**1733**	**420**	**1388**	**1121**	**267**

Table 2: Study selection from each database

Study selection

A single list was compiled of the selected studies from all databases. Duplicates were removed, resulting in a list of 267 full-text papers. Although the search terms appeared in the title, keyword or abstract fields, a closer reading of the full papers determined that some of these studies focused on the information needs of users or library activities (not on information activities), some reported on specific projects or programmes, and a few were authors' opinions, and not considering information activities. From these, 141 papers were removed, resulted in the final list of 126 papers. This process is presented in Figure 1.
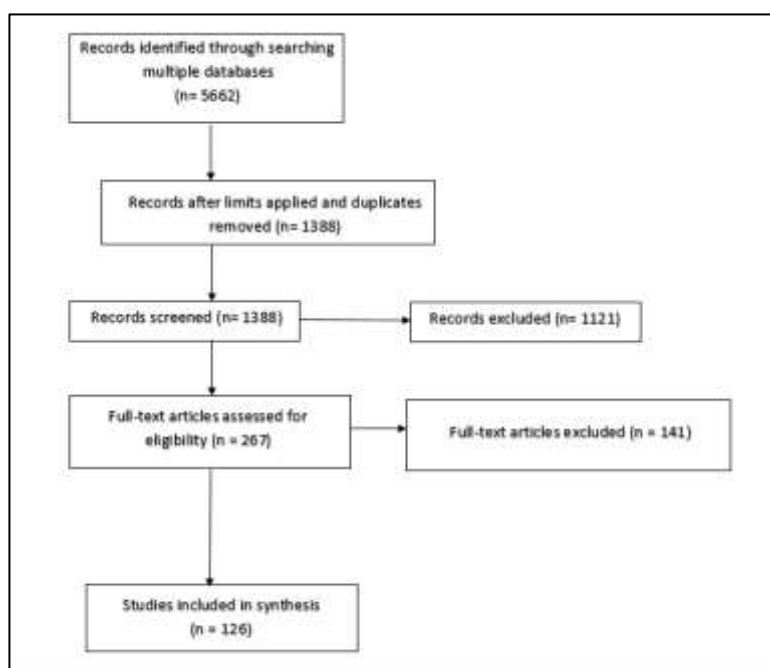
Figure 1: Flow diagram of scoping process

Data extraction and mapping

An Excel spreadsheet was used to extract data from the 126 selected papers. Based on the research questions, the following categories were created to guide the data analysis: journal title, year, country of origin of the first author, research approach, data collection method and main information activity (e.g., information seeking, information practice, information sharing, information usage and information needs). Data was further collated and categorised. The results of the scoping review will be discussed in the following section.

Results

Scope and labelling of studies

Although this study aims to gain insight on information behaviour and information practices as it has been theoretically defined, most selected papers focus on activities implied to be part of information practices (e.g. mentoring as a process of information sharing). This may link to arguments previously mentioned in this paper that '*all social practices involve information use, creation and seeking, but this does not make them information practices, because only a few practices are specifically information oriented*' (Cox, 2012, p. 185). Since the aim of this review is to determine what librarians *do* to develop expertise in their workplace, it was decided to include all practices relating to *information activities* (although some may not explicitly be information practices *per se*).

The selected papers are spread over 51 journal titles. The *Journal of Academic Librarianship* seems to be the most popular source for authors, holding 34 of the 126 (27%) papers, followed by *Library and Information Science Research* (12/126; 10%); *College and Research Libraries* (7/126; 6%); *Library Philosophy and Practice* (6/126; 10%); *Library Hi Tech* (5/126; 4%) and *Library Management* (4/126; 3%). Other titles appear only once or twice on the list. The majority of these journals focus on practical applications significant to academic libraries (which are the nature of the reviewed literature).

Qualitative and quantitative research designs are equally represented with each consisting of 41% of the studies, while 18% of the reviewed studies followed a mixed methodology design. Questionnaires are the preferred method for data collection, utilised in 38% of the studies, followed by reports on case studies (14%), interviews (13%), literature reviews (10%) and citation analysis (5%). The following methods were also used once in the reviewed studies: a longitudinal case study, bibliometric analysis, citation analysis, researcher-as-participant self-reflection activities and a scoping review.

Several studies used a combination of methods, such as questionnaires and interviews (9%), questionnaires and citation analysis (2%), questionnaires, interviews and document research (1%), observations and interviews (1%), interviews and a citation analysis (1%), interviews and card sorting (1%), informal interviews and a report from a pilot project (1%), focus group interviews and personal logbooks (1%), and content analysis and citation analysis (1%).

The country where a study was done may shed light on the context of a study (e.g., developing countries, opposed to developed countries). More than 50 per cent of the studies are from the United States (US). Countries represented in the studies are listed in Figure 2.
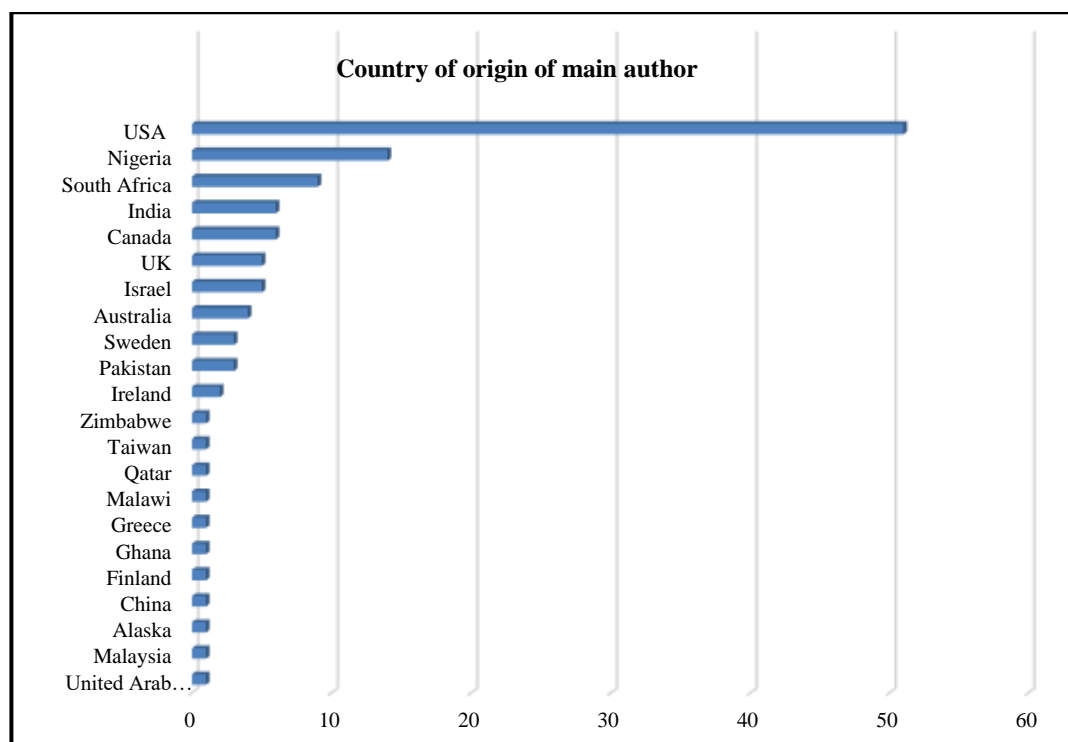

Figure 2: Countries represented in the selected studies (*N* = 126)

For 84 studies, librarians are the population of investigation, while five used librarians together with faculty, one educators, representatives of professional bodies and librarians and one library organisations. Another study used nursing students, a professor and a librarian. There is also one study, which collected data from undergraduate students together with librarians.

Information behaviour and information practices of academic librarians

The content of the selected papers was collated, categorised, and arranged according to main themes. This was analysed to determine what are reported regarding the information activities of academic librarians. The next section will report these findings.

Theoretical roots

Transformational learning theory	(Attebury, 2017; Hess, 2015)
Communities of practice (Lave and Wenger)	(Belzowski, *et al*., 2013; Clifton, *et al*., 2017; Smith, 2016; Wittenberg, *et al*., 2018)
Social constructionism	(Boudreau *et al.*, 2014; Julien and Given, 2002; Tewell, 2018)
Bandura's four sources of self-efficacy	(Bronstein and Tzivian, 2013)
Legitimate peripheral participation	(Dabengwa *et al.*, 2019)
Social positioning theory	(Julien and Given, 2002)
Symbolic interactionism	(Julien and Pecoskie, 2009)
Social interaction as rituals of deference and demeanor (Goffman)	(Julien and Pecoskie, 2009)
Knotworking theory (cultural–historical activity theory)	(Kaatrakoski and Lahikainen, 2016)
Organisational socialisation theory	(Lee *et al.*, 2016)
Theory of work values	(Moniarou-Papaconstantinou and Triantafyllou, 2015)
Practice theory	(Brown and Ortega, 2005; Pilerot and Lindberg, 2018)
Diffusion of innovations theory	(Rodriguez, 2010)
Organisational lag model	(Rodriguez, 2010)
Information overload	(Shachaf *et al.*, 2016)
Critical information literacy approach	(Tewell, 2018)
Zones of intervention (Kuhlthau)	(Fourie, 2013)
Zones of proximal development (Vygotsky)	(Fourie, 2013)

Table 3: Theories used in selected studies

Main focus of studies

The content of each study was divided into categories according to the focus of the research (according to the researcher's own interpretation). These concepts are listed, grouped, and illustrated in Figure 3.
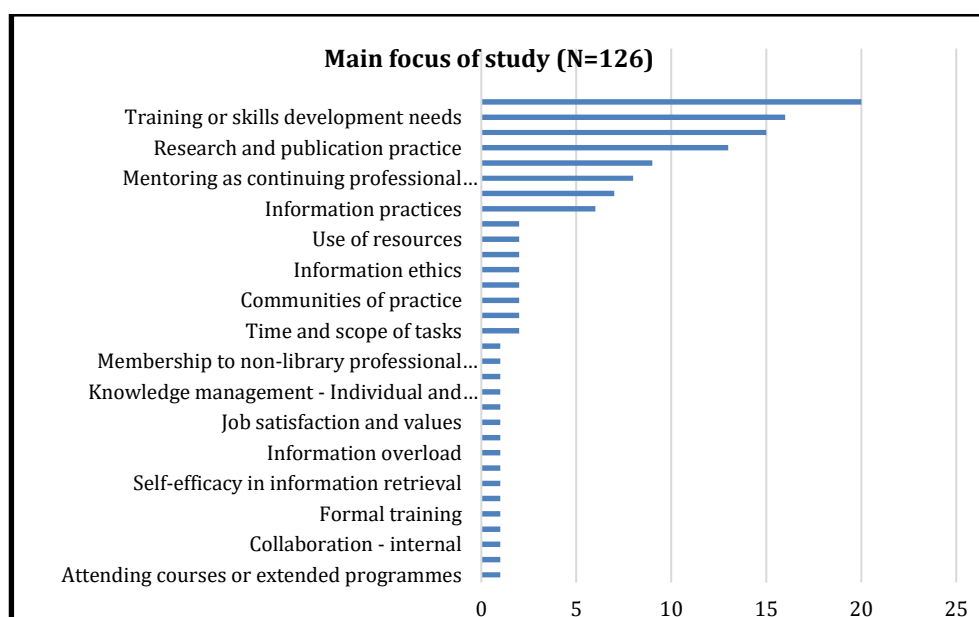

Figure 3: Focus of studies (*N* = 126)

The focus of most of the reviewed studies is on information use – particularly on technology and information sources. Since an objective of this study is to determine what librarians do to obtain knowledge and skills in their workplace, their intentional information activities were used as categories in the analysis (e.g. discussion groups, listservs, journal clubs, etc.).

Focus on information activities

The next step was to determine what information activities were addressed in the different papers. This was determined by analysing the content of the papers. Some authors explicitly specify the broader term in the title, for example information behaviour (Fourie, 2012a; McDonald *et al.*, 2015), information practice (Perryman, 2008) or information literacy practices (Anyaoku *et al.*, 2015). Others refer to the specific information activity in the title, for example information seeking behaviour (Brown and Ortega, 2005) and information retrieval (Bronstein and Tzivian, 2013). Other authors focus on a combination of activities (e.g. information use and information sharing), for example in the study reported by Batool and Asghar (2012). A few authors also use the terms information behaviour and information practice as comprehensive or umbrella terms for various activities, without being specific e.g., Brown and Ortega (2005) and Perryman (2008). Several authors do not specifically refer to information behaviour and information practice *per se*, but the researcher used the definitions (explained previously in this paper) to categorise these papers according to information activity themes. These are presented in Figure 4.
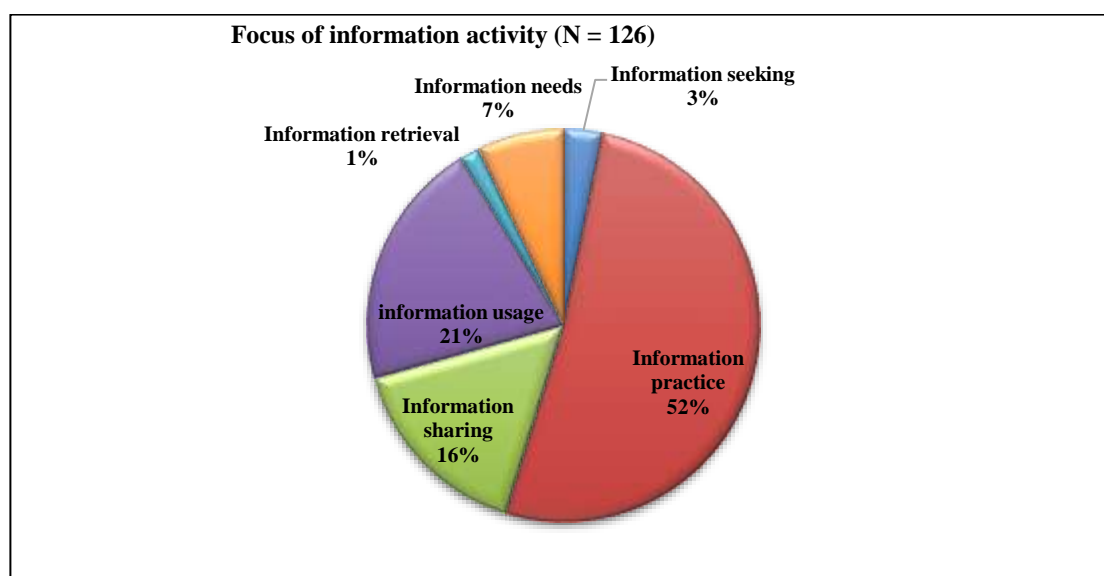

Figure 4: Focus on information activity (N = 126)

Specific focus related to information activities

The content of each paper was further demarcated to identify specific detail related to the information activities. Findings from these papers were grouped together under specific main themes and will be discussed in the following section.

Information needs

A few studies report on librarians' needs for information to enhance their skills, as related to technology (Anyaoku *et al.*, 2015; Enakrire, 2015; Haliso, 2011; Haneefa and Shukkoor, 2010; Hoskins, 2005; Husain and Nazim, 2015; Kaur and Gupta, 2015; Talab and Masoumeh, 2012) as well as their teaching roles (Carroll and Klipfel, 2019; Dabengwa *et al.*, 2019; Julien and Pecoskie, 2009; Miller and Minkin, 2016; Snavely and Dewald, 2011). They also need information to improve their

general work related abilities (Florance *et al.*, 2002; Johnston and Williams, 2015; Klain-Gabbay and Shoham, 2016; Schrader *et al.*, 2012; Wittenberg *et al.*, 2018). The literature also indicate that the information needs of health librarians are similar to that of their users, but differ from those of other subject librarians (Carlyle, 2008; Wu *et al.*, 2013).

Information seeking behaviour

The information seeking behaviour of academic librarians differ from those of their users (Hanz and McKinnon, 2018; McDonald *et al.*, 2015; Perryman, 2008). Librarians tend to start their searches in library catalogues, and not in commercial databases or free websites, as noticeable from researchers and students (Hanz and McKinnon, 2018). They are feeling confident about their own information seeking behaviour and retrieval skills (Bronstein and Tzivian, 2013; Shachaf *et al.*, 2016).

Information sharing

Librarians share information by means of participation in communities of practice (Belzowski *et al.*, 2013; Delaney *et al.*, 2020; Haliso, 2011; Smith, 2016), electronic mail (Chalmers *et al.*, 2006; Flynn, 2005; Perryman, 2008), listservs (Julien and Given, 2002) and face-to-face meetings (Brown and Ortega, 2005; Chalmers *et al.*, 2006; Keisling and Laning, 2016; Perryman, 2008; Pilerot and Lindberg, 2018). A large number of studies report on social media for information sharing (Adeyoyin, 2005; Aharony, 2009; Ahenkorah-Marfo and Akussah, 2016; Bar-Ilan, 2007; Costello and Bosque, 2010; Kim and Sin, 2016; Magoi *et al.*, 2019; McIntyre and Nicolle, 2008; Okuonghae, 2018; Okuonghae *et al.*, 2018; Quadri and Adebayo Idowu, 2016; Rodriguez, 2010). Although not their preferred method of information sharing, they also use short message service (SMS) (Batool and Asghar, 2012). They utilise personal communication (Brown and Ortega, 2005; Chalmers *et al.*, 2006; Fyn, 2013; McDonald *et al.*, 2015; Pilerot and Lindberg, 2018), online discussion groups (Bronstein and Tzivian, 2013; Brown and Ortega, 2005) and professional writing groups (Sullivan *et al.*, 2013) to share information.

Technology plays an important role in the information activities of librarians and they know how to use it effectively (Adeyoyin, 2005; Ajayi *et al.*, 2013; Ajegbomogun and Busayo, 2011; Boudreau *et al.*, 2014; Chawinga and Selemani, 2017; Ejedafiru and Lucky, 2013; Igun, 2010; Mugwisi and Ocholla, 2003; Anasi *et al.*, 2014; Ntui and Inyang, 2015; Oguche, 2017).

Information resources usage

To address their information needs, librarians will use library databases and collections (Hanz and McKinnon, 2018; McDonald *et al.*, 2015), electronic books (Fourie, 2012a; Hanz and McKinnon, 2018) and scholarly journals (Brown and Ortega, 2005; Huang, 2014; McDonald *et al.*, 2015; Mugwisi and Ocholla, 2003; Perryman, 2008; Sugimoto *et al.*, 2014). They are also fond of using Google (Sorensen and Dahl, 2008).

Information practices

The reviewed papers revealed valuable information on the information practices of librarians. Academic librarians collaborate (Anasi *et al.*, 2014; Belzowski *et al.*, 2013; Brown and Duke, 2005; Chang, 2016, 2017, 2018; Costello and Bosque, 2010; Dabengwa *et al.*, 2019; Eddy and Solomon, 2017; Fourie, 2011, 2012b; Hart, 2000; Jamali, 2018; Magoi *et al.*, 2019; Parrott, 2016; Smith, 2016; Spring *et al.*, 2016) and socialise (Kaatrakoski and Lahikainen, 2016; Lee *et al.*, 2016; Spring *et al.*, 2016). Their information practices are shaped by norms (Adebayo and Mabawonku, 2017; Ferguson *et al.*, 2016) and attitudes (Aharony, 2009; Hansson and Johannesson, 2013; Moniarou-Papaconstantinou and Triantafyllou, 2015). Several papers report on their information literacy practices (Anyaoku *et al.*, 2015; Bewick and Corrall, 2010; Brown and Duke, 2005; Carroll and Klipfel, 2019; Delaney *et al.*, 2020; Fourie, 2013; Hess, 2015; Hook *et al.*, 2003; Julien and Genuis, 2011; Julien and Given, 2002; Julien and Pecoskie, 2009; Kim and Sin, 2016; Miller and Minkin,

2016; Snavely and Dewald, 2011; Sundin *et al.*, 2008; Tewell, 2018). Doing research is also part of their work related practices (Bhardwaj, 2017; Chang, 2016, 2017, 2018; Dees, 2015; Hart, 2000; Jamali, 2018; Lyon *et al.*, 2016; Powell *et al.*, 2002; Schrader *et al.*, 2012; Shao *et al.*, 2018; Sugimoto *et al.*, 2014; Sullivan *et al.*, 2013; Watson-Boone, 2000).

Information activities linked to knowledge and skills development

One of the main aims of this review is to determine how academic librarians obtain knowledge and skills. It is believed that learning and skills development takes place in daily practices in the workplace, of which the majority are informal and unintended (Aharony *et al.*, 2017; Bruce *et al.*, 2017; Forster, 2017; Lloyd, 2006, 2010, 2011a, 2011b). To determine what is reported on academic librarians' information learning practices, papers related to learning and skills development were thematically analysed. Figure 5 provides a list of these themes, with the number of papers referring to the specific activity.
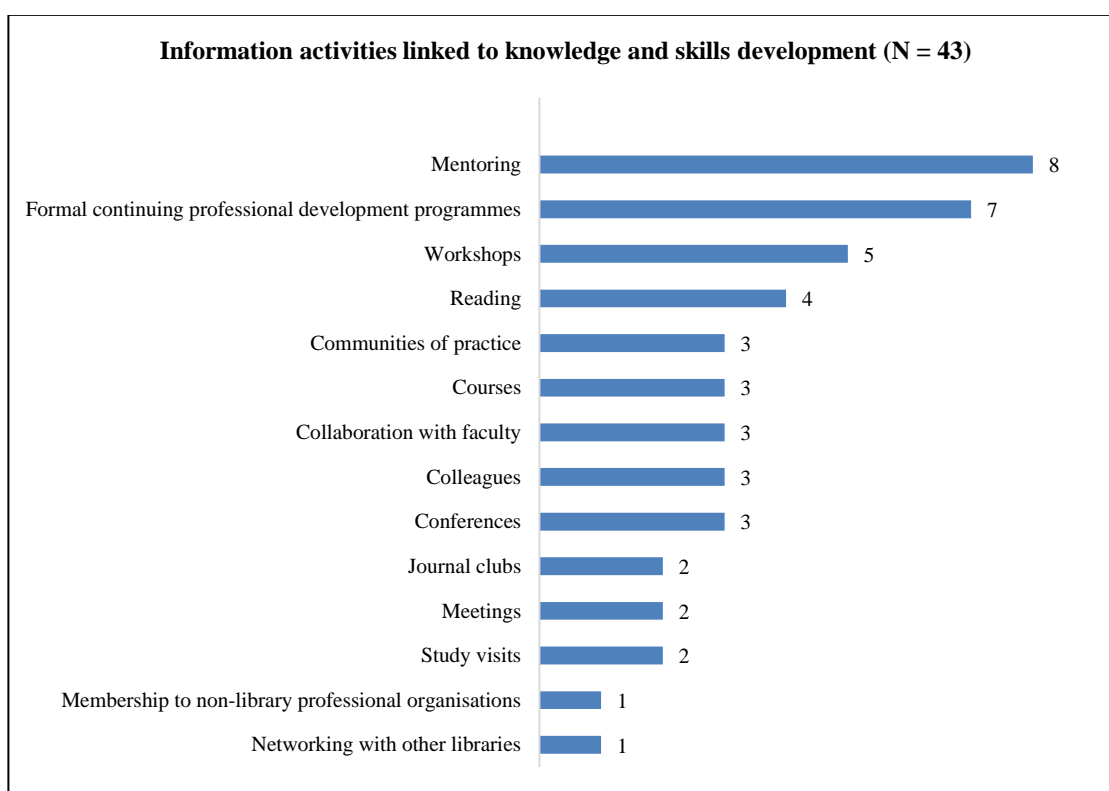

Figure 5: Information activity investigated (N = 43)

The majority of authors report on formal (intended) activities, such as mentoring (Bello and Mansor, 2013; Fiegen, 2002; Fyn, 2013; James *et al.*, 2015; Jordan, 2019; Lee *et al.*, 2016; Lorenzetti and Powelson, 2015; Mallon, 2014) and formal continuing professional development (CPD) programmes (Bello and Mansor, 2013; Bennett, 2011; Bewick and Corrall, 2010; Brantley *et al.*, 2017; Chan and Auster, 2003; Cox *et al.*, 2012; Hess, 2015). Some report on workshops (Booth and Brice, 2003; Delaney *et al.*, 2020; Hook *et al.*, 2003; Julien and Genuis, 2011; Ntui and Inyang, 2015) and reading (Hanz and McKinnon, 2018; Julien and Genuis, 2011; Perryman, 2008; Pilerot and Lindberg, 2018). There are three references to conferences (Lyons, 2007; Perryman, 2008; Pilerot and Lindberg, 2018) and communities of practice (Belzowski *et al.*, 2013; Clifton *et al.*, 2017; Smith, 2016). Other activities include courses (Brantley *et al.*, 2017; Cox *et al.*, 2012; Decker, 2017), collaboration with faculty (Belzowski *et al.*, 2013; Brown and Duke, 2005; Julien and Given, 2002), colleagues (Eddy and Solomon, 2017; Hart, 2000; Pilerot and Lindberg, 2018), journal clubs (Barsky, 2009; Pilerot and Lindberg, 2018), participation in meetings (Keisling and Laning, 2016; Pilerot and Lindberg, 2018)

and study visits (Bennett, 2011; Scherlen *et al.*, 2009). Membership to non-library professional organisations (Bennett, 2011), and networking with librarians in other libraries (Smith, 2016) are other activities identified in the studies.

Discussion

This review scoped 126 papers to develop insight into the information behaviour and information practices of academic librarians.

Studies were spread over 51 journal titles, with the majority papers published in the *Journal of Academic Librarianship*. Researchers from the United States contributed more than half of these publications.

Studies followed qualitative, quantitative or mixed methods with the majority reporting on the utilisation of traditional methods, such as questionnaires and interviews, although a few endeavoured more innovative methods, such as the use of personal logbooks, card sorting and researcher-as-participant self-reflection. It would be worth exploring data collection methods other than questionnaires or interviews (where participants are reporting from their viewpoint), to see what results could be brought forward by looking from different perspectives (e.g., observations, photo ethnographic).

The majority of research report on practical challenges of librarians, with only a few referring to specific theoretical roots. This tendency confirms opinions by several researchers who are concerned with the difficulties in integrating theory to practice (Hider *et al.*, 2019; Nguyen and Hider, 2018). This phenomenon may be a topic for future research.

The aim of this review was to learn more on the information behaviour and information practices of academic librarians. It is generally accepted that information behaviour is determined by, and takes place within, specific situations, contexts and in varied roles of people's everyday lives (Savolainen, 2017). This scoping review indicated that context and work roles might define the information behaviour of librarians. Some findings, for example, show that health information specialists have similar information behaviour as the professionals they serve (Booth and Brice, 2003; Butler, 2019; Carlyle, 2008; Scherrer and Jacobson, 2002), while there are clear differences between the information seeking behaviour of physical science librarians and that of their users (Perryman, 2008). Most often, academic librarians will start their searches in library catalogues rather than commercial or free websites (as is the case with most library users) (McDonald *et al.*, 2015), although they do use Google too (Sorensen and Dahl, 2008). They are also purposeful users of scholarly journals and e-books (Hanz and McKinnon, 2018; Perryman, 2008). They do thus use the sources they acquire, manage and promote as part of their work. This links to the concept *community of justification*, which refers to the tendency of a person to make use of the tools at hand within which he or she acts (Sundin and Johannisson, 2005; Sundin *et al.*, 2008). This theory is also supported by findings of studies indicating that librarians conform to ethical practices (which they promote to users) in their own use of information (Ferguson *et al.*, 2016). In line with their academic work environment, they are also doing research (Powell *et al.*, 2002; Shao *et al.*, 2018; Watson-Boone, 2000) and teach (Julien and Pecoskie, 2009). This can be further explained by the theory of *symbolic interactionism*, which rests on the notion that roles and identities are constructed and evolve through social interaction (Julien and Pecoskie, 2009), in this case with faculty at their institutions.

To address their information needs, librarians often prefer to use less formal information resources. Findings indicate preferences towards personal communication (e.g., electronic mail, face-to-face meetings), social media and other Web 2.0 tools, such as wiki's and blogs (Aharony, 2009; Ahenkorah-Marfo and Akussah, 2016; Costello and Bosque, 2010; Magoi *et al.*, 2019; Quadri and Adebayo Idowu, 2016).

Librarians are willing to learn and understand the importance of skills development. They therefore deliberately engage into formal programmes to improve themselves or their colleagues. A large number of authors report on mentoring to broaden skills and professional development of librarians (Bello and Mansor, 2013; Fiegen, 2002; Jordan, 2019; Lorenzetti and Powelson, 2015; Neyer and Yelinek, 2011). Mentoring, became an established practice in academic libraries, with a variety of such programs presented, ranging from formal one-on-one pairings to mentoring groups (Fyn, 2013). Librarians also read to stay updated (Bhardwaj, 2017; Perryman, 2008; Pilerot and Lindberg, 2018). Other formal learning opportunities include attendance of conferences, courses, study visits and workshops, as well as journal clubs, and membership to non-library professional organisations.

A few authors mention engaging in communities of practice for information sharing and learning (Belzowski *et al.*, 2013; Clifton *et al.*, 2017; Miller and Minkin, 2016). The community of practice concept refers to a group of individuals who share a common practice, with learning embedded in the community, marginalising the possibility of knowledge transfer either inwards or outwards (Lave and Wenger, 1999; Wenger, 1999). Several authors view communities of practice to be significant sites of learning, innovation and creativity in workplaces (Brown and Duguid, 2000; Talja, 2002; Vega and Quijano, 2010).

Collaboration and socialisation is part of librarians' daily activities – this is how they address their information needs and learn to do new things (Belzowski *et al.*, 2013; Corrall, 2014; Fourie, 2012b). In this regard, the reviewed literature provide various views on more informal ways of learning in the workplace. Librarians particularly learn by doing things together with their colleagues, participating in meetings, collaborating with faculty and socialising and networking with librarians from other libraries (Pilerot and Lindberg, 2018). This links to arguments by several authors (including Bruce *et al.*, 2017; Forster, 2017; Lloyd, 2011a) that learning and knowledge transfer in the workplace is most of the time unintentional and function as part of day-to-day work life. They agree that information skills cannot be taught independently of the knowledge domains, organizations, and practical tasks in which these skills are used (Tuominen *et al.*, 2005).

The scoping review provided useful insight into the information behaviour and information practices of academic librarians. Yet, there are gaps, which can be addressed by further research. A study comparing the information behaviour and information practices of academic librarians as it relates to different tasks and roles may provide even deeper insight into the different contexts of the work of librarians. This, for example may assist library management with strategic decisions, such as finding ways to enhance innovation from within teams (Ahmad *et al.*, 2019; Gross, 2017) or the effective implementation of technology in work spaces (Lee, 2018; Papagiannidis and Marikyan, 2019). It may further add to the theoretical knowledge on tasks in information research contexts, as there are limited reference to this, except from Koltay (2016) and McDonald *et al.* (2015), who found that patterns in librarians' information behaviour at work and leisure are influenced by contextual variables, personal preferences and tasks. It would also be meaningful to investigate information practices of different functional groups in libraries.

Several papers discuss the use and application of information communication technology in librarian's work and information activities (Ajegbomogun and Busayo, 2011; Ejedafiru and Lucky, 2013; Hoskins, 2005; Talab and Masoumeh, 2012). Yet some found that librarians need more training in information technology skills (Haneefa and Shukkoor, 2010; Ntui and Inyang, 2015). They also need training to prepare them for their work in information-rich environments and to participate as peers in problem solving, as well as to excel in teaching   (Miller and Minkin, 2016). The work environment of academic librarians is technology driven, and it is expected from the library to drive innovation and to introduce new technology to the university community (Chaithra and Pai, 2018; Walwyn and Cloete, 2016), yet, several studies indicate a lack of essential skills to drive technology. Future research aiming to better understanding these needs might assist in identifying learning initiatives to enhance innovation and developing high-level technology skills.

Conclusion

The intention of this review was to get an overview of the scope of evidence on the information behaviour and information practices of academic librarians. The 126 selected papers provided valuable insight into these information activities as well as how it link to knowledge and skills development in their workplace.

In addition, this review identified opportunities for future research. With only a few studies based on theoretical frameworks, and a strong tendency towards practice-led research, the need for more integration and collaboration between theory and practice exists. Future research may also focus on task-based information practices as well as linking information practice research to innovation and technology.

The scoping review methodology succeeded in providing an overview of the nature of studies on the topic, while enough evidence was obtain to address the research questions and identifying opportunities for further investigation.

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