

Contents

Editorial

- Developments and trends for 2021 3
Steven W. Witt

Articles

- Sources of climate change information used by newspaper journalists in Tanzania 5
Peter Onauphoo Siyao and Alfred Said Sife
- Information-seeking behaviour of science and technology researchers in Nigeria: A survey of the Federal Institute of Industrial Research Oshodi 20
Olayinka Babayemi Makinde, Glenrose Velile Jiyane and Tinashe Mugwisi
- Business intelligence in academic libraries in Jordan: Opportunities and challenges 37
Faten Hamad, Razan Al-Aamr, Sinaria Abdel Jabbar and Hussam Fakhuri
- Research data management in Turkey: A survey to build an effective national data repository 51
Guleda Dogan, Zehra Taskin and Arsev Umur Aydinoglu
- Analysis of the alliance of archives, libraries, and museums of South Africa National Parks: Kruger National Park 65
Nkholezzeni Sidney Netshakhuma
- Copyright literacy of library and information science professionals in Bangladesh 78
Zakir Hossain
- Students' attitudes towards library overdue fines in an academic library: A study in a private university setting in Bangladesh 91
Sangita Basak and Shamima Yesmin

- Abstracts** 101

Aims and Scope

IFLA Journal is an international journal publishing peer reviewed articles on library and information services and the social, political and economic issues that impact access to information through libraries. The Journal publishes research, case studies and essays that reflect the broad spectrum of the profession internationally. To submit an article to IFLA Journal please visit: journals.sagepub.com/home/ifl

IFLA Journal

Official Journal of the International Federation of Library Associations and Institutions
ISSN 0340-0352 [print] 1745-2651 [online]

Published 4 times a year in March, June, October and December

Editor

Steve Witt, University of Illinois at Urbana-Champaign, 321 Main Library,
MC – 522 1408 W. Gregory Drive, Urbana, IL, USA. Email: switt@illinois.edu

Editorial Committee

Sanjay Kumar Bihani (IFLA Governing Board Liaison),
Library and Information Officer Ministry of External Affairs, India.

Amanda Cossham, (*At Large*)
Open Polytechnic, New Zealand. Email: amanda.cossham@openpolytechnic.ac.nz

Milena Dobрева-McPherson,
University College London Qatar, Qatar. Email: milena.dobрева@gmail.com

Amany M. Elsayed, (*Africa Representative*)
Helwan University, Egypt. Email: amany03@gmail.com

Anthi Katsirikou,
Director, University of Piraeus Library Adjunct Professor, Open University of Greece. Email: anthi@asmda.com

Mahmood Khosrowjerdi,
Allameh Tabataba'i University, Tehran, Iran. Email: mkhosro@gmail.com/mkhosro@atu.ac.ir

Debbie Rabina,
Pratt Institute, USA. Email: drabina@pratt.edu

Egbert J. Sanchez-Vanderkast (Latin America and Caribbean Representative),
Instituto de Investigaciones Bibliotecológicas y de la Información, Universidad Nacional Autónoma de México, Mexico.

Diljit Singh, (*Asia Oceania Representative*)
University of Malaya (retired), Kuala Lumpur, Malaysia. Email: diljit.singh.dr@gmail.com

Shali Zhang, (*Chair*)
Auburn University, USA. Email: shali.zhang@auburn.edu

Lihong Zhou,
Wuhan University, China. Email: 00030118@whu.edu.cn

Publisher

SAGE, Los Angeles, London, New Delhi, Singapore, Washington DC and Melbourne.

Copyright © 2021 International Federation of Library Associations and Institutions. UK: Apart from fair dealing for the purposes of research or private study, or criticism or review, and only as permitted under the Copyright, Designs and Patents Acts 1988, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers, or in the case of reprographic reproduction, in accordance with the terms of licences issued by the Copyright Licensing Agency (www.cla.co.uk/). US: Authorization to photocopy journal material may be obtained directly from SAGE Publications or through a licence from the Copyright Clearance Center, Inc. (www.copyright.com/). Inquiries concerning reproduction outside those terms should be sent to SAGE.

Annual subscription (4 issues, 2021) Free to IFLA members. Non-members: full rate (includes electronic version) €339/\$625. Prices include postage. Full rate subscriptions include the right for members of the subscribing institution to access the electronic content of the journal at no extra charge from SAGE. The content can be accessed online through a number of electronic journal intermediaries, who may charge for access. Free e-mail alerts of contents listings are also available. For full details visit the SAGE website: sagepublishing.com

Student discounts, single issue rates and advertising details are available from SAGE, 1 Oliver's Yard, 55 City Road, London EC1Y 1SP, UK. Tel: +44 (0) 20 7324 8500; e-mail: subscriptions@sagepub.co.uk; website: sagepublishing.com. In North America from SAGE Publications, PO Box 5096, Thousand Oaks, CA 91359, USA.

Please visit journals.sagepub.com/home/ifl and click on More about this journal, then Abstracting/indexing, to view a full list of databases in which this journal is indexed.

Printed on acid-free paper by Henry Ling Limited, Dorchester, UK.



Developments and trends for 2021

Steven W. Witt

International Federation of
Library Associations and Institutions
2021, Vol. 47(1) 3–4
© The Author(s) 2021
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/03400352211005128
journals.sagepub.com/home/iff



The year 2020 marked a difficult period for libraries around the world as we collectively sought to respond to the extreme challenge of the COVID-19 global pandemic. With hopes that the coming year would bring change and enable some return to normalcy, many of us celebrated the coming of 2021 while reserving energy for what is likely to be another difficult year. For 2021, IFLA Journal will continue to publish original research from a diverse body of LIS professionals and scholars. The editorial committee welcomes your submissions and looks forward to further ideas for special issues that provide a valuable contribution to research while ensuring that the journal reflects the ambitious work of IFLA and its sections. Forthcoming in 2021 will be a special issue on innovative responses to the COVID-19 pandemic and one on indigenous librarianship. In addition, we are working towards issues focused on two of IFLA's strategic programs: Preservation and Conservation, and Freedom of Access to Information and Freedom of Expression.

Led by journal editorial board member, Milena Dobrava, a distinguished group of guest editors from four regions of the world are working on an ambitious issue this will explore the adaptation and transformation of the library sectors during the COVID-19 pandemic. As we have each experienced individually, the outbreak imposed sudden closures that forced the library sectors to find new ways to operate during times of confinement and social distancing. These responses ranged from adopting coping strategies to embracing innovation: existing digital services were expanded, and traditional in-person services had to be migrated online, galvanizing the institutional planning for digital transformation. Planning for reopening – which is ongoing for many organizations – has been particularly challenging as the pandemic and virus continues to evolve. This special issue aims to explore the nature of the ongoing change and transformation and to support library professionals in charting their institutions' post-COVID19 strategic planning. Having received 50 manuscript submissions from nineteen countries, this issue will provide an

important initial view of the pandemic and its impacts as an object of scholarship and discussion, continuing to advance our understanding of how libraries respond to crises (Witt & Smith, 2019).

Scheduled for issue 3 of 2021, the special issue on Indigenous Librarianship is being led by colleagues in the IFLA Indigenous Matters section. This issue is focused on theory and practice in indigenous librarianship. With the potential to transform lives and societies, the issue calls our attention to the importance of indigenous librarianship, indigenous ways of research and education, and indigenous languages. As noted in the call for papers, “our understandings of Indigenous librarianship come from across the globe and ranges widely in focus from practice-based work to highly theoretical research; from everyday community life to education and workplace settings; and for children through to the Elders”. Papers from this issue will build upon IFLA Journal's long commitment to publishing important work on both indigenous knowledge and cultural preservation. This includes Nakata's widely cited and read “Indigenous Knowledge and the Cultural Interface: underlying issues at the intersection of knowledge and information systems” (2002), Sraaku-Lartey et. al.'s more recent analysis of the use of indigenous knowledge for the contemporary management of forest resources (2017), and Roy's important review essay on indigenous cultural heritage preservation (2015). This special issue continues and expands upon this important dialogue.

The special issues focused on preservation and freedom of access allow IFLA journal to contribute important work to two areas at the core of the work of libraries. Working with IFLA's Preservation and Conservation Section and the PAC Centers, this preservation issue is “focused on storage as a strategic long-term function of libraries, including practices for physical and digital collections based on risk, value, and cost in terms of institutional mission and resources”. In addition to focusing on an important topic, this issue will also the journal to experiment with the type of content it publishes, adding a supplemental call for shorter case study reports from the

field to further represent the breadth of issues that concern IFLA's diverse global audience.

Working with the IFLA Freedom of Access to Information and Freedom of Expression (FAIFE) advisory committee, the journal is also soliciting ideas for an innovative approach to exploring the evolution of our profession's conceptions of access as they have developed since the publication of the IFLA Statement on Libraries and Intellectual Freedom twenty years ago. This issue will publish new and original research, case studies, and essays that will a) examine the impact the Statement on libraries and intellectual freedom has had on the library profession over the past twenty years, and/or b) examine the impact of the past twenty years on the Statement. Like the special issue on preservation, the journal is taking a slightly different editorial approach, first soliciting abstracts to enable the issue editors to focus the issue closely on the topic and also allow potential authors to receive important initial feedback on their work as it moves toward full double-blind review. This will hopefully, allow the editorial process to provide better mentorship throughout the development of papers.

In addition to allowing the journal to better integrate its work into the professional committee and goals of IFLA as an organization, these special issues provide the journal with a valuable opportunity to reflect further on content, process, and its relationship with a diverse collective of authors and reviewers that

work in tandem to produce important scholarship that is both reflective of the field but also advancing our practices and base of knowledge. Like the journal's aims to reduce bias in the review process and provide important professional development opportunities to potential authors, the Editor and Editorial Board hope that adjustments to content and process enable us to improve the journal – not through an emphasis on chasing impact factors but rather by ensuring that opportunities to research and publish scholarship in the field of LIS are available to an increasingly larger group of colleagues (Witt, 2019).

References

- Nakata M (2002) 'Indigenous Knowledge and the Cultural Interface: underlying issues at the intersection of knowledge and information systems', *IFLA Journal*, 28, 5-6, pp. 281–91.
- Roy L (2015) 'Indigenous cultural heritage preservation: A review essay with ideas for the future', *IFLA Journal*, 41(3), pp. 192–203. doi: 10.1177/0340035215597236.
- Sraku-Lartey M, et al. (2017) 'Digitization of indigenous knowledge on forest foods and medicines', *IFLA Journal*, 43(2), pp. 187–197. doi: 10.1177/0340035216681326.
- Witt S (2019) 'Can journals overcome bias and make the peer review process more inclusive?', *IFLA Journal*, 45(4), pp. 275–276. doi: 10.1177/0340035219894100.
- Witt S and Smith K (2019) 'Libraries in times of crisis', *IFLA Journal*, 45(1), pp. 3–4. doi: 10.1177/0340035219830549.



Sources of climate change information used by newspaper journalists in Tanzania

International Federation of
Library Associations and Institutions
2021, Vol. 47(1) 5–19
© The Author(s) 2021
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0340035220985163
journals.sagepub.com/home/iff



Peter Onauphoo Siyao

Department of Library Science and Information Management, Directorate of Library and Technical Services, Mzumbe University, Tanzania

Alfred Said Sife

Department of Knowledge Management, Directorate of Co-operative Library and Archives, Moshi Cooperative University, Tanzania

Abstract

This article assesses the information sources used by Tanzanian newspaper journalists to collect climate change information. The main sources of climate change information consulted by newspaper journalists in Tanzania are climate change experts and daily events, such as community meetings and other relevant social gatherings. These sources are interactive – enabling journalists to obtain climate change information – and easily accessible, and use and provide instant responses. It was also found that deficient use of other potential sources of information, such as libraries, printed materials and Internet websites, coupled with overarching challenges that limit newspaper journalists from seeking, covering and reporting information on climate change, may affect the quality and quantity of climate change information published in Tanzanian newspapers. All the stakeholders involved in the fight against climate change and journalism colleges should collaborate and devise strategies aimed at building the capacity of newspaper journalists, editors and reporters in their daily activities.

Keywords

Information sources, climate change information, journalists, newspapers, Tanzania

Introduction

Climate change is one of the most pressing global environmental problems caused by natural and anthropogenic factors (Gadzekpo et al., 2018; Lund, 2019). Although all countries experience the challenges caused by climate change, developing countries such as Tanzania are the most negatively impacted because the majority of their population depends on climate-sensitive natural resources and they have low adaptive capacities (Intergovernmental Panel on Climate Change, 2007; Ludwig et al., 2007). The negative impacts of climate change include erratic and unreliable rainfalls, extreme temperatures, droughts, floods, low food production, the death of animals and land degradation (United Republic of Tanzania, 2012).

The acquisition and use of information about climate change is necessary for assessing the impacts of climate change on human and natural systems, and in planning for climate change adaptation, coping and

mitigation strategies (Giorgil et al., 2009). Access to reliable, timely and up-to-date information on climate change is also necessary for raising public awareness about the impacts of climate change, as well as for better management of climate-change-related risks (Debela et al., 2015; Dinshaw et al., 2012). It is also necessary for understanding the scope of climate change, as well as its impact on socio-economic and environmental stability (Corner, 2011; Jiyane and Fairer-Wessels, 2012). Climate change is an unobtrusive and complex issue, which most people must learn about from communication media such as newspapers, television and radio (Arlt et al., 2011; Boykoff, 2011; Schäfer and Schlichting, 2014).

Corresponding author:

Peter Onauphoo Siyao, Mzumbe University, Magorofani Street, P.O Box 4, Mzumbe, Morogoro, Tanzania.
Email: posiyao@mzumbe.ac.tz

The Tanzanian media industry consists of several newspapers and television and radio stations, which operate under a legal framework that requires registration for compliance. As such, there has been a fluctuation in the number of registered newspapers and television and radio stations. A 2015 report by the Ministry of Information, Culture, Arts and Sports Statistics indicated that the number of registered newspaper was 39 (United Republic of Tanzania, 2016). According to Bazira et al. (2019), in October 2017 there were 109 registered newspapers, where 85 were relicensed to continue with operations while the other 24 were newly licensed.

Newspapers can play a crucial role in disseminating information on climate change to their target audiences, which, in turn, contributes to their ability to adapt, cope and mitigate climate change conditions. The effectiveness of newspapers in the dissemination of information depends on, among other factors, the ability of journalists to collect information from authentic sources. Hence, a journalist is a person who plays an active role in the process of collecting, analysing and reporting facts accurately and in a timely manner for public consumption (Boykoff and Roberts, 2007; Ochieng, 2009; Tagbo, 2010). In order to get relevant information on climate change for their own consumption and dissemination, newspaper journalists are expected to identify, choose and use the most reliable and convenient sources of information (Ansari and Zuberi, 2012; Hossain and Islam, 2012; Takahashi et al., 2016). Sources of information can be people, letters, books, files, films or tapes – in fact, anything which journalists use to put news stories together (Ingram and Estate, 2008). Freeman (2016) adds that sources of information are important elements in shaping coverage patterns in communication media such as newspapers. Such information sources are expected to be relevant, timely, accurate, accessible, cost-effective, reliable, usable and exhaustive (Das, 2012; Statrasts, 2004).

In this respect, journalists serve as a bridge between the sources and consumers of climate change information. Since journalists are always interested in presenting stories that are current, relevant and interesting to readers (Irwansyah, 2016), they should be familiar with authentic sources and use them to meet their information needs (Ansari and Zuberi, 2012; Mahajan and Kumar, 2017; Watson and Cavanah, 2015). Journalists should use multiple sources of information when covering and reporting information on climate change in order to get diverse points of view, strengthen their stories and make them authentic (Lulagambi et al., 2011; Nicholaus and Martin, 1997). However, care should be taken, as sometimes

diverse sources may generate contradicting information (Zakar, 2005). For example, to avoid the dissemination of misleading information, information from the contrarians or deniers of climate change cannot be combined with information from those who advocate that climate change is real. Thus, it is important for newspaper journalists to select and use non-contradicting climate change information sources or make a thorough synthesis of information from diverse sources.

The ability to select and use various sources of information depends on factors such as the amount of time and effort required to locate, contact and interact with such sources (Wilson, 1997). The different kinds of effort or costs involved when using information sources include physical effort, which is needed to travel to the sources; intellectual effort in evaluating the sources; and psychological effort, which is needed to deal with the quality of the sources. At the cognitive level, an individual selects sources that they consider to be the most accessible and likely to provide relevant, usable and helpful information (Choo, 2001). Other influencing factors include a person's socio-economic background, social capital, economic resources, affordability of the information, information-seeking behaviours, existing knowledge of the issue, information needs and purpose of using the information (Lim, 2010; Zakar, 2005).

Literature review

News media are fundamental sources of information on climate change. Depending on the level of the information infrastructure, people use different sources to gather information on climate change. Studies have found that television, newspapers, radio and Internet websites are the primary sources of information in the most developed countries (Kohut et al., 2012). A study by Luganda (2005) revealed that radio has been a primary channel through which climate change news is communicated in the least developed countries, particularly in rural areas.

There are various studies on the information sources used by journalists for news-making, and the challenges they encounter when using such sources. Potteet (2000) conducted research on the use of online sources and the influence of attitude on use patterns among American newspaper journalists. The findings reveal that all the surveyed journalists used the Internet. These journalists learnt about the existence of online information sources from their colleagues. They used these sources for background information, fact-finding, reading other news media and identifying other sources of information.

Anwar et al. (2004) conducted an in-depth study based on quantitative data collected by a questionnaire to examine the information-source preferences of 92 Kuwaiti newspaper journalists, their level of satisfaction with the sources used, their use of electronic resources, their level of information-use skills, and problems they faced while seeking information. The results indicate that the journalists used information sources for fact-checking and background information. Both informal and formal sources of information were used, and the Internet was highly ranked as the main source of information. With regard to the problems faced, the study found that the information-searching skills of the print media journalists in Kuwait were lacking, and they thus would have a dire need for training if it were provided.

Ansari and Zuberi (2012) carried out a study on the use of various information channels, the awareness of the existence of information sources, ways used for disseminating information and the use of libraries among mass-media professionals in Karachi, Pakistan. The findings indicate that print sources such as research reports, encyclopaedias, journals and annual reports were mostly used for seeking factual information. Because of time constraints, the journalists sought selective information.

Mahapatra and Panda's (2001) study on the state of the information-seeking and information-searching behaviour of working journalists in Orissa indicated that journalists gave first priority to current periodicals, seminars or conference proceedings, and newspapers. This study also found that journalists experienced time constraints, as they did not find time to read or look for information, the library was not automated, there were inadequate reference and referral services, and reading materials were poorly organized. Earlier, Mahalik (1998) indicated that journalists visited their parent library system to acquire information. However, most of the newspaper organizations did not possess a library and these journalists also lacked the time to read or look for information.

Singh and Sharma (2013) conducted a study on the information-seeking behaviour of newspaper journalists in Delhi, India, which aimed to identify the types of information sources consulted by various categories of journalists and the various difficulties encountered by different categories of journalists in their information-seeking activities. It was found that the journalists most frequently used periodicals, news magazines, current issues of newspapers, newspaper-clipping files and dictionaries or biographical dictionaries as sources for the purpose of seeking specific information. The main difficulties faced by the

journalists were the lack of modern communication gadgets, information scattered in many sources, the lack of time to look for or read information, information not being readily available, and inadequate library services and sources. Similar challenges were also reported by Doddamani and Naik (2018).

Hossain and Islam (2012) reported that the main problems encountered by most of the journalists in their study were the lack of sufficient time to seek information, lack of training, the information explosion and lack of cooperation from library staff. Nicholas and Martin (1997) reported that journalists faced the challenge of a lack of time, inadequate resources, and lack of training in information sources such as libraries, databases and the Internet.

Amu and Agwu (2012) conducted a study to examine print media journalists' attitudes towards coverage of climate change news in Nigeria. Specifically, the study sought to identify journalists' information sources about climate change. In this study, it was revealed that a greater proportion of the respondents perceived the Internet as the most important information source, followed by government sources such as the Ministry of Environment, scientific journals, newspapers and television. One of the challenges faced by these journalists was a lack of training in the coverage of climate change news, and this probably resulted in their lack of interest in reporting climate change stories.

In Kenya, Sasaka et al. (2017) reported that media professionals preferred official records, past publications, past broadcasts and government officials as sources of information. It was further reported that media professionals were not adequately skilled in the electronic information-search-and-retrieval environment. A study by Elia (2019c) indicates that conferences and researchers were the information sources mostly consulted by the general category of journalists in Tanzania when accessing climate change information. It was also found that the key challenges faced by these journalists when accessing and using climate change information were journalists' insufficient analytical skills, lack of coordination, language barrier, poor reading culture, inadequate training and insufficient information-searching skills.

Despite the fact that newspaper journalists play an important role in making climate change information accessible, in Tanzania little is known about the information sources used by newspaper journalists to extract such information. The little knowledge of the sources from which newspaper journalists extract climate change information leads to the low coverage of this kind of information in Tanzanian newspapers, which, in turn, impedes its

dissemination (Siyao and Sife, 2018). There is also a scarcity of scientific literature on the challenges encountered by newspaper journalists when covering climate change information in Tanzania. The little literature that is available is mostly on the coverage of climate change information in Tanzanian newspapers and the challenges encountered by the general category of journalists when covering information in their media (Elia, 2019a, 2019b, 2019c; Siyao and Sife, 2018; Tairo, 2013). Knowledge of such sources helps the generators of climate change information to know the reliable and accessible channels through which they can direct this information for further dissemination. This, in turn, improves communication of climate change information from the sources to the media and from the media to the general public. This study therefore assessed the sources of climate change information used by newspaper journalists and examined the challenges encountered when covering such information.

Research questions

The study was guided by the following research questions:

1. What sources of climate change information are frequently used by newspaper journalists?
2. What are the challenges encountered by newspaper journalists when covering information on climate change in Tanzania?

Methodology

This study employed a cross-sectional research design, which enables data to be collected at a single point in time. Both quantitative and qualitative approaches were used as data collection methods. This article is part of a wider study focusing on the role played by newspapers in the dissemination of climate change information in Tanzania, which started in 2015 and had a population of 39 newspapers that had full registration. For consistency, the present article used the same population of 39 newspapers. A purposive sampling technique based on inclusion and exclusion criteria was employed to guide the selection of newspapers for this study. The inclusion criteria were their nationwide coverage and diversity of news, accessibility, consistency in publishing issues, ownership type, language used and frequency of publication (see Table 1). The excluded newspapers were those which focus largely on politics, religion and sensational issues. Newspapers that lack nationwide coverage and diversity of news and are published in

languages other than Kiswahili or English were also excluded. A purposive sampling technique and the inclusion criteria led to the selection of 10 newspapers – namely, *Daily News*, *The Guardian*, *Habari Leo*, *Mwananchi*, *Rai*, *Nipashe*, *Majira*, *Mtanzania*, *Business Times* and *This Day*.

The sampling frame included all newspaper journalists who write about climate change matters drawn from the 10 selected newspapers' media houses. A total of 51 names of journalists who write about climate change was obtained from the 10 newspapers' media houses, and 30 newspaper journalists were randomly selected for the study. A sample size of 30 or more is believed to result in a sampling distribution that is very close to the normal distribution (Saunders et al., 2007). To obtain the number of journalists from each newspaper's media house, probability proportional to size sampling was used (see Table 2).

Furthermore, four journalists were purposively selected from the Journalists Environmental Association of Tanzania. Members of the Association include experienced and veteran journalists who cover and report on climate change issues in newspapers. A purposive sampling technique was also used to select 10 editors – one editor was chosen from each of the selected newspapers. The selection of newspaper editors was with the aim of obtaining information from different media professionals. The final sample size was 44 newspaper journalists and editors. Similar studies (Anwar et al., 2004; Attfield and Dowell, 2003) have a higher or lower sample size.

The data was collected between March and July 2018 using structured questionnaires and applying a drop-off/pick-up design method. The structured questionnaires for the journalists and editors were written in both English and Kiswahili to give them the freedom of responding through the language of their choice (see Supplementary Material online). Qualitative data was obtained from five key informants, comprising the chairperson of the Journalists Environmental Association of Tanzania, senior journalists and chief editors. The quantitative data was analysed based on descriptive statistics. The qualitative data was subjected to content analysis, whereby the key informant interviews were recorded and transcribed into practical themes by the researcher for discussion. Phrases and issues that commonly recurred during the discussions were sorted to establish themes that captured something important about the data in relation to the research objectives (see Braun and Clarke, 2006).

Table 1. Selected newspapers.

Newspaper	Circulation per day	Publisher	Selection criteria					
			Ownership		Language		Frequency of publication	
			Government	Private	Kiswahili	English	Daily	Weekly
<i>Business Times</i>	15,000	Business Times Limited		x		x		x
<i>Daily News</i>	50,000	Tanzania Standard Newspapers	x			x	x	
<i>The Guardian</i>	20,000	IPP Media		x		x	x	
<i>Habari Leo</i>	40,000	Tanzania Standard Newspapers	x		x		x	
<i>Majira</i>	10,000	Business Times Limited		x	x		x	
<i>Mtanzania</i>	15,000	New Habari Corporation		x	x		x	
<i>Mwananchi</i>	40,000	Mwananchi Communication Limited		x	x		x	
<i>Nipashe</i>	15,000	IPP Media		x	x		x	
<i>Rai</i>	1000	New Habari Corporation		x	x			x
<i>This Day</i>	4000	IPP Media/Media Solutions		x		x		x
Total			2	8	6	4	7	3

Source: Muthee and Mhando (2006); Media Sustainability Index (2012); Simon and Ryan (2013).

Table 2. Selected newspaper journalists.

Newspaper	Number of journalists	Selected journalists based on probability proportional to size
<i>Business Times</i>	5	3
<i>Daily News</i>	6	4
<i>The Guardian</i>	5	3
<i>Habari Leo</i>	6	4
<i>Majira</i>	4	2
<i>Mtanzania</i>	5	3
<i>Mwananchi</i>	7	4
<i>Nipashe</i>	5	3
<i>Rai</i>	4	2
<i>This Day</i>	4	2
Total	51	30

Results and discussion

Demographic profile of the respondents

The study findings show that most (77.3%) of the journalists were male, suggesting that journalism, like many other professions, is male-dominated. Slightly more than a quarter (27.27%) of the journalists were aged between 41 and 45 years, which was followed by those aged between 36 and 40 years (20.45%); the mean age of the respondents was 38 years. With regard to the level of education, one-third (34.1%) of the newspaper journalists had a Bachelor's degree and the rest had diplomas and certificates (see Table 3). These findings demonstrate that these newspaper journalists were within the active labour force

age range and their literacy level was good. Other scholars (e.g. Aoyagi-Usui, 2008; Aoyagi-Usui et al., 2003; Ester et al., 2003) have opined that the extent of understanding climate change issues depends on, among other things, individual characteristics, such as educational level, age, gender and occupation experience. Two-thirds (66%) of the newspaper journalists had work experience of 10 or more years. The majority (72.7%) of the respondents reported that they had covered and reported on climate change issues in their newspapers.

When asked whether or not they had received any formal training on climate change issues, less than half (45%) of the respondents admitted to having attended such training sessions (Table 3). According to Menezes (2018) and Shanahan (2011), training on climate change is necessary because it enhances journalists' ability to identify new sources, content, knowledge and skills with regard to climate change. These findings imply that despite the fact that the newspaper journalists had good level of experience in the field of journalism, they reported on climate change information in their newspapers without having had specialized training – something that may affect the quality of the climate change information published in their newspapers.

Sources of information used by the journalists

The respondents were asked to name and rank the sources of information on climate change they mostly used when searching for and preparing news for their

Table 3. Demographic profile of the respondents.

Category	Frequency	%
Sex		
Male	34	77.3
Female	10	22.7
Age		
25–30	8	18.18
31–35	5	11.36
36–40	9	20.45
41–45	12	27.27
46–50	7	15.90
51–55	3	6.81
Education level		
Certificate	12	27.3
Diploma	17	38.6
Bachelor's degree	15	34.1
Years of work experience		
≤ 9	15	34.0
10–15	24	54.6
16–20	5	11.4

newspapers. The findings in Table 4 indicate the sources of information on climate change used by the newspaper journalists in order of priority.

The findings indicate that 64% of the newspaper journalists consulted climate change experts from government agencies and research institutions such as the Tanzania Meteorological Agency (TMA), the University of Dar es Salaam, Sokoine University of Agriculture, Ardhi University and the Tanzania Forestry Research Institute as sources of information. Climate change experts in these institutions generate information through research activities. A climate change expert is an interpersonal source of information, and this requires one to have the interpersonal skills necessary to source information through interactions. This resonates with Hiles and Hinnant (2014), who posit that climate change is a complex subject that is reported by older and veteran journalists who may have developed interactional knowledge of sourcing information through many years of experience.

The TMA is the agency that is entrusted with the task of collecting, archiving and disseminating climate change and other related information generated by its experts. The agency uses different channels, such as broadcast media, print media, Internet websites and social media, to disseminate such information. The newspaper journalists indicated a high preference for sourcing climate change information from the TMA experts, mainly because this is a government agency, which is likely to provide reliable information. In one of the key informant interviews conducted in Dar es Salaam, a journalist opined:

‘Whenever there are issues about climate change to be communicated to the general public, TMA has the culture of inviting us for news coverage of it in our newspapers’ (Key informant, Dar es Salaam, 17 March 2018). This finding confirms the findings in the studies by Lumosi and McGahey (2016), Ochieng (2009) and Singh et al. (2018), who reported that government agencies such as meteorological agencies play an important role in generating and disseminating information on climate change in their countries. Similarly, Future Climate for Africa (2016) and Chang’a et al. (2010) reported that the TMA is a key source, which provides current information on climate change to the general public and decision-makers in Tanzania.

Climate change experts from research institutions such as the National Carbon Monitoring Centre at Sokoine University of Agriculture, the Institute of Resources Assessment at the University of Dar es Salaam, Ardhi University and the Tanzania Forestry Research Institute were also regarded as important sources of scientific climate change information among the newspaper journalists. The newspaper journalists indicated a high preference for obtaining scientific information from climate change experts from the government agency and research institutions mentioned above because they are particularly engaged in climate research work. Scholars (e.g. Shanahan et al., 2013) suggest that newspaper journalists should contact experts for credible and verifiable climate change facts and predictions. Information verification can promote adaptation by making the climate change agenda more visible through clear frameworks which can be understood by the public. A proper understanding of climate change issues helps journalists to make clear frameworks. Similarly, in one of the key informant interviews, a newspaper journalist indicated his preference for using climate change experts as a source of information:

Although they are very few in number, I prefer seeking information from climate change experts because they are so flexible; they can become resource persons in seminars, conferences and workshops, and I can freely consult them at any time when preparing news for my newspaper. (Key informant, Dar es Salaam, 17 March 2018)

This finding suggests that by attending seminars, conferences and workshops facilitated by experts on matters related to climate change, and by taking the initiative to consult these experts, newspaper journalists can easily and freely obtain scientific knowledge on climate change issues. Seminars, workshops and

Table 4. Sources of information on climate change used by the newspaper journalists.

Sources of information (N = 44)	Usage	
	Frequency	%
Climate change experts from the Tanzania Meteorological Agency and research institutions	28	64.0
Daily events	15	34.1
Radio	11	25.0
Internet websites	10	22.7
Newspapers	9	22.5
Television	9	22.5
Books	6	14.0
Scientific journals	5	11.4
Brochures, magazines, bulletins	2	5.6
Library and information resource centres	1	2.3
Other sources	1	2.3

conferences are short-term training that can expose journalists to more understanding of climate change matters through face-to-face interactions with climate change experts (Ochieng, 2009; UNESCO, 2019; Wihbey and Ward, 2016), promote sources of information, and enhance their effective usage for increasing access to and coverage of climate change information.

About a third (34.10%) of the newspaper journalists indicated that they preferred events such as community meetings and social gathering as sources of information on climate change. Community meetings and other relevant social gatherings provide forums through which information can be easily and quickly shared among community members by talking, asking questions and getting clarification on the questions raised (United Republic of Tanzania, 2012). Community meetings enable newspaper journalists to collect information on how the community uses indigenous knowledge – for example, seasonal weather predictions and adaptations. In Tanzanian context, however, scientific knowledge and indigenous knowledge should complement each other as both have their own strengths and weaknesses (Elia, 2013). Furthermore, the newspaper journalists admitted to having quickly and freely acquired knowledge on various issues of climate change from speeches by politicians, professional groups and other relevant gatherings. This finding is in agreement with those of Chang'a et al. (2010) and Egeru (2016), who reported that community meetings are a participatory approach to information dissemination.

Traditional mass media are important sources used by newspaper journalists for covering and reporting

on the most current information in climate change. According to Gunho (2005), mass-media sources help newspaper journalists to follow what is reported by other journalists in other media outlets, which in turn promotes inter-media agenda-setting. However, the findings of this study indicate that only a quarter (25%) of the newspaper journalists used radio as a source of climate change information, and less than a quarter (22.5%) used television and newspapers. This implies that these traditional electronic media were used less by the newspaper journalists for news-making.

The findings indicate further that less than a quarter (22.7%) of the newspaper journalists used Internet websites as a source of climate change information. This low usage of Internet websites by the newspaper journalists may be associated with technological barriers, particularly with how to use computers to search for information from Internet websites; a low awareness of the important websites where they can locate information about climate change, such as data banks and the official websites and portals of international organizations; and the high cost of Internet service subscriptions (Elia, 2019c; Mansour, 2018; Sharif and Medvecky, 2018; Singh and Sharma, 2013). This finding is in contrast to the reality that Internet websites are possibly the most popular means of online communication. Internet websites can potentially enable newspaper journalists to access and share huge amounts of information on climate change from different sources, thus reducing the cost of searching for, gathering, and sharing current and relevant information (e.g. see Elia, 2019b; Harbinson et al., 2006; Hossain and Islam, 2012; Mahajan and Kumar, 2017). Interesting further discussions with upcountry newspaper journalists indicated that these journalists mostly used Internet services such as email to communicate their news to newsrooms, but did not mostly use Internet services as a search facility for climate change information. Aziz (2014) is of the opinion that the use of Internet websites in Tanzania is inevitable, and it will change journalists' traditional ways of gathering, producing and processing information for further dissemination in the news media.

With regard to printed materials, the findings show that very few of the respondents used brochures, magazines and bulletins (5.6%), scientific journals (11.4%) or books (14%) as sources of information on climate change. The low usage of printed materials may be attributed to a number of factors, including a poor reading culture. It has been reported that many journalists in Tanzania have a poor reading culture (Bazira et al., 2019). Such a culture needs to be cultivated to make it a daily activity, promoting

individuals' lifelong learning skills when they apply critical thinking and problem-solving skills (Wema, 2018). Other factors include the high cost of scholarly publications and the limited budgets of many libraries for buying and subscribing to the relevant printed materials (Lund, 2019). One journalist made the following comments during a personal interview: 'I prefer to cover stories that do not entail much usage of reference materials such as books and journals because such materials may not be available in the libraries for meeting information needs' (Key informant, 15 July 2018). This implies that the high cost of print materials and the limited budgets for libraries impede the availability of relevant reference materials for newspaper journalists in libraries.

The findings indicate that only 2.3% of the respondents used libraries and information resource centres for information on climate change. The low preference of libraries and information resource centres is attributed to the fact that media houses do not have their own libraries and information resource centres. The low preference is also attributed to the poor usage of the available academic and public libraries. Journalists find it difficult to use academic libraries because these libraries are meant for the students, academic staff and other workers in the academic institution. The lack of relevant reading materials is another hindrance to the usage of public libraries by newspaper journalists. In one of the key informant interviews, a newspaper journalist made the following comment: 'Quick use of libraries is not possible because our media houses do not have libraries and information resource centres where we can get reference materials easily' (Key informant, Dar es Salaam, 27 June 2018). This finding is contrary to the studies by Sasaka et al. (2017) and Hossain and Islam (2012), who reported that media libraries and information resource centres are important sources of information and provide both current and retrospective information through current awareness services, the selective dissemination of information, and reference services for journalists. Of the many advantages, the use of libraries such as the Sokoine National Agricultural Library and the University of Dar es Salaam Library may enable newspaper journalists in Tanzania to access information on climate change that is published in newspapers and make this information available to the public. In addition, through using these libraries, newspaper journalists can access the Tanzania Climate Change Information Repository, which provides access to research information on climate change resources generated by the Climate Change Impacts, Adaptation and Mitigation programme and other sources relevant to Tanzania.

Challenges encountered by the journalists

The respondents were provided with a list of challenges encountered when covering climate change information (see Table 5). The overwhelming majority (91%) of the newspaper journalists admitted that abiding by journalistic norms such as the balancing of news impeded them from covering and reporting on climate change issues in their newspapers. Adherence to the balanced norm necessitates that impartial reporting must give approximately equal space to both sides of the climate change story. These norms may sometimes lead to biased coverage of news on climate change by journalists because undue weight may be given to other topical issues raised by the contrarians, amplifying their uncertainties about the causes and risks caused by climate change (Anderson, 2017; Boykoff and Boykoff, 2004; Sunband et al., 2009). Since climate change is a science-based subject, newspaper journalists' adherence to the norm of balance may affect the quality and quantity of the coverage of climate change information, which, in turn, becomes an impediment to the improved communication of scientific climate change information in newspapers (Boykoff and Boykoff, 2007).

More than three-quarters (77.3%) of the journalists reported not having employment contracts with media houses, and they were thus working as freelance journalists. Similar findings are reported by the African Media Barometer (2015), which revealed that newspaper owners sometimes hire journalists on a freelance basis. The lack of employment contracts leads to low motivation, which, in turn, inhibits journalists' productivity in seeking and reporting on development news such as information on climate change. Low motivation is probably associated with low incentives, such as poor payment, and insufficient journalistic training, which hinders freelance journalists from dedicating much of their time and skills to the coverage of climate change issues; instead, they opt for the coverage of other news, such as crime and sensational news stories that have immediate gratification for them. Baglo (2008) and Powell (2017) similarly reported that lack of motivation – as a result of journalists' poor working conditions, lack of job security, lack of incentives and poor payment packages – led to the poor performance of newspaper journalists in reporting developmental information, including climate change.

The findings indicate that three-quarters (75%) of the newspaper journalists agreed that lack of interest in the subject was one of the challenges facing them when it came to the coverage of climate change issues. This means that a lack of interest in climate

Table 5. Challenges in the coverage of climate change information in newspapers.

Serial Number	Challenge (N = 44)	Response					
		Agree		Disagree		Undecided	
		Frequency	%	Frequency	%	Frequency	%
1	Abiding by journalistic norms such as the balancing of news on climate change	40	91.00	1	2.30	3	6.80
2	Lack of employment contracts	34	77.30	3	6.80	7	15.90
3	Lack of interest in climate change	33	75.00	7	15.90	4	9.09
4	Inadequate financial resources and time constraints	30	68.20	6	13.64	8	18.18
5	Lack of awareness of the available sources of information	28	63.64	9	20.45	7	15.91
6	Limited knowledge of climate change	26	61.36	10	22.73	8	18.18
7	Reluctance of government information officers to share information with journalists	24	54.55	9	20.45	11	25.00
8	Other challenges	15	34.00	10	22.70	19	43.20

change leads to the low coverage of information on climate change in Tanzanian newspapers. Harbinson et al. (2006) and Lyytimäki (2012) have also reported that diminishing coverage of information on climate change in newspapers is caused by a decrease in the interest of journalists and editors. Lack of interest in reporting climate change information is further associated with a lack of specialized training in climate change subject matter (Amu and Agwu, 2012) and a belief that climate change is not an attractive topic, particularly for climate change contrarians. However, contrary to the popular beliefs of the climate change deniers, Shanahan et al. (2013) are of the view that climate change is an attractive topic that is full of issues which can attract many news audiences in print media, such as newspaper journalists.

Over two-thirds (68.2%) of the newspaper journalists agreed that coverage and reportage of developmental news such as climate change was constrained by inadequate financial resources and time. The journalists reported having operated on meagre budgets. This implies that the budgets allocated to newspaper journalists are not enough to cover transportation, food, accommodation, and the acquisition of proper information and communications technology equipment – such as cameras, recorders and laptops – which is required for covering the already available information in climate change. Further, inadequate financial resources inhibit newspaper journalists from engaging in research activities. When journalists are given enough financial resources, they can participate in research activities, which, in turn, can help them cover and write about climate change, and publish about it in their newspapers. For example, to report on adaptation measures, journalists may need to travel

to rural settings to find stories about what climatic threats people are facing and how they are adapting (Shanahan et al., 2013).

The newspaper journalists in this study further revealed that a shortage of time was another challenge, which hindered them in seeking, covering and cross-checking all the sources of their stories, and ascertaining the quality of the information received. Time constraints make newspaper journalists rely on limited sources for information on climate change, which, in turn, can limit their ability to understand and hence communicate climate change issues through their newspapers. This finding tallies with the findings in other studies (e.g. Anderson, 2017; Boykoff and Roberts, 2007; Harbinson et al., 2006; Mwita, 2018; Osifelo and Honiara, 2017; Shanahan, 2009; Sharif and Medvecky, 2018; Singh and Sharma, 2013; Tairo, 2013), which reported that inadequate financial and time resources made journalists shift their priorities from real development issues to reports that provided immediate gratification for the reporters. Hence, adequate coverage and niche, high-quality reporting, based on in-depth and sound research, facts and statistics on climate change, are not achieved.

Furthermore, 63.64% of the newspaper journalists agreed that they lacked awareness of the available credible sources from which they could get information on climate change. This implies that a lack of awareness of the variety of available new sources of information on climate change and the limitations of each source hinders newspaper journalists in searching for and covering information on climate change. Similarly, Tologbonse et al. (2008) and Elia (2019c) reported that a lack of awareness of the existence of information sources acts as a barrier to

meeting information needs. One journalist strongly suggested the following in an interview:

One of the hindrances to have a quick access to climate change issues is that sometimes I don't know the varieties of sources which I can use to make news. Any attempt to help to be aware of the sources would be helpful to newspaper journalists. (Key informant, Dar es Salaam, 11 June 2018)

This demonstrates that there is a dire need for the newspaper journalists to receive information on the varieties of sources from other information professionals to enable them to produce accurate accounts of climate change.

Pertaining to knowledge, 61.4% of the respondents agreed that they did not have sufficient knowledge about climate change. Journalists' insufficient knowledge about climate change results in poor information-search strategies, poor coverage, and inaccurate and limited information reportage in newspapers. Insufficient knowledge is perhaps associated with a lack of climate-change-relevant subject matter specialization and a lack of access to timely, clear and understandable information on climate change, coupled with the language barrier, which together make journalists regard climate change as a difficult subject for media such as newspapers (similar results were reported by Bazira et al., 2019; Elia, 2019c; Harbinson et al., 2006; Painter and Bundy, 2010). The accurate and reliable reportage of matters on climate change in newspapers requires that media professionals have professional ability and enthusiasm. According to Boykoff and Boykoff (2007), the possession of climate change knowledge, experience and competence will enable journalists to perform better and more professionally in covering and reporting information on climate change in newspapers. This suggests that possession of clear knowledge of climate change subject matter helps journalists to identify and enhance the effective use of reliable information sources for their own understanding of climate change before reporting on it in newspapers to create public awareness. This resonates with Lulagambi et al. (2011), who reported that if journalists understand the issue they are covering, their audience will be better informed. Furthermore, possession of specialized knowledge, skills and dedication with regard to climate change may encourage journalists to cover more information related to climate change.

Lastly, 54.6% of the newspaper journalists revealed that coverage and reportage of climate change information in Tanzanian newspapers was constrained by the reluctance of some government

information officers to share important information with journalists. This finding agrees with Nkya (2017), who reported that sometimes it is extremely difficult to obtain information from government information officers, especially on things that are not going well in relation to developmental issues. Government information officers are the custodians of information in different government departments. However, sometimes they restrict access to such information for public use on the grounds of information secrecy, without further justifications (Kabata and Garaba, 2020). Thus, newspaper journalists cannot make use of the information held by government information officers to write a story about climate change issues. This finding is contrary to the right of access to information that is under the control of information holders (Bussiek, 2015; United Nations Environmental Programme, 2006).

Conclusion and recommendations

The main sources of climate change information consulted by newspaper journalists in Tanzania are climate change experts and daily events such as community meetings and other relevant social gatherings. These sources are interactive – enabling journalists to obtain climate change information – and easily accessible, and use and provide instant responses. Furthermore, the study established that deficient use of other potential sources of information, such as libraries, printed materials (brochures, magazines, bulletins, journals, books) and Internet websites, coupled with overarching challenges that limit newspaper journalists from covering and reporting information on climate change, may affect the quality and quantity of information published in Tanzanian newspapers for raising public awareness of climate change.

Based on these findings, several recommendations are made. The government, private newspaper media houses, climate change researchers, all of the organizations involved in the fight against climate change and journalism colleges should collaborate and devise strategies aimed at building the capacity of newspaper journalists, editors and reporters in their daily activities. This can be achieved by introducing journalism courses on climate change, which, in turn, will lead to the acquisition of specialized skills and knowledge in writing and reporting on evidence-based scientific developmental issues, including climate change, in print media such as newspapers.

Newspaper media houses should overcome the barriers that impede the coverage and reportage of climate change information. One way of overcoming such barriers is the provision of adequate financial

resources to newspaper journalists, which will help them acquire the necessary resources, including information and communications technology equipment; they should also meet other necessary expenses, such as travel and accommodation, which, in turn, will enable journalists to participate in research and increase the coverage of climate change information in newspapers.

With regard to media professionals, newspaper journalists should collaborate with library professionals who facilitate programmes on user education training for newspaper journalists. User education training will provide newspaper journalists with information on multiple new available sources and the skills of how to search, locate and effectively retrieve information from these sources; this will improve the quality and quantity of information on climate change covered in newspapers, and create awareness of the issues.

One of the major obstacles in this study was that the newspaper journalists could not be easily found in their offices during data collection; this necessitated making several appointments to meet them outside their offices. This delayed the data collection exercise within a reasonable set time. However, the objectives of the study were met.

The research for this study was limited to newspaper journalists in Tanzania and the results may therefore lack generalizability to other media outlets and information. There is hence a need for further research. Potential areas of research that would complement this study include studies to assess the sources used by journalists in Tanzanian electronic media (television and radio) to extract information on climate change and other developmental issues such as health and agriculture. Furthermore, research is needed on information literacy programmes for journalists or user education programmes for all categories of journalists in Tanzania. Studies are also needed on the information needs and information-seeking behaviour of different categories of journalists with respect to developmental information such as climate change.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

ORCID iD

Peter Onauphoo Siyao  <https://orcid.org/0000-0002-9375-9977>

Supplemental material

Supplemental material for this article is available online.

References

- African Media Barometer (2015) *The First Home Grown Analysis of the Media Landscape in Africa: Tanzania 2015*. Windhoek, Namibia: Friedrich-Ebert-Stiftung and fesmedia Africa. Available at: <https://library.fes.de/pdf-files/bueros/africa-media/11676.pdf> (accessed 26 April 2019).
- Amu CJ and Agwu AE (2012) Attitude and knowledge of print media journalists towards reporting of climate change news in Nigeria. *Journal of Agricultural Extension* 16(2). Available at: <http://dx.doi.org/10.4314/jae.v16i2.5> (accessed 4 June 2020).
- Anderson A (2017) Source influence on journalistic decisions and news coverage of climate change. *Oxford Research Encyclopedia of Climate Science*. Available at: <https://doi.org/10.1093/acrefore/9780190228620.013.356> (accessed 3 March 2019).
- Ansari MN and Zuberi NA (2012) Information needs of media practitioners in Karachi, Pakistan. *Chinese Librarianship* 33. Available at: <http://eprints.rclis.org/18424/1/cl33AZ.pdf> (accessed 15 January 2019).
- Anwar MA, Al-Ansari H and Abdullah A (2004) Information seeking behaviour of Kuwait journalists. *Libri* 54(4): 228–236.
- Aoyagi-Usui M (2008) Analysis of the effective factors for promoting pro-environmental actions from the information gain and social capital point of view. *Review of Environmental Economics and Policy Studies* 1(2): 37–50.
- Aoyagi-Usui M, Vinken H and Kuribayashi A (2003) Pro-environmental attitudes and behaviors: An international comparison. *Human Ecology Review* 10(1): 23–31.
- Arlt D, Hoppe I and Wolling J (2011) Climate change and media usage: Effects on problem awareness and behavioural intentions. *International Communication Gazette* 73(1–2): 45–63.
- Attfield S and Dowell J (2003) Information-seeking and use by newspaper journalists. *Journal of Documentation* 59(2): 187–204.
- Aziz B (2014) *The impact of new media on journalism practice in Tanzania*. Master's Thesis, University of Dar es Salaam, Tanzania.
- Baglo G (2008) The journalists working conditions in Africa. In: *UNESCO World Press Freedom Day*, Maputo, Mozambique, 2–3 May 2008. Available at: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/WPFD2009/pdf/wpfd2008_Background+paper+Baglo.pdf (accessed 1 April 2019).
- Bazira J, Muhanika H and Uki A (2019) *State of the Media in Tanzania, 2017–2018*. Dar es Salaam: Media Council of Tanzania.

- Boykoff MT (2011) *Who Speaks for the Climate? Making Sense of Media Reporting on Climate Change*. Cambridge: Cambridge University Press.
- Boykoff MT and Boykoff JM (2004) Balance as bias: Global warming and the US prestige press. *Global Environmental Change* 14(2): 125–136.
- Boykoff MT and Boykoff JM (2007) Climate change and journalistic norms: A case study of US mass-media coverage. *Geoforum* 38(6): 1190–1204.
- Boykoff MT and Roberts JT (2007) Media coverage of climate change: Current trends, strengths, weaknesses. Occasional paper 2007/3, United Nations Human Development Report 2007/2008. Available at: <http://rockyanderson.org/wp-content/uploads/2016/04/MediacoverageofCC-current-trends.pdf> (accessed 9 March 2018).
- Braun V and Clarke V (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2): 77–101.
- Bussiek H (2015) *An assessment of the new Tanzanian media laws of 2015*. Windhoek, Namibia: Friedrich-Ebert-Stiftung.
- Chang'a L, Yanda PZ and Ngana J (2010) Indigenous knowledge in seasonal rainfall prediction in Tanzania: A case of the south-western Highland of Tanzania. *Journal of Geography and Regional Planning* 3(4): 66–72.
- Choo CW (2001) Closing the cognitive gaps: How people process information. *Financial Times*, 22, August 21, 2001. Available at: <http://choo.ischool.utoronto.ca/FIS/respub/choo.nationalpost.pdf> (accessed 21 September 2019).
- Corner A (2011) Hidden Heat. Communicating climate change in Uganda: Challenges and Opportunities. Panos Eastern Africa, Kampala, 47. Available at: <https://silo.tips/download/hidden-heat-communicating-climate-change-in-uganda-challenges-and-opportunities> (accessed 15 May 2017).
- Das D (2012) Sources of agricultural information among rural women: A village level study in Assam. *International Journal of Economics, Development Research and Investment* 3(5): 1–12.
- Debela N, Mohamed C, Bridle K, et al. (2015) Perception of climate change and its impacts by smallholders in pastoral/agro pastoral systems of Borana, South Ethiopia. *SpringerPlus* 4: 236. Available at: <https://springerplus.springeropen.com/articles/10.1186/s40064-015-1012-9> (accessed 6 June 2019).
- Dinshaw A, Dixit A and McGray H (2012) Information for climate change adaptation: Lessons and needs in South Asia. Working paper, World Resources Institute, USA. Available at: https://www.preventionweb.net/files/27847_climatechangeadaptationlessonssouth.pdf (accessed 6 October 2016).
- Doddamani K and Naik R (2018) Information needs and seeking behaviour of newspaper media specialists in Shimoga District: A study. *International Journal of Innovative Knowledge Concepts* 6(1). Available at: <http://www.ijikc.co.in/sites/ijikc20/index.php/ijikc/about> (accessed 13 March 2020).
- Egeru A (2016) Climate risk management information: Sources and responses in a pastoral region in East Africa. *Climate Risk Management* 11: 1–14.
- Elia EF (2013) *Information dissemination for adaptation to climate change and variability in the agriculture sector: The case of Maluga and Chibelega villages, central Tanzania*. PhD Thesis, University of KwaZulu-Natal, South Africa.
- Elia EF (2019a) Disentangling the jargon: Journalists' access and utilisation of climate change information in Tanzania. *African Journalism Studies* 40(2): 16–33.
- Elia EF (2019b) Media coverage of climate change information by the Tanzania *Guardian* and *Daily News* in 2015. *Information Development* 35(4): 535–550.
- Elia EF (2019c) Media coverage of climate change information in Tanzania. *Global Knowledge, Memory and Communication* 68(4–5): 258–274.
- Ester P, Vinken H, Simoes S, et al. (2003) *Culture and Sustainability: A Cross-national Study of Cultural Diversity and Environmental Priorities among Mass Publics and Decision Makers*. Amsterdam: Dutch University Press.
- Freeman BC (2016) Protecting the Gulf: Climate change coverage in GCC print media. *Cogent Arts and Humanities* 3(1): 1212690.
- Future Climate for Africa (2016) *Africa's climate helping decision-makers make sense of climate information*. Cape Town: Future Climate for Africa. Available at: <http://www.futureclimateafrica.org/wp-content/uploads/2016/11/africas-climate-final-report-4nov16.pdf> (accessed 3 March 2019).
- Gadzekpo A, Tietah G and Segtub M (2018) Mediating the climate change message: Knowledge, attitudes and practices (KAP) of media practitioners in Ghana. *African Journalism Studies* 39(3): 1–23.
- Giorgi F, Jones C and Asrar GR (2009) Addressing climate information needs at the regional level: The CORDEX framework. *WMO Bulletin* 58(3): 175–183.
- Gunho L (2005) *Agenda setting effects in the digital age: Uses and effects of online media*. PhD Thesis, University of Texas at Austin, USA. Available at: <https://repositories.lib.utexas.edu/bitstream/handle/2152/12957/leeg75084.pdf> (accessed 29 May 2018).
- Harbinson R, Mugara R and Chawla A (2006) *Whatever the weather: Media attitudes to reporting climate change*. London: Panos Institute. Available at: <https://www.eldis.org/document/A21943> (accessed 6 June 2019).
- Hiles SS and Hinnant A (2014) Climate change in the newsroom: Journalists' evolving standards of objectivity when covering global warming. *Science Communication* 36(4): 428–453.
- Hossain A and Islam S (2012) Information-seeking by print media journalists in Rajshahi, Bangladesh. *IFLA Journal* 38(4): 283–288.
- Ingram D and Estate PH (2008) Sources of information. *The News Manual*. Available at: https://www.thenewsmanual.net/Manuals%20Volume%203/volume3_59.htm (accessed 13 March 2020).

- Intergovernmental Panel on Climate Change (2007) *Climate change 2007: Synthesis report. Contribution of Working Groups I, II and III to the fourth assessment report of the Intergovernmental Panel on Climate Change*. Geneva: Intergovernmental Panel on Climate Change.
- Irwansyah (2016) What do scientists say on climate change? A study of Indonesian newspapers. *Pacific Science Review B: Humanities and Social Sciences* 2(2): 58–65.
- Jiyane GV and Fairer-Wessels F (2012) Dissemination of information on climate change: A case study of women mussel harvesters at KwaNgwanase in KwaZulu-Natal. *Mousaion* 30(1): 19–38.
- Kabata V and Garaba F (2020) The legal and regulatory framework supporting the implementation of the Access to Information Act in Kenya. *Information Development* 36(3): 354–368.
- Lim J (2010) Convergence of attention and prominence dimensions of salience among major online newspapers. *Journal of Computer-Mediated Communication* 15(2): 293–313.
- Ludwig F, Van Scheltinga CT, Verhagen J, et al. (2007) Climate change impacts on developing countries – EU accountability. Available at: [https://www.europarl.europa.eu/RegData/etudes/etudes/join/2007/393511/IPOL-ENVI_ET\(2007\)393511_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/etudes/join/2007/393511/IPOL-ENVI_ET(2007)393511_EN.pdf) (accessed 3 May 2020).
- Luganda P (2005) Communication critical in mitigating climate change in Africa. In: *Open meeting of the International Human Dimensions Programme*, Bonn, Germany,.
- Lulagambi GW, Nyabuga GM and Wamala R (2011) Media coverage of science and technology in Africa. Available at: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/official_documents/science_technology_reporting_africa.pdf (accessed 12 October 2018).
- Lumosi C and McGahey D (2016) Communicating climate change for adaptation: Challenges, successes and future and priorities. Information brief, July. Available at: <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/57702/IDL-57702.pdf> (accessed 12 October 2016).
- Lund B (2019) Barriers to ideal transfer of climate change information in developing nations. *IFLA Journal* 45(4): 334–343.
- Lyytimäki J (2012) *The Environmental in Headlines: Newspaper Coverage of Climate Change and Eutrophication in Finland*. Monograph no. 42. Helsinki: Edita Prima.
- Mahajan P and Kumar P (2017) Information seeking behaviour of journalists in north India. *Library Philosophy and Practice (e-journal)*: 1648. Available at: <https://digitalcommons.unl.edu/libphilprac/1648>
- Mahalik RK (1998) *Information needs and seeking behaviours of working journalists in Orissa: An analytical study*. PhD Thesis, Utkal University, India.
- Mahapatra RK and Panda KC (2001) Information needs of working journalists in Orissa. *IASLIC Bulletin* 46(2): 105–110.
- Mansour E (2018) Adoption and use of social media as a source of information by Egyptian government journalists. *Journal of Librarianship and Information Science* 50(1): 48–67.
- Media Sustainability Index (2012) Available at: <https://www.irex.org/sites/default/files/pdf/mediasustainability-index-africa-2012-tanzania.pdf> (accessed 20 April 2018).
- Menezes S (2018) Science training for journalists: An essential tool in the post-specialist era of journalism. *Frontiers in Communication* 3(4): 1–5.
- Muthee J and Mhando N (2006) African Media Development Initiative Tanzania. *World Service Trust, Dar es Salaam, Tanzania*. 80pp. Available at: <http://africanmediainitiative.org/wp-content/uploads/2015/10/AMDI-Report-Tanzania.pdf> (accessed 26 December 2020).
- Mwita G (2018) Challenges of doing investigative journalism in Tanzania: How do you swim with sharks without being swallowed? In: *Global investigative journalism conference*, Johannesburg, South Africa, 16–19 November 2017. Available at: <https://ijec.org/2018/02/04/research-challenges-of-doing-investigative-journalism-in-tanzania-how-do-you-swim-with-sharks-without-being-swallowed> (accessed 14 January 2019).
- Nicholaus D and Martin H (1997) Assessing information needs: A case study of journalists. *Aslib Proceedings* 49(2): 43–52.
- Nkya AW (2017) *Tanzania's mainstream news media engagement with national development*. PhD Thesis, University of Bradford, UK.
- Ochieng BO (2009) Effective communication of science and climate change information to policy makers. In: *Climate Change Adaptation in Africa (CCA) symposium*, Nairobi, Kenya, 27 March 2009.
- Osifelo E and Honiara S (2017) The challenges of anonymous source stories: A case study of Solomon Islands daily newspapers. *Pacific Journalism Review* 23(2): 51–64.
- Painter J and Bundy C (2010) *Summoned by Science: Reporting Climate Change at Copenhagen and Beyond*. Oxford: Reuters Institute for the Study of Journalism.
- Poteet AR (2000) *Newspaper journalists' information seeking behaviour with online information sources*. Master's Thesis, University of North Carolina, Chapel Hill, USA. Available at: <http://ils.unc.edu/MSPapers/2605.pdf> (accessed 4 June 2020).
- Powell R (2017) Unfinished Business: Tanzania's Media Capture Challenge. In: A Schriffin (ed) *In the Service of Power: Media Capture and the Threat to Democracy*. Washington: Centre for International Media Assistance at the National Endowment for Democracy, 83–96. Available at: <https://www.almendron.com/tribuna/wp-content/uploads/2017/08/CIMA-Media-Capture-Book-F.pdf#page=85> (accessed 27 December 2020).

- Sasaka EL, Otike J and Ng'eno E (2017) Information needs and information seeking behaviour of media professionals in Kenya: A case of nation media group. *Strategic Journal of Business and Change Management* 4(4): 961–992.
- Saunders M, Lewis P and Thornhill D (2007) *Research Methods for Business Students*. 4th ed. London: Pearson Education.
- Schäfer MS and Schlichting I (2014) Media representations of climate change: A meta-analysis of the research field. *Environmental Communication* 8(2): 142–160.
- Shanahan M (2009) Time to Adapt?: Media coverage of climate change in non-industrialized countries. Available at: <https://pubs.iied.org/pdfs/G02512.pdf> (accessed 22 August 2017).
- Shanahan M (2011) Why the media matters in a warming world: A guide for policymakers in the global South. Policy brief, Climate Change Media Partnership. Available at: <http://pubs.iied.org/pdfs/G03119.pdf> (accessed 10 August 2018).
- Shanahan M, Shubert S, Scherer C, et al. (2013) *Climate Change in Africa: A Guidebook for Journalists*. Paris: UNESCO.
- Sharif A and Medvecky F (2018) Climate change news reporting in Pakistan: A qualitative analysis of environmental journalists and the barriers they face. *Journal of Science Communication* 17(1): 1–17.
- Simon J and Ryan D (2013) African newspapers online – a survey of current coverage. Available at: https://www.crl.edu/sites/default/files/d6/attachments/tg/African_online_newspapers_study_2013.pdf (accessed 20 April 2018).
- Singh C, Daron J, Bazaz A, et al. (2018) The utility of weather and climate information for adaptation decision making: Current uses and future prospects in Africa and India. *Journal of Climate and Development* 10(5): 389–405.
- Singh G and Sharma M (2013) Information seeking behaviour of newspaper journalists. *International Journal of Library and Information Science* 5(7): 225–234.
- Siyao PO and Sife AS (2018) Coverage of climate change information in Tanzanian newspapers. *Global Knowledge, Memory and Communication* 67(6–7): 425–437.
- Statrasts AM (2004) *Battling the knowledge factor: A study of farmers information seeking learning and knowledge process with an online environment in Queensland*. PhD Thesis, The University of Queensland, Australia.
- Sunband E, Biel A and Garling T (2009) Knowledge and confidence in knowledge about climate change among experts, journalists, politicians and laypersons. *Environmental Behaviour* 41(2): 281–302.
- Tagbo E (2010) Media coverage of climate change in Africa: A case study of Nigeria and South Africa. Reuters Institute fellowship paper, University of Oxford, UK.
- Tairo A (2013) Print media awareness campaign on impacts of climate change in Africa. In: L D'Amore and P Kalifungwa (eds) *Meeting the Challenges of Climate Change to Tourism: Case Studies of Best Practice*. Newcastle upon Tyne: Cambridge Scholar's, 364–369.
- Takahashi B, Kanni H, Frederick F, et al. (2016) Climate change reporting in Great Lakes region newspapers: A comparative study of the use of expert sources. *Environmental Communication* 11(1): 106–121.
- Tologbonse D, Fashola O and Obadiah M (2008) Policy issues in meeting rice farmers agricultural information needs in Niger State. *Journal of Agricultural Extension* 12(2): 84–94.
- UNESCO (2019) Enhance consciousness towards climate crisis: Training journalists for ethical and accurate reporting on climate change. Available at: <https://bangkok.unesco.org/content/training-journalists-ethical-and-accurate-reporting-climate-change> (accessed 14 March 2020).
- United Nations Environmental Programme (2006) *Raising Awareness of Climate Change: A Handbook for Government Focal Points*. Nairobi: United Nations Office.
- United Republic of Tanzania (2012) National Climate Change Strategy (NCCS) (2012–2017). Vice President's Office – Environment Division. October 2012. Available at: <https://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/laws/4820.pdf> (accessed 15 December 2015).
- United Republic of Tanzania (2016) Information, culture, arts and sports statistics report, 2015 Tanzania mainland. Available at: <http://www.habari.go.tz/index.php/publications> (accessed 3 April 2018).
- Watson B and Cavanah S (2015) Community information needs: A theory and methodological framework. *Mass Communication and Society* 18(5): 651–673.
- Wema E (2018) Investigating reading culture among students in higher learning institutions in Tanzania. *University of Dar es Salaam Library Journal* 13(1): 4–19.
- Wihbey J and Ward B (2016) Communicating about climate change with journalists and media producers. Available at: <https://doi.org/10.1093/acrefore/9780190228620.013.407> (accessed 13 March 2020).
- Wilson TD (1997) Information behaviour: An interdisciplinary perspective. *Information Processing and Management* 33(4): 551–572.
- Zakar MZ (2005) Emancipatory role of information technology in rural Pakistan. *Journal of Behavioural Sciences* 16(1-2): 26–45. Available at: <http://cite.seerx.ist.psu.edu/viewdoc/download;jsessionid=507FEB6CED37BE825543861491650213?doi=10.1.1.121.4550&rep=rep1&type=pdf> (accessed 5 January 2016).

Author biographies

Peter Onauphoo Siyao is a Librarian at Mzumbe University, Morogoro, United Republic of Tanzania. He has authored and co-authored several papers in the field of library and information science. His areas of research interest include: Media communication, climate change

information communication, information needs and seeking behaviour of user groups, information literacy, and research in electronic and print records management. Currently, Mr Siyao is a full-time PhD Student at Sokoine University of Agriculture, Tanzania. E-mail: posiyao@mzumbe.ac.tz

Alfred Said Sife is a Library Professor at Moshi Cooperative University (MoCU), Kilimanjaro, United Republic of Tanzania. He has extensively researched, authored and co-authored several papers in the field of library and information science. E-mail: alfred.sife@mocu.ac.tz



Information-seeking behaviour of science and technology researchers in Nigeria: A survey of the Federal Institute of Industrial Research Oshodi

Olayinka Babayemi Makinde

Department of Information Science, University of South Africa, South Africa

Glenrose Velile Jiyane

Department of Information Studies, University of Zululand, South Africa

Tinashe Mugwisi

Department of Information Science, University of South Africa, South Africa

Abstract

The science and technology sector plays an important role in the growth and diversification of the Nigerian economy. This article examines the information-seeking behaviour of science and technology researchers in Nigeria in order for the right approach to be taken with respect to information provision. A survey methodology was used for the study and 114 multidisciplinary science and technology researchers at the Federal Institute of Industrial Research Oshodi served as the respondents. The findings of the study revealed that science and technology researchers frequently sourced information from journals and knowledgeable persons; the Internet was the most frequent information source. The science and technology researchers used information for carrying out research and solving personal needs, among other things. The challenges identified in using information sources included outdated books and lack of adoption of electronic services. The study recommended that efforts should be directed at improving researchers' access to information and the establishment of an institutional electronic database should be encouraged.

Keywords

Information needs, information-seeking behaviour, information sources, Federal Institute of Industrial Research Oshodi, science and technology researchers

Introduction

The Nigerian Economic Summit Group (2019) outlined that over the years, the science and technology sector has played an important role in the growth and diversification of the Nigerian economy. The group further stressed that a lot remains to be accomplished as Nigeria is currently underperforming relative to its human capital, and it does not appear that there is a comprehensive strategy for science and technology growth. Factors such as the low level of research and development investment, weak institutions (at the local, state and federal levels) and inadequate provision of the research information desired by

researchers, among others, are responsible for this underperformance.

Information is regarded as an indispensable resource that contributes in a great way to the scientific and technological advancements of a country, and its existence is designed to solve problems when it is sought regularly. The discovery of a challenging situation (otherwise known as a knowledge gap)

Corresponding author:

Olayinka Babayemi Makinde, Department of Information Science, University of South Africa, Pretoria 0002, South Africa. Email: babayemimakinde@gmail.com

creates an information need (Case and Given, 2016). Ingwersen and Järvelin (2005) underlined that such recognition of information needs may lead to information-seeking that aims to obtain the desired information. Wilson (2016) submitted that the attribute of information-seeking will develop into changing individual, collective or collaborative information behaviour.

Howlader and Islam (2019) have identified that many factors determine the search for information by the seeker and will inform their behaviour. Hosain and Islam (2012) emphasized that one of the key factors is the profession to which the researcher belongs. Idiegbeyan-Ose et al. (2014) revealed that science and technology researchers crave information (have an awareness of information-need gaps) as they proceed from one stage to the next in their research. This craving for information to address science and technology knowledge gaps must be addressed by existing relevant and accurate information, as desired and sought by researchers (exhibiting information-seeking behaviour), since all science and technology researchers have the common trait of utilizing information for their laudable work (Acheampong and Dzandu, 2015). If not, sufficient provision has to be made for the much-needed information for research.

The present study is distinct in the field of user studies in that it is a single-case study that focuses on the information-seeking behaviour of multidisciplinary science and technology researchers working at the Federal Institute of Industrial Research Oshodi (FIIRO) under the Federal Ministry of Science and Technology in Nigeria. FIIRO stands out as a research institute, and its uniqueness informs this study because of its broad mandate to accelerate the industrialization process in Nigeria. The science and technology researchers have, over the years, developed technologies that have promoted the ideals of industrial and national development. Therefore, an in-depth study of their information needs and information-seeking behaviour from the point of view of information-source usage is critical in determining these context-dependent concepts.

As an institute, FIIRO (2016) has a library that was established in 1957 out of the necessity to provide information support for the research and development activities of the organization. It is a section under the Library and Documentation Division, reporting directly to the directorate of Planning, Technology Transfer and Information Management, with the goal of providing a flow of expertise information to its parent body, industries, and educational and government institutions (Onilude and Apampa,

2010). In order to accomplish this goal, scientific, technical, economic and administrative information materials are acquired and processed to enhance accessibility and use (FIIRO, 2016). Some of the information resources in the FIIRO library include books, journals, abstracts, research reports, technical memoranda, seminar papers and publications of its parent body, and there are librarians who coordinate these materials for their proper utilization (FIIRO, 2016).

For the purpose of this study, the multidisciplinary nature of science and technology researchers and the varying information sources utilized by them as they engage in research activities become a major concern. The detailed analysis will suggest solutions to improving research information for science and technology researchers. This article emanates from a doctoral thesis submitted at the University of South Africa titled *Information needs and information-seeking behaviour of researchers in an industrial research institute in Nigeria* (Makinde, 2018).

First, we review related works and outline the research questions. The research methodology is then examined, after which the findings and discussion are presented. A conclusion is drawn and the lessons learned, with recommendations, are offered. We state the limitations of the study and, finally, future possible studies are identified.

Related works

Information needs of Nigerian scientists

Scientists have different information needs and there are many factors that impact on these needs. According to Kaniki (2003), education, economic status, geographical location, the availability of information systems and services, awareness of the available information systems and services, and access to services are among the factors affecting the information needs of scientists. Relatedly, Idiegbeyan-Ose et al. (2014) and Nel (2015) opined that scientists have complex information needs because of their diverse disciplines. In concurrence, Kwon (2017) and Research Libraries UK (2012) stated that scientists are not considered a homogenous group, because their information behaviour varies by subject field. Research Libraries UK (2012) further agreed that in terms of scientists' information needs, scientists differ in particular in relation to their discipline and/or subject. On the other hand, Mugwisi et al. (2014) discovered that the information needs of scientists varied in terms of the type of information required, with no specific inclination to a specific discipline. This shows that the information needs of multidisciplinary

scientists do not tilt to just one discipline but are spread across the disciplines available in any research organization, further revealing the intricacy of information needs. Therefore, it is convenient to say that understanding the information needs of scientists may be challenging (Kuruppu and Gruber, 2006).

Momoh and Folorunsho (2017) revealed the information needs of scientists at the Nigerian Stored Products Research Institute. In decreasing order, these were for recent developments in the discipline and government agricultural policies (both ranked first); for writing articles or publications in journals (second); for preparing for job interviews or promotion and for seminars or conferences (both third); and for updating knowledge on general issues (last). Ezeala and Hundu (2016), in their study of the National Veterinary Research Institute in Nigeria, discovered that scientists needed information for research (91.3%), conference papers (78.3%), communicating ideas (67.4%), updating knowledge (45%), new projects (38%), establishing facts (23%), current awareness (21%), lecturing (18%) and decision-making (17%).

Uddin et al. (2019) studied the information needs of scientists in three research institutes – namely, the Nigerian Institute for Oil Palm Research, Rubber Research Institute of Nigeria and Cocoa Research Institute of Nigeria. Their information needs varied and were based on a deficiency of information in the area of study and the purpose of seeking information. With regard to information deficiency, information was needed for different disciplinary studies with varying percentages; for information-seeking purposes, the scientists mostly required information for research, assisting researchers and general awareness. Likewise, Idiegbeyan-Ose et al. (2014) revealed that scientists mostly needed information on research, current issues, general knowledge, academic issues and research publications.

Abdulsalami (2013) identified the information needs of scientists at the Nigerian Institute of Transport Technology based on purpose. In descending order, they were identified as knowledge update (35%), research (32%), writing and presenting papers (25%), and preparing class lectures (8%). Similarly, Abiolu (2019), in a survey, investigated the primary information needs of scientists during a conference organized at a university. Approximately 88% of the participants were from the academic sector, while 12% were from the non-academic sector. She revealed that the information needs of the scientists were for research (79.8%), keeping abreast of current developments (61.9%) and new designs (47.6%).

Information sources used by science and technology researchers

Mugwisi et al. (2014), in an overview of the information needs of science and technology researchers, studied their information-seeking patterns. These were mainly determined by the information sources employed and their availability. They revealed that all of the researchers considered the Internet to be a very important information source and, as a result, showed a preference for electronic sources. The library as the first port of call was poorly rated, with only 10.7% of the researchers indicating that they would visit a library first. Mugwisi et al. (2014) further indicated that the researchers had access to electronic resources such as the Access to Global Online Research in Agriculture (AGORA) database. Electronic resources were found to be grossly underutilized, given the quantity of full-text articles available in the AGORA database. Uddin et al. (2019) revealed that researchers consulted information sources as follows: the Internet (77.4%), the library (17.7%), personal collections (11.3%) and colleagues (8.1%). They did not consult departmental collections at all. Adeyinka (2014) reported that in terms of the information services/sources used by science and technology researchers in the 24 research and development institutions they studied in Nigeria, the use of Internet services by the scientists was closely followed by communications services and then library services. In almost all the research and development institutions, the frequency of the use of library services in terms of a physical visit was on the decrease, while there was an increase in the use of Internet services. Makinde et al. (2019a) reported that science and technology researchers utilized various information and communication technology resources, especially computers, to obtain research information from online journals, but most online resources were not sought for at the institute under study because an Internet connection was not provided. Consequently, alternatives were used, such as cybercafes, mobile phones or iPads, and personal laptop or desktop computers with a personal subscription to the Internet.

Chun et al. (2015) studied the information behaviour of science and technology researchers at the Korea Atomic Energy Research Institute. They discovered that the information sources frequently used by the researchers were academic journals (13%), study reports and Internet portals (12% each), books (11%), conference proceedings (11%), and commercial databases, multimedia information, and weekly magazines or newspapers (10% each). The main databases utilized by the researchers included in this study

were NUCLI S21 (the institute's electronic database, which mostly covers science and engineering information (14%)); Scopus, Google Scholar and Naver Academic (12% each); ASTM International's specification database, Korean Studies Information's domestic journal, the Original Copy database and the World Intellectual Property Organization's patent-search database (10% each); Journal Citation Reports and Korean Industrial Standards (9% each); and other databases (2%).

Vilar et al. (2012) identified the preferred information sources of science and technology researchers with respect to their research disciplines. They stated that natural science researchers preferred research papers and dissertations, technical researchers preferred standards and patents, interdisciplinary researchers preferred e-archives, and biotechnology researchers used research papers and dissertations but preferred e-sources. Makinde et al. (2019b) revealed the factors affecting the information-seeking behaviours of science and technology researchers as they seek information for their projects. The problem of accessibility to information sources was indicated by the majority of the respondents, with them mentioning the circulation, issuing, indexing, cataloguing/classification and reliability/referencing of e-resources as challenges encountered when using information sources.

Haines et al. (2010) revealed that science and technology researchers relied on a small network of individuals in their institutions and at other institutions to satisfy their information needs. They indicated that science and technology researchers also preferred online sources to print sources. This was due to their convenience and immediacy. They also highlighted that science and technology researchers' information-source activity centred on the people they work with every day and colleagues working on closely related research in other institutions. Pontis et al. (2017) reported that science and technology researchers utilized digital tools (hard sources) and interaction with peers and colleagues (soft sources) when they had recognized needs.

Generally, Paliwal et al. (2016) reported that science and technology researchers required both formal and informal information sources. The formal sources, in descending order, were textbooks (94.28%), subject journals (85.71%) and conference proceedings (77.14%). Other formal sources included theses or dissertations, indexing or abstracting journals, research reports, encyclopaedias, technical reports, manuals or handbooks, bibliographies, standards and, finally, patents. The informal sources, in descending order, included attending seminars

and conferences (91.42%), discussion with colleagues (68.51%) and visiting exhibitions (62.85%). Other informal sources were telephone conversations with librarians and experts, and fax messages. The electronic information sources used, in descending order, were e-journals (94.28%), emails (91.42%), e-books (71.42%), e-theses (57.14%) and CD-ROM databases (40%).

Ezeala and Hundu (2016) discussed the information sources consulted by science and technology researchers via an electronic library unit. They were journals (consulted by 100% of the science and technology researchers), CD-ROMs (63%), abstracts and indexes (60%), conference proceedings (51%), professional colleagues (39%), annual reports (13%) and textbooks (10%). Momoh and Folorunsho (2017) revealed the decreasing order of utilization of information sources by science and technology researchers – namely, journals, followed by online databases, theses and dissertations, conference proceedings, government publications, annual reports, newspaper clippings, reference materials (encyclopaedias, dictionaries, etc.), textbooks, and indexes and abstracts. Acheampong and Dzandu (2015), in their study of science and technology researchers at a research institute in Ghana, noted that the majority of the researchers indicated that they acquired the information they needed through formal and informal channels. However, they preferred formal to informal channels. They embraced the formal channels of conferences and meetings, and listening to presentations and discussions. Acheampong and Dzandu (2015) also discovered that the researchers preferred journal articles in an electronic format to a print format. They identified that this might be due to the researchers' occasional use of information centres or libraries. Nwosu (2009) revealed that science and technology researchers preferred using primary sources of information, particularly journals, review papers and research reports. In addition, he identified that communication with professional colleagues was also important for exchanging current research information.

Abdulsalami (2013) revealed the information sources utilized by science and technology researchers to be, in descending order, textbooks (26%), theses or research reports (21%), periodicals (13%), and general books and reference books (11% each). The media used to access these documents were the Internet (43%), references from periodical articles (21%), library catalogues and references from books (14% each), and abstracting journals (8%). Moreover, Abiolu (2019) also reported on the information sources used by science and technology researchers. The most popular were books and scholarly journals,

while the least popular were standards or patents, the library and the institutional repository.

Challenges faced by Nigerian scientists when using information sources

Abdulsalami (2013) revealed that the barriers faced by scientists as they accessed information sources for their projects were insufficient materials (29%), the available information sources being difficult to locate in the library (25%), the information for researchers being scattered in too many sources (18%), difficulty in using catalogues (17%) and the age of some of the available information sources (11%). Abiolu (2019) uncovered that the constraints faced by scientists when using information sources included an irregular power supply (84.5%), the cost of information materials (70.2%), inadequate funds to procure these sources (69.0%), inadequate library resources (36.9%), the unavailability of sources (22.6%), the lack of personal expertise (21.4%), the needed information not being available in the sources (19.0%), non-familiarity with the sources (16.7%) and a bad management culture (1.2%). Momoh and Folorunsho (2017) stressed the challenges faced by scientists as they utilized information sources during the information-seeking process. They comprised improvement of Internet services (the highest) followed by provision of up-to-date information resources and, lastly, regular orientation on the use of the library and its services. Makinde et al. (2019b) listed the factors responsible for the difficulties faced in accessing information sources by scientists. They were a lack of recent books (67.5%), poor infrastructure (64.9%), the environment (56.1%), bibliographic obstacles (37.7%), the costs of accessing information (28.1%), lack of awareness (23.7%), the library staff (8.8%), the information explosion (7.9%) and declining budgets and rising costs (4.4%). Okonoko et al. (2015) highlighted the challenges that scientists faced associated with using information sources as they sought information in Nigerian libraries. They identified network fluctuation (75%), inadequate knowledge of the use of catalogues (73%), insufficient numbers of librarians in the library (57%), the incompleteness of records (44%), information scattered in too many sources (40%), the nonchalant attitude of library staff (39%) and the lack of time to access information resources (26%).

Methodology

We reviewed a substantial amount of literature on the information-seeking behaviour of science and technology researchers. In order to reach multidisciplinary

science and technology researchers and out of time considerations, we depended on the survey questionnaire method for this study.

Science and technology researchers at FIIRO were the target population for this study. There were 165 science and technology researchers in all. It was found from different studies that science and technology researchers always have diverse information-seeking behaviours. The probability sampling methods adopted for this study were random and stratified sampling. The respondents were placed into subpopulations (strata) according to the departments in the institute: Food Technology; Project Design and Development; Biotechnology; Chemical Fibre and Environmental Technology; Production, Analytical and Laboratory Management; and Planning, Technology Transfer and Information Management.

A structured questionnaire, Appendix 1 was designed for the purpose of data collection; it had 7 sections with 62 questions. The survey items were chosen from previous studies or modified to suit the needs of the present study. The questionnaire used open-ended and closed questions. It elicited information on the participants' background, information needs and information sources, and factors affecting their information-seeking behaviour, evaluating accessibility, the information communications technology infrastructure at the institute, and the information services provision to meet the information needs of the science and technology researchers. The language used for the questionnaire was English.

The questionnaire was pretested to check for any issues with the wording of the questions. After talking and discussing with the respondents, some minor challenges identified during the pretesting were reviewed. The final printed questionnaire was distributed to the 165 science and technology researchers at FIIRO by the researcher and trained research assistants. The data collection period was two months, between October and November 2017. Consent forms were signed by the respondents to assure them that their participation would be kept confidential. During the study period, we distributed the questionnaires and asked the respondents to leave them with the departmental secretaries after completion. We collected the completed questionnaires at a later date.

Out of 165 questionnaires, 121 (73.3%) completed questionnaires were returned. Inaccuracies were identified in seven of the questionnaires and they were discarded and not analysed. Therefore, the usable returns totalled 114 (69.1%). All of the valid returned questionnaires were coded. The Statistical Package for the Social Sciences (SPSS) version 17 was used for the analyses. In order to answer the research

questions, frequency counts, percentages, and narrative and relational descriptions were used for the presentation of the data. Tables were used to express relationships among the variables.

Research questions

The aim of the study was to investigate the information-seeking behaviour of science and technology researchers in Nigeria with a survey of FIIRO. The study sought to answer the following research questions:

1. What are the characteristics of FIIRO researchers?
2. What are the information needs and information-seeking behaviour of FIIRO researchers?
3. What is the frequency of the usage of information sources by FIIRO researchers?
4. What are the electronic information sources in the field of science and technology utilized by FIIRO researchers?
5. What are the challenges faced by FIIRO researchers when using information sources?

Findings and discussion

Characteristics of FIIRO respondents

Table 1 shows the demographic information of the respondents. Out of the 114 respondents in the study, 60 (52.6%) were male and 54 (47.4%) were female. In terms of age range, 49 (43.0%) were between 30 and 39 years of age, with a little more than a fifth (25: 21.9%) representing the 40–49 age group and 16 (14.0%) representing the 50+ age group. A little more than a third of the respondents were holders of a Bachelor's degree (40: 35.1%), while a little less than a third of the respondents were holders of a Master's degree (35: 30.7%). Less than a fifth of the respondents had a PhD (18: 15.8%). Over a fifth of the respondents were in the Food Technology (30: 26.4%) and Biotechnology (25: 22.0%) departments, respectively. Slightly less than a fifth of the respondents were in the Chemical Fibre and Environmental Technology (21: 18.5%) and the Project Design and Development (20: 17.3%) departments, respectively. Slightly more than one-third of the respondents (39: 34.2%) had worked as researchers in FIIRO for 1–5 years, with a little more than a fifth of the respondents (26: 22.8%) working for between 6 and 10 years. Eighty-two respondents (approximately 72%) were found in the lower categories of 1–5 years, 6–10 years and 11–15 years.

The characteristics of the FIIRO respondents, such as their gender, age, education and years of working as researchers, and the numbers of respondents working in the institute's departments are of significant importance in resource development and utilization, and, of course, perception analysis. Table 1 shows a difference of 5.2% between the male and female respondents. This indicated a close range between the male and female respondents in relation to gender. There were more females than males in the Food Technology, Biotechnology, and Chemical Fibre and Environmental Technology departments, with them numbering 20 (67.0%), 14 (56.0%) and 11 (52.0%), respectively. This showed a good development of research sensitivity at FIIRO, considering the clamour for gender equality in the workplace. Our findings refute previous results reported in the literature, such as those of Momoh and Folorunsho (2017), where males accounted for 64.0% and females for 36.0% of the researchers, and Uddin et al. (2019), where males were 87.3% and females 12.7%. As expected, in the Project Design and Development department, there were four times more males than females. This confirms Abiolu's (2019) findings, where there were more males than females in engineering positions. This could be attributed to the physical energy required to execute engineering work and societal restrictions (Youdeowei and Uwandu, 2016). In the Production, Analytical and Laboratory Management department and Planning, Technology Transfer and Information Management department, there was an equal number of males and females.

The study found that there was a statistically reliable significant difference between the respondents' years of working as a researcher at FIIRO and demographic factors (age and education). For instance, there was a statistically reliable significant difference between the respondents' years of working at FIIRO and their age ($p = 0.000$; $p < .05$) and education ($p = 0.000$; $p < .05$). There was no statistically reliable significant difference between the respondents' years of working at FIIRO and their sex ($p = 0.064$; $p < .05$).

Table 1 also shows that, with regard to age range, the lowest numbers (16: 14.0%) are found in the 50+ age group. This implies that the number of respondents nearing the retirement age of 60 as stipulated by the civil service rule in Nigeria represents the least number of respondents in this study. The positive implication is that many young researchers can grow with senior researchers and learn from them, making the knowledge-transfer process easy, without the creation of a knowledge vacuum when older researchers leave the institute. The negative implication is that it

Table 1. Demographic information of the respondents.

	<i>n</i>	%	Department	<i>n</i>	%	Male (%)	Female (%)
Male	60	52.6	Food Technology	30	26.4	33	67
Female	54	47.4	Project Design and Development	20	17.3	80	20
Total	114	100.0	Biotechnology	25	22.0	44	56
Age			Chemical Fibre and Environmental Technology	21	18.5	48	52
20–29	24	21.1	Production, Analytical and Laboratory Management	14	12.3	50	50
30–39	49	43.0	Planning, Technology Transfer and Information Management	4	3.5	50	50
40–49	25	21.9	Total	114	100.0		
50+	16	14.0					
Total	114	100.0					
Education							
Bachelor's degree	40	35.1					
Postgraduate diploma	21	18.4					
Master's degree	35	30.7					
PhD	18	15.8					
Total	114	100.0					
Years of working as researcher							
1–5	39	34.2					
6–10	26	22.8					
11–15	17	14.9					
16–20	18	15.8					
21–25	6	5.3					
26+	8	7.0					
Total	114	100.0					

raises the issue of a brain drain, where senior researchers leave for greener pastures abroad. This study supports the studies by Mba and Ekeopara (2012), Emeghara (2013), Joshua et al. (2014), Chikwe et al. (2015), and Radwan and Sakr (2018), which have raised the subject of a brain drain in Africa, and especially Nigeria, hampering research development and, by inference, adversely affecting technological growth.

The data on the educational qualifications (Table 1) of the respondents shows that a greater percentage of the respondents (61: 53.5%) had a Bachelor's degree and postgraduate diploma, while a lower percentage had a PhD. The fact that the respondents possessing a Bachelor's degree and postgraduate diploma constituted more than half of the respondents, and PhD-holders constituted not even a fifth of the respondents, does not augur well for thorough research work. Researchers are expected to hold doctoral research degrees so that they are well equipped to carry out research. However, there are indications that the director general of the institute has been encouraging researchers to study for their Master's and PhD

degrees, with some of the respondents being on study leave within and outside the country.

In terms of the number of years working as researchers, the majority of the respondents (approximately 72%) were found in the lower categories of 1–5, 6–10 and 11–15 years. This showed that many of the respondents had a short experience of researching. This finding is consistent with those of Momoh and Folorunsho (2017), who showed that 72% of the researchers in their study had between 1 and 15 years of research experience. This connotes that the respondents in these lower categories should be supported and equipped with information resources. Also, they should be sufficiently trained, or more experienced researchers are needed at FIIRO to complement the existing researchers in the form of the employment of experienced researchers or collaborative research with experienced researchers outside the institute, either within or outside the country. This finding also substantiates those of Kumwenda et al. (2017), who stated that young African researchers mentioned a lack of experienced researchers as a major challenge they faced in their career development. As a result,

Table 2. Information-seeking purposes (%; $n = 114$).

Information-seeking purposes	Food Technology	Project Design and Development	Biotechnology	Chemical Fibre and Environmental Technology	Production, Analytical and Laboratory Management	Planning, Technology Transfer and Information Management	% of n
When carrying out research	100.0	100.0	100.0	100.0	100.0	100.0	100.0
When solving personal needs	63.3	75.0	56.0	66.7	71.4	75.0	65.8
For general awareness	60.0	45.0	52.0	47.6	64.3	75.0	54.4
When attending to clients' needs	53.3	60.0	20.0	57.1	57.1	100.0	50.0
When attending to academic needs	30.0	35.0	32.0	42.9	42.9	50.0	36.0
For work-related discussions	20.0	25.0	28.0	38.1	28.6	100.0	29.8

they would like to see the establishment of mentorship programmes, where research knowledge can be passed on from experienced to young researchers.

Information needs and information-seeking behaviour of FIRO respondents

The respondents were asked about their information needs, which, in turn, would determine their information-seeking behaviour. Their information needs were determined from two perspectives in this study: their information-seeking purposes and the types of information required for their work.

Generally, with respect to their information-seeking purposes, Table 2 shows that 100% of the respondents indicated that they required information when carrying out research. This was followed by requiring information for solving personal needs (65.8%), general awareness (54.4%), attending to clients' needs (50.0%), attending to academic needs (36.0%) and work-related discussions (29.8%). In relation to the six departments of the institute, all of the respondents (100%) from each department indicated that they required information when researching. Remarkably, the respondents from all six departments with the exception of Planning, Technology Transfer and Information Management indicated requiring information for solving personal needs in second place. Similarly, the respondents of all six departments with the exception of Biotechnology indicated requiring information for work-related discussions as the least of their information-seeking purposes. Attending to academic needs was not indicated by many of the departmental respondents (30.0% for Food Technology, 35.0% for Project

Design and Development, 32.0% for Biotechnology and 42.9% each for Chemical Fibre and Environmental Technology and Production, Analytical and Laboratory Management), except for half (50.0%) of the Planning, Technology Transfer and Information Management respondents. This finding is contrary to the earlier indication that many science and technology researchers have been encouraged to study for Master's and PhD qualifications by the director general of the institute.

With the majority of the respondents indicating carrying out research, solving personal needs and general awareness as information needs based on information-seeking purposes, the finding concurs with the work of Idiegbeyan-Ose et al. (2014), which revealed that science and technology researchers mostly seek information on research, current issues and general knowledge. The study by Uddin et al. (2019) also agrees with the present study in that the surveyed researchers revealed, based on their information-seeking purposes, that information for conducting research and information for general awareness were rated highly. Our finding on the prioritization of research by Nigerian researchers supports Ezeala and Hundu (2016), Momoh and Folorunsho (2017) and Abiolu (2019), who concluded that Nigerian researchers, on the basis of their information-seeking purposes, rated information for research activities very highly. The present finding concerning the respondents from the Project Design and Development department, who are mostly engineers, also agrees with those of Abdulsalami (2013) and Abiolu (2019), who revealed that research engineers also needed information for research purposes. This outcome

Table 3. Information types and respondents' indications.

Information types	Respondents' indications	Highest information types (%)	Lowest information types (%)
Agricultural sciences	1, 3, 4, 5, 6		
Analytical marketing	6		
Analytical research	1, 3, 4, 6		20.0 (Biotechnology) 16.7 (Food Technology)
Baking and milling	3, 6		
Biochemistry	1, 3, 6		
Chemical technology	2, 6		
Electrical and electronics engineering	6		
Enzyme technology	1, 2, 3, 6	80.0 (Food Technology)	
Environmental technology	6	42.9 (Chemical Fibre and Environmental Technology)	
Fabrication technology	5, 6		
Food safety and quality management	3, 4, 6		
Laboratory management and sciences	1, 6		
Materials development and metallurgy	2, 5, 6		4.8 (Chemical Fibre and Environmental Technology)
Mechanical engineering	5, 6	75.0 (Project Design and Development)	
Microbiology	1, 2, 3, 4, 6		7.1 (Production, Analytical and Laboratory Management)
Molecular biology and genetics	1, 6	84.0 (Biotechnology)	
Nutrition and toxicology	3, 6		
Packing technology	2, 3, 6		
Polymer and textiles	2, 6		
Product development	1, 2, 5, 6		
Product quality evaluation	2, 3, 4, 6		
Production	4, 6	57.1 (Production, Analytical and Laboratory Management)	
Project and process development	4, 5, 6		
Prototype equipment design and specifications	5, 6		
Pulp and paper technology	2, 6		
Waste biology and fermentation	1, 6		
Works and services	5, 6		30.0 (Project Design and Development)

Key: 1 = Information types indicated by Biotechnology respondents; 2 = Information types indicated by Chemical Fibre and Environmental Technology respondents; 3 = Information types indicated by Food Technology respondents; 4 = Information types indicated by Production, Analytical and Laboratory Management respondents; 5 = Information types indicated by Project Design and Development respondents; 6 = Information types indicated by Planning, Technology Transfer and Information Management respondents.

revealed that science and technology researchers value information on research above any other types of information in order to enable them to innovatively extend the frontiers of knowledge created through research.

With respect to the types of information required for the respondents' work, Table 3 shows that there were 27 groupings and different information types employed for their work. Table 3 shows that the Production, Analytical and Laboratory Management

respondents indicated seven different information types; the Project Design and Development respondents indicated eight; both the Biotechnology and the Chemical Fibre and Environmental Technology respondents indicated nine; the Food Technology respondents indicated ten; and the Planning, Technology Transfer and Information Management respondents indicated all of the information types.

The type of information required by most of the Biotechnology respondents was on molecular biology and genetics (84.0%), while the least required was on analytical research (20.0%). The information type required by most Chemical Fibre and Environmental Technology respondents was on environmental technology (42.9%), while the least required was on materials development and metallurgy (4.8%). The information type required by most of the Food Technology respondents was on enzyme technology (80.0%), while the least required was on analytical research (16.7%). The information type required by most Production, Analytical and Laboratory Management respondents was on production (57.1%), while the least required was on microbiology (7.1%). The information type required by most Project Design and Development respondents was on mechanical engineering (75.0%), while the least required was on works and services (30.0%).

It was evident that information specific to each department's focus/mandate was most sought across the divide. Mechanical engineering information was most sought by the Project Design and Development respondents; enzyme technology information by the Food Technology respondents; and analytical research information by the Production, Analytical and Laboratory Management respondents; environmental technology information by the Chemical Fibre and Environmental Technology respondents; and molecular biology/genetics information by the Biotechnology respondents.

Some of the respondents had some information types in common. The Biotechnology and Chemical Fibre and Environmental Technology respondents had the product development information type in common. The Chemical Fibre and Environmental Technology and Food Technology respondents had the packaging technology, product development, microbiology and product quality evaluation information types in common. The Food Technology and Production, Analytical and Laboratory Management respondents had product quality evaluation and food safety and quality management information in common. The Production, Analytical and Laboratory Management and Project Design and Development respondents had the project and process development

and agricultural sciences information types in common. Agricultural sciences information was sought by all the departments except for the Chemical Fibre and Environmental Technology department, with both Biotechnology and Project Design and Development respondents seeking agricultural sciences information the most. Also, microbiology information was sought by all departments except for the Project Design and Development department. This showed collaborative research among the science and technology researchers. Surprisingly, electrical and electronics engineering information was not sought by the Project Design and Development respondents.

The Planning, Technology Transfer and Information Management respondents required all the information types that were mentioned by the respondents, with no information type being more highly ranked than the others. This was because the role of the Planning, Technology Transfer and Information Management respondents required them to have knowledge of all the research projects carried out by all of the FIIRO respondents, in order for them to be able to transfer the discoveries from these research projects to clients in the form of technology/knowledge transfer and adoption.

The commonly shared and different information types indicated by the respondents revealed the complexity of researchers' information needs and, consequently, their information-seeking behaviour, meaning that information should be provided to different researchers based on specified information types in order for their information needs to be accommodated by librarians and libraries. This finding supports Idiegbeyan-Ose et al.'s (2014) study, which revealed that researchers had complex information needs because of their diverse areas of specialization. Likewise, our finding also concurs with Nel (2015) and Mugwisi et al. (2014), who observed that the information needs of researchers were in composite groupings or varied in terms of the type of information required, with no specific inclination to a specific discipline. This showed the many discipline-specific needs for information and thus the complexity of information-seeking behaviour. Our study also agrees with Uddin et al. (2019), who showed that researchers need and seek research information based on a deficiency of information in diverse areas of study.

Frequency of usage of information sources by FIIRO respondents

The respondents were required to indicate how often they consulted information sources. Table 4 shows

Table 4. Usage of information sources (%; $n = 114$).

Information sources	Food Technology	Project Design and Development	Biotechnology	Chemical Fibre and Environmental Technology	Production, Analytical and Laboratory Management	Planning, Technology Transfer and Information Management	% of n
Internet sources	100.0	100.0	100.0	100.0	92.9	100.0	99.1
Journals	83.3	90.0	100.0	100.0	85.7	75.0	91.2
Knowledgeable persons	76.7	90.0	72.0	57.1	78.6	25.0	72.8
Review articles	70.0	65.0	88.0	52.4	50.0	50.0	66.7
Books	63.3	60.0	52.0	52.4	57.1	75.0	57.9
Discussions with colleagues	66.7	40.0	80.0	38.1	35.7	50.0	55.3
Conference abstracts/proceedings	20.0	20.0	80.0	52.4	14.3	50.0	48.2
Research reports/patents/factsheets	53.3	70.0	8.0	57.1	21.4	75.0	43.9
Email/webinar/discussion forums	50.0	25.0	44.0	33.3	28.6	100.0	40.4
Pamphlets/leaflets	6.7	70.0	72.0	4.8	7.1	100.0	40.0
Professional meetings/workshops	33.3	55.0	44.0	28.6	14.3	25.0	36.0
Technical reports	6.7	70.0	72.0	4.8	7.1	100.0	35.1
Library catalogues	3.3	95.0	20.0	47.6	0.0	100.0	34.2
Indexes/abstracts of journals	53.3	30.0	20.0	4.8	42.9	50.0	31.6
Newsletters	3.3	95.0	12.0	42.9	0.0	25.0	28.9
Theses/dissertations	40.0	5.0	12.0	42.9	0.0	25.0	24.6
Content pages	6.7	10.0	12.0	9.5	0.0	25.0	8.8
Librarian/library staff	10.0	10.0	8.0	4.8	7.1	25.0	8.8

that many formal and informal information sources were consulted at different levels. This supports earlier studies, such as those conducted by Haines et al. (2010), Vilar et al. (2012), Abdulsalami (2013), Mugwisi et al. (2014), Acheampong and Dzandu (2015), Chun et al. (2015), Ezeala and Hundu (2016), Paliwal et al. (2016), Momoh and Folorunsho (2017), Pontis et al. (2017) and Abiolu (2019), which established that researchers used a variety of sources depending on need and availability.

Generally, for all of the respondents, Table 4 shows that Internet sources were the most frequently used information source, with 99.1% of the respondents indicating so. This was followed by journals (91.2%), consulting with knowledgeable persons in the field (72.8%) and review articles (66.7%). The least used resources, in descending order, were indexes and abstracts of journals (31.6%), newsletters (28.9%), theses and dissertations (24.6%), and librarians/library staff and content pages (8.8% each). This was most likely due to their occasional usage of the institute's library and the personal subscription by

these science and technology researchers to Internet service providers. The finding that the majority of the respondents used Internet sources most frequently is supported by earlier studies, such as Mugwisi et al. (2014), who revealed that 100% of the science and technology researchers in their study considered the Internet to be a very important information source and, as a result, showed a preference for electronic sources; Adeyinka (2014), who found that the Internet was ranked top in terms of the information services/sources used by science and technology researchers; Makinde et al. (2019a), who revealed that science and technology researchers utilized various information and communication technology resources, especially computers, to obtain the required research information from online journals using the Internet; Chun et al. (2015), who pointed out that the Internet was ranked second to academic journals by just 1%; Haines et al. (2010), who indicated that science and technology researchers preferred online sources; Ezeala and Hundu (2016), who found that science and technology researchers consulted other information

sources via an electronic medium (the Internet), with 100% consulting electronic journals; Acheampong and Dzandu (2015), who discovered that science and technology researchers preferred journal articles in an electronic format; and Abdulsalami (2013), who revealed that the main medium used to access the materials needed by science and technology researchers was the Internet.

However, the study revealed that it was only the Food Technology respondents (100%), Project Design and Development respondents (100%), and Production, Analytical and Laboratory Management respondents (92.9%) who indicated Internet sources alone as the highest in terms of the frequency of usage of information sources. Both the Biotechnology and the Chemical Fibre and Environmental Technology respondents indicated Internet sources and journal articles as the highest in terms of frequency of usage, with 100% of the respondents indicating so for each of these departments. This finding confirms Vilar et al.'s study (2012), which revealed that biotechnology researchers used research papers and e-sources for their work. Information sources in the form of technical reports, pamphlets or leaflets, Internet sources, library catalogues, and emails, blogs, webinars and discussion forums were all indicated by 100% of the Planning, Technology Transfer and Information Management respondents. This is because they are a link between the institute and the outside world. They are expected to convey the innovations of the institute to the institute's clients. Thus, they will frequently require many information sources at a high level. With just 8.8% of all respondents and very low responses for each departmental respondent for frequency of use, librarians or library staff as information sources were shown to be poorly utilized. With just 8.8% of all the respondents and each department's respondents indicating very low percentages for frequency of usage of librarian/library staff, this information source was established to be poorly utilized. This result agrees with Mugwisi et al. (2014), where the library as the first port of call was also poorly rated; Makinde et al. (2019b), where the challenges of circulation, issuing, indexing and cataloguing/classification were mentioned by science and technology researchers, indicating that libraries or library staff as an information source were not sufficiently used; Acheampong and Dzandu (2015), who revealed that researchers preferred journal articles in an electronic format to a print format; and Abiolu (2019), who uncovered that an organizational library was one of the least

used information sources. The current study runs contrary to Abdulsalami's (2013) and Abiolu's (2019) findings, which revealed that books were the foremost information source for engineers. The Project Design and Development respondents, as engineers, indicated Internet sources foremost. This might be connected with the preference of the Internet due to outdated books in the library. The Internet enables the respondents to access up-to-date sources, including books.

Since the majority of the respondents stated that they utilized Internet sources more than any others to obtain the information they needed to assist in their research, the study sought to establish what these electronic information resources were.

Specification of electronic information sources

The respondents indicated the electronic information sources they had used in the preceding six months. These included academic social networks and search engines, as well as databases. Generally, Table 5 shows that most of the respondents used Google Scholar (75.4%). The other electronic information sources used, in descending order, were ResearchGate (64.9%), African Journals Online (57.0%), the Web of Science Citation Indexes (52.6%), the Science Citation Index Expanded and the Science Information Database (46.5% each), Science Open (23.7%), Scopus (22.8%), the Agricultural and Environmental Science Database (21.1%) and SciFinder Scholar on the Web (21.0%). Across the departments, a high use of the following electronic information sources was observed: the Science Citation Index Expanded (100.0% of the Planning, Technology Transfer and Information Management respondents), Research Gate (81.0% of the Chemical Fibre and Environmental Technology respondents), African Journals Online (75.0% of the Project Design and Development respondents), the Science Information Database (75.0% of the Planning, Technology Transfer and Information Management respondents) and the Web of Science Citation Indexes (64.3% of the Production, Analytical and Laboratory Management respondents). The least used electronic information sources across the departments were the Science Information Database (33.3% of the Food Technology respondents), African Journals Online (25.0% of the Planning, Technology Transfer and Information Management respondents), the Science Citation Index Expanded (23.8% of the Chemical Fibre and Environmental Technology respondents), Scopus (14.3% of the Chemical Fibre and

Table 5. Information sources in the field of science and technology (%; $n = 114$).

Information sources	Food Technology	Project Design and Development	Biotechnology	Chemical Fibre and Environmental Technology	Production, Analytical and Laboratory Management	Planning, Technology Transfer and Information Management	% of n
Google Scholar	63.3	80.0	72.0	81.0	85.0	100.0	75.4
ResearchGate	66.7	55.0	60.0	81.0	57.1	75.0	64.9
African Journals Online	46.7	75.0	60.0	52.4	57.1	25.0	57.0
Web of Science Citation Indexes	43.3	60.0	48.0	57.1	64.3	50.0	52.6
Science Citation Index Expanded	26.7	80.0	36.0	23.8	78.6	100.0	46.5
Science Information Database	33.3	45.0	56.0	47.6	50.0	75.0	46.5
Science Open	20.0	15.0	32.0	19.0	35.7	25.0	23.7
Scopus	30.0	30.0	16.0	14.3	21.4	25.0	22.8
SciFinder Scholar on the Web	10.0	5.0	36.0	33.3	14.3	50.0	21.1
Agricultural and Environmental Science Database	16.7	10.0	24.0	14.3	42.9	25.0	21.0

Environmental Technology respondents), Science Open (15.0% of the Project Design and Development respondents), the Agricultural and Environmental Science Database (10.0% of the Project Design and Development respondents) and SciFinder Scholar on the Web (5.0% of the Project Design and Development respondents).

The specification of different electronic information sources implied that the respondents used different sources to a large extent, which also agreed with their different information needs as seen in this study. They used more multidisciplinary electronic information sources than subject-specific sources, as demonstrated in the descending order of usage. This supports Mugwisi et al. (2014), who revealed that AGORA electronic information sources were used by researchers; Chun et al. (2015), who asserted that the majority of the science and technology researchers in their survey used multidisciplinary electronic information sources, including Scopus and Google Scholar; and Pontis et al. (2017), who revealed that science and technology researchers utilized digital tools and databases (electronic information sources and social networks) such as Google Scholar and ResearchGate to a great extent when they had recognized needs. From our study, it is evident that the FIIRO science and technology researchers found it easy to use multidisciplinary electronic information sources like Google Scholar, ResearchGate, African

Journals Online, the Web of Science Citation Indexes, the Science Citation Index Expanded and the Science Information Database in the course of their research. These sources were preferred over subject-specific sources such as SciFinder Scholar on the Web.

Challenges faced by the FIIRO respondents when using information sources

The study also identified the challenges the respondents faced in accessing information sources. Table 6 shows that the provision of more recent books in different fields, indicated by 39.5% of the respondents, was the topmost challenge. Other challenges, in descending order, included the adoption of electronic services (37.7%), improved computer availability for online searching (25.4%), adequate shelving (21.1%), well-catalogued books (19.3%), improved indexing (9.6%) and well-trained library staff (7.9%). Table 6 also presents a prioritized list of the challenges faced by the respondents from different departments when using information sources. Our finding agrees with Abdulsalami (2013), Okonoko et al. (2015), Momoh and Folorunsho (2017), Abiolu (2019) and Makinde et al. (2019b), who revealed that challenges such as the provision of recent books, orientation on the importance and use of catalogues, the training and retraining of library staff, improved Internet

Table 6. Challenges faced by FIIRO respondents when using information sources (%; $n = 114$).

Challenges	Food Technology	Project Design and Development	Biotechnology	Chemical Fibre and Environmental Technology	Production, Analytical and Laboratory Management	Planning, Technology Transfer and Information Management	% of n
Provision of more recent books in different fields	36.7	25.0	20.0	52.4	78.6	50.0	39.5
Adequate shelving	10.0	15.0	8.0	14.3	85.7	25.0	21.1
Adoption of electronic services	3.3	25.0	16.0	47.6	85.7	25.0	37.7
Well-trained library staff	3.3	15.0	4.0	9.5	14.3	0.0	7.9
Improved computers available for online search	30.0	0.0	16.0	38.1	57.1	0.0	25.4
Well-catalogued books	6.7	20.0	8.0	23.8	57.1	25.0	19.3
Improved indexing	6.7	25.0	0.0	9.5	0.0	50.0	9.6

connections, automation of the library and the provision of electronic resources, when appropriately addressed, will help science and technology researchers in using research information provided by a library.

Conclusion

This study revealed that different information sources are available to the science and technology researchers at FIIRO, but not all of them are used satisfactorily. Generally, the prioritized and most frequently used information sources include Internet sources, journals, knowledgeable persons, review articles, books and discussion with colleagues. Apart from these, conference abstracts or proceedings, research reports, patents, factsheets, emails, webinars, discussion forums and pamphlets or leaflets are used, although not prioritized. Surprisingly, information sources that are not used judiciously include professional meetings or workshops, technical reports and the library or library staff.

Based on their information-seeking purposes, central to the information needs of the science and technology researchers is information for carrying out research, solving personal needs, general awareness and attending to clients' needs (consultation). Based on the types of information required for the respondents' work, central to their information needs is, for the Biotechnology respondents, molecular biology/genetics; for the Chemical Fibre and Environmental Technology respondents, environmental technology;

for the Food Technology respondents, enzyme technology; for the Production, Analytical and Laboratory Management respondents, production; for the Project Design and Development respondents, mechanical engineering; and for the Planning, Technology Transfer and Information Management respondents, all the information types.

Science and technology researchers generally have insufficient information

The primary lesson to be learned from the study is that most of the science and technology researchers in the institute are not sufficiently provided with information for their work. This challenge manifests mostly in the form of them not frequently using the librarian or library staff, library catalogues and technical reports. Other challenges that indicated insufficient information were outdated books and complaints regarding the adoption of electronic services, computer system availability, inadequate shelving, and cataloguing and indexing. This ultimately affects researchers' productivity in terms of research. It is therefore recommended to stakeholders in the institute's research information development that efforts should be directed at improving researchers' access to information.

Priority of information needs

The findings of the study revealed that the science and technology researchers placed a high value on information for carrying out research, and that their

information needs may be discipline-specific – such as the Biotechnology respondents requiring information on molecular biology and genetics; the Chemical Fibre and Environmental Technology respondents requiring environmental technology; the Food Technology respondents requiring enzyme technology; the Production, Analytical and Laboratory Management respondents requiring production; the Project Design and Development respondents requiring mechanical engineering; and the Planning, Technology Transfer and Information Management respondents requiring all the information types. The identification of the prioritized information needs at any particular period is therefore inherently necessary for planning strategies to supply researchers with the required information. However, priorities do change with time and different circumstances; thus, it is believed that these priorities may change at a later period. It is therefore recommended that stakeholders make the effort to assess the priorities of the science and technology researchers' information needs regularly, before developing new information provision programmes for these researchers.

Provision of electronic information sources and an institutional electronic database

The study gathered that the science and technology researchers utilized electronic information sources to a large extent, such as Google Scholar, ResearchGate, African Journals Online, the Web of Science Citation Indexes, the Science Citation Index Expanded and the Science Information Database. It is therefore recommended that the stakeholders should promptly subscribe to the Internet and these indicated information sources and many more. Also, an institutional electronic database should be encouraged, where publications by the institute's researchers and the institution's research output can be stored for easy access.

Training and retraining of library staff and library revamp

The findings of this study revealed the lack of use of the library staff as an information source, and the challenge of the library staff not being well trained was also mentioned by the researchers. This does not speak well of a specialized library in a research institute. It is recommended that the institute's library should be revamped and its staff should be trained in the art of modern librarianship so that the complex information needs and information-seeking behaviour of the science and technology researchers can be met.

The results of this study are based on a limited number of science and technology researchers at FIIRO. The study's results might be applicable as a reference in the science and technology domain with similar institutions. However, this study cannot be generalized across other research domains and institutions.

Future studies should look at using a different methodological approach, such as focus group discussions and interviews, for other science and technology organizations under the Federal Ministry of Science and Technology for the purpose of comparing results.


Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

ORCID iD

Olayinka Babayemi Makinde  <https://orcid.org/0000-0003-2168-6470>

Glenrose Velile Jiyane  <https://orcid.org/0000-0002-2856-3695>

Supplemental material

Supplemental material for this article is available online.

References

- Abdulsalami LT (2013) A study of information needs of engineers in Nigerian Institute of Transport Technology, Zaria. *International Journal of Engineering and Science* 2(4): 57–65.
- Abiolu OA (2019) Engineers, their information needs and information sources used: A Nigerian perspective. *Library Philosophy and Practice* 2570. Available at: <https://digitalcommons.unl.edu/libphilprac/2570> (accessed 4 April 2020).
- Acheampong LD and Dzandu M (2015) Information seeking behaviour of crops research scientists in Ghana. *Information and Knowledge Management* 5(5): 88–93.
- Adeyinka FM (2014) Information services and scientists' research productivity in Nigeria: Evidence from research and development institutions. *Information and Knowledge Management* 4(11): 54–61.
- Case DO and Given LM (2016) *Looking for Information: A Survey of Research on Information Seeking, Needs and Behaviour*. London: Emerald.
- Chikwe CK, Ogidi RC and Nwachukwu K (2015) Challenges of research and human capital development in Nigeria. *Journal of Education and Practice* 6(28): 44–47.

- Chun Y, Yi J, Park J, et al. (2015) Information behaviours of nuclear scientists at Korea Atomic Energy Research Institute. *Journal of East Asian Libraries* 161(6): 1–22.
- Emeghara EE (2013) Brain drain as a clog in the wheel of Nigeria's development: The university education system in focus. *International Journal of Development and Management Review* 8(1): 110–121.
- Ezeala LO and Hundu JT (2016) Use of information by researchers: A case study of National Veterinary Research Institute, Vom. *Journal of Research in Humanities and Social Science* 4(8): 28–35.
- FIIRO (2016) Library and documentation division. Library, documentation and intellectual property (IPTTO) division. Available at: <http://www.fiiro.org/index.php/departments/planning-technology-transfer-information-management/library-documentation> (accessed 3 April 2020).
- Haines LL, Light J, O'Malley D, et al. (2010) Information-seeking behaviour of basic science researchers: Implications for library services. *Journal of the Medical Library Association* 98(1): 73–81.
- Hossain MA and Islam MS (2012) Information-seeking by print media journalists in Rajshahi, Bangladesh. *IFLA Journal* 38(4): 283–288.
- Howlader AI and Islam MA (2019) Information-seeking behaviour of undergraduate students: A developing country perspective. *IFLA Journal* 54(2): 140–156.
- Idiegbeyan-Ose J, Okoedion I and Nwadioha V (2014) Information needs utilization by science and technology researchers in Edo and Delta State Nigeria. *International Journal of Innovation and Applied Research* 2(6): 144–150.
- Ingwersen P and Järvelin V (2005) *The Turn: Integration of Information Seeking and Retrieval in Context*. Dordrecht: Springer.
- Joshua S, Ilemobola PO and Ebiri O (2014) Leadership, brain drain and human capacity building in Africa: The Nigerian experience. *Research Journal in Organizational Psychology and Educational Studies* 3(4): 283–290.
- Kaniki AM (2003) Information needs for basic research: An African perspective. Available at: <http://www.codata.info/archives/2003/03march/papers/kaniki.pdf> (accessed 6 April 2020).
- Kumwenda S, Niang EA, Orondo PW, et al. (2017) Challenges facing young African scientists in their research careers: A qualitative exploratory study. *Malawi Medical Journal* 29(1): 1–4.
- Kuruppu PU and Gruber AM (2006) Understanding the information needs of academic scholars in agricultural and biological sciences. *Journal of Academic Librarianship* 32(6): 609–623.
- Kwon N (2017) How work positions affect the research activity and information behaviour of laboratory scientists in the research lifecycle: Applying activity theory. *Information Research* 22(1). Available at: <http://informa-tionr.net/ir/22-1/paper744.html> (accessed 4 April 2020).
- Makinde OB (2018) *Information needs and information seeking behaviour of researchers in an industrial research institute in Nigeria*. PhD Thesis, University of South Africa, South Africa. Available at: http://uir.unisa.ac.za/bitstream/handle/10500/25071/thesis_makinde_ob.pdf;jsessionid=C7C582311AA139C9945ADACBE138D907?sequence=1 (accessed 31 May 2020).
- Makinde OB, Jiyane GV and Mugwisi T (2019a) Evaluation of the level of adoption of information and communication technology resources and the usage of alternative sources in obtaining information by researchers of a federal research institute in Nigeria. *Library Philosophy and Practice* 2380. Available at: <https://digitalcommons.unl.edu/libphilprac/2380> (accessed 6 April 2020).
- Makinde OB, Jiyane GV and Mugwisi T (2019b) Factors and challenges affecting the information-seeking behaviour of science and technology researchers. *Library Philosophy and Practice* 2575. Available at: <https://digitalcommons.unl.edu/libphilprac/2575> (accessed 6 April 2020).
- Mba PN and Ekeopara C (2012) Brain drain: Implication for economic growth in Nigeria. *American Journal of Social Issues and Humanities* 2(2): 41–47.
- Momoh EO and Folorunsho AL (2017) Information needs and information seeking behaviour of researchers in Nigerian Stored Products Research Institute, Ilorin, Kwara State. *Library Philosophy and Practice* 2080. Available at: <https://digitalcommons.unl.edu/libphilprac/2080> (accessed 5 April 2020).
- Mugwisi T, Ocholla D and Mostert V (2014) An overview of the information needs of agricultural researchers and extension workers in Zimbabwe. *Libri* 64(1): 85–108.
- Nel MA (2015) *Information needs, information seeking behaviour and information use behaviour of researchers at the Faculty of Veterinary Science, University of Pretoria and how these needs are being met by the information support delivered by the Jotello F Soga Library*. Magister Informatonis Scientiae Information Science Dissertation, University of Pretoria, South Africa. Available at: <https://repository.up.ac.za/handle/2263/50085?show=full> (accessed 3 April 2020).
- Nigerian Economic Summit Group (2019) Nigeria 2050: Shifting gears. Report of the 25th Nigerian Economic Summit. Available at: https://nesgroup.org/storage/app/public/summit_reports/25th%20Nigerian%20Economic%20Summit%20Report_1580725220.pdf (accessed 4 April 2020).
- Nwosu MC (2009) Information needs of agricultural scientists in the National Root Crops Research Institute Umudike for increased cassava production in Nigeria. *Communicate* 11(2): 53–87.
- Okonoko V, Njideka NO and Mazah D (2015) A comparative study of information seeking behaviour of researchers in Nigeria libraries: Librarians' perspective. *International Journal of Academic Research and Reflection* 3(4): 76–88.

- Onilude OO and Apampa OR (2010) Effects of information and communication technology on research and development activities: The FIRO experience. *Library Philosophy and Practice* 420. Available at: <https://digitalcommons.unl.edu/libphilprac/420> (accessed 4 April 2020).
- Paliwal S, Bhardwaj M and Sharma S (2016) Information needs and information seeking behaviour of faculty members of science and technology, GB Nagar district: A study. *International Journal of Research in Library Science* 2(1): 63–78.
- Pontis S, Blandford A, Greifeneder E, et al. (2017) Keeping up to date: An academic researcher's information journey. *Journal of the Association for Information Science and Technology* 68(1): 22–35.
- Radwan A and Sakr M (2018) Exploring 'brain circulation' as a concept to mitigate brain drain in Africa and improve EU–Africa cooperation in the field of science and technology. *South African Journal of International Affairs* 25(4): 517–529.
- Research Libraries UK (2012) Re-skilling for research: An investigation into the role and skills of subject and liaison librarians required to effectively support the evolving information needs of researchers. Available at: <https://www.rluk.ac.uk/wp-content/uploads/2014/02/RLUK-Re-skilling.pdf> (accessed 4 April 2020).
- Uddin IO, Agwu AE and Anugwa IQ (2019) Information needs and challenges of agricultural researchers and extension workers in Edo State, Nigeria. *Traektorîa Nauki = Path of Science* 5(6): 6001–6011.
- Vilar P, Juznic P and Bartol T (2012) Slovenian researchers: What influences their information behaviour? Available at: file:///C:/Users/user/Downloads/zbornikan_kara.pdf (accessed 4 April 2020).
- Wilson TD (2016) A general theory of human information behaviour. *Information Research* 21(4). Available at: <http://InformationR.net/ir/21-4/istic/istic1601.html> (accessed 3 April 2020).
- Youdeowei T and Uwandu E (2016) Why there are few females in engineering. *Vanguard News*, 1 December. Available at: <https://www.vanguardngr.com/2016/12/why-there-are-few-females-in-engineering/> (accessed 3 April 2020).

Author biographies

Olayinka Babayemi Makinde, PhD, is a researcher in the field of information science. His research interests include information user studies, information and communication technologies for development, infometrics, electronic libraries, and medical and agricultural information systems.

Glenrose Velile Jiyane, PhD, is Professor of Library and Information Science at the University of Zululand. Her teaching and research areas include library and information science education and training, information user studies, knowledge management, inter-organizational knowledge-sharing, scholarly communication and research methods.

Tinashe Mugwisi, PhD, is a research fellow in the Department of Information Science at the University of South Africa. His research interests include information seeking and retrieval, agriculture information, and information and communication technologies for development.



Business intelligence in academic libraries in Jordan: Opportunities and challenges

International Federation of
Library Associations and Institutions
2021, Vol. 47(1) 37–50
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0340035220931882
journals.sagepub.com/home/iff



Faten Hamad 
University of Jordan, Jordan

Razan Al-Aamr
University of Jordan, Jordan

Sinaria Abdel Jabbar
University of Jordan, Jordan

Hussam Fakhuri
University of Jordan, Jordan

Abstract

Data plays a major role in helping to understand clearly the changing needs of academic library users, and in helping libraries to innovate their services and procedures accordingly. Data needs to be transformed into information for decision-making and strategic planning. Business intelligence offers powerful analytical tools, such as visualization and data-mining tools, which lead to informed decisions and hence transform the user's experience, bringing it to a more advanced level. This research investigates the concept of business intelligence from the perceptions of information department staff at academic libraries in Jordan. The opportunities and challenges associated with it are also discussed and explored. As indicated by the results, information department staff agree that business intelligence improves decision-making, helping decision-makers to make the most accurate and timely decisions for the library. The results also indicate that an appropriate infrastructure is important for the successful implementation of business intelligence in academic libraries in Jordan.

Keywords

Business intelligence, academic libraries, data analytics

Submitted: 9 January 2020; Accepted: 24 March 2020.

Introduction

The era of digitalization and digital transformation is fundamentally leading to the growing importance and adoption of information and communications technology (ICT) and information science in doing business (Loebbecke and Picot, 2015). Accordingly, organizations are more reliant on ICT and big-data analytical capabilities to ensure quick adaptation to changes and that they stay competitive (Chen and Siau, 2011). Decision-making based on business intelligence and analytics use is thus considered a foundation for innovation and agility in organizations of different kinds (Chen and Siau, 2011; Jaklič et al., 2018). Business

intelligence provides 'technological capabilities to support decision processes with reliable information and analytical insights' (Kowalczyk and Buxmann, 2015: p. 1). It enables organizations to become smarter, work smarter and make better decisions through information (Larson and Chang, 2016).

Business intelligence is centred on the information value chain, which is the process used to derive value from information and information from data (Ranjan,

Corresponding author:

Faten Hamad, University of Jordan, Amman 11942, Jordan.
Email: f.hamad@ju.edu.jo

2009; Bailey and Francis, 2008). Business intelligence enables senior managers in organizations of all sizes, academic libraries included, to make informed decisions about everything from marketing, research and development, and/or investing to long-term business strategies. Business intelligence can extract business value from data. It is focused on data discovery and understanding how information might be used (Larson and Chang, 2016).

In an academic library environment, data plays a major role in helping libraries to understand clearly the changing needs of their users, and to reshape and restructure their services and procedures accordingly. Moreover, the interaction between users and the stored information can be taken into consideration by librarians to improve service quality. This data needs to be transformed into information and knowledge, while libraries need to understand how to transform, analyse and present data to create knowledge and redefine library services, and also for decision-making and strategic planning (Wang et al., 2016). Business intelligence offers powerful analytical tools such as information-visualization and data-mining tools (Reinhalter and Wittmann, 2014). Research also shows that the use of business intelligence provides value to organizations by increasing their organizational performance (Audzeyeva and Hudson, 2016; Olszak, 2016; Sharma et al., 2014).

Libraries in general, and academic libraries in particular, are undergoing major changes, especially since the information and technological revolution. Many institutions, including academic libraries, now believe that it is essential to make informed decisions based on their data about user interactions and other data that is made available through the library management system. Consequently, it is important to investigate the concept of business intelligence in academic libraries at Jordanian universities from the following perspectives: (1) its application and use, and the objectives of using business intelligence in academic libraries; (2) the requirements to apply business intelligence tools in academic libraries; and (3) its anticipated effect on academic libraries' environment. It is also important to investigate the obstacles relating to the application of business intelligence in academic libraries in Jordan.

Literature review

There have been many research studies on big-data analytics, with all of them asserting its ability to provide deeper and more valuable insights, and thus contribute to better decision-making (TechAmerica Foundation, 2012; Wang et al., 2016). Big-data tools

have the demonstrated ability to leverage business value and provide support for decision-making and strategic planning based on valuable information that can be derived from the data (Höchtel et al., 2016). Academic libraries are exposed to both internal and external factors that encourage and cause organizational changes. One of these changes is related to analytic tools for gaining insight into business value – specifically, business intelligence tools for making informed decisions and strategic planning.

Business intelligence

The amount of data in the world is growing exponentially, in all formats – be it structured, semi-structured or unstructured data. Data has the potential to be mined and become useful information. However, the huge amount of data exceeds the processing capacity of traditional databases or a single machine. The evolving field of data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights (Balachandran and Prasad, 2017).

Business intelligence and data analytics give businesses useful information and better insight into both structured and unstructured data, which can lead to better-informed decision-making (Duggal and Paul, 2013; Fan and Bifet, 2013). Traditional approaches are handicapped by utilizing huge amounts of organizational data, high-velocity data and the variety of formats that comprise big data (Barton and Court, 2012). Daniel (2015) pointed out that big data can influence the practice of academic libraries, from enhancing user experiences to improved library services, more effective evidence-based decision-making and strategic responses to changing global trends. Hilbert (2013) also pointed out that big data provides a cost-effective vision to improve decision-making in all organizations. Big data provides an opportunity for libraries to develop their competitive value and raise the efficiency of their services. Also, Al Shawabkeh's (2018) results confirmed that big data is useful for libraries' strategic planning and decision-making.

Companies require that their employees have the ability to find and use data in order to determine trends, develop meaningful insights and provide actionable recommendations to improve the business (Macy and Coates, 2016). In a business context, big-data analytics examine big data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences and any other useful business information (Duggal and Paul, 2013). Data and analytics create the most profound trends in business intelligence today. Business intelligence and big-data

analytics enable the handling of massive data sets, find out patterns in real time, predict outcomes and test hypotheses. For instance, business intelligence can produce more accurate business insights, an understanding of business change, better planning and forecasting, and cost assessment and analysis (Rus-som, 2011). According to Phillips-Wren et al. (2015), business intelligence, decision support and analytics are essential to making business decisions in many organizations. In line with this, Hamad et al.'s (2018) results indicated that big data plays an important role in helping libraries to make more cost-effective, innovative and informed decisions.

Business intelligence can be defined as 'an umbrella term that includes the applications, infrastructure and tools, and best practices that enable access to and analysis of information to improve and optimize decisions and performance' (Gartner, 2019). Balachandran and Prasad (2017) also described 'business intelligence' as a term that refers to technologies, applications and practices for the collection, integration, analysis and presentation of business information to support better and faster business decision-making. Miller et al. (2013) defined business intelligence as a systematic programme for gathering, analysing and managing information that can affect the process of planning, decisions and operations in an organizational context. According to Negash (2004:), '[business intelligence] systems combine data gathering, data storage, and knowledge management with analytical tools to present complex internal and competitive information to planners and decision makers'.

According to the aforementioned definitions, business intelligence consists of analytics tools and methods that can be applied to any organizational context for gathering and analysing its information to provide support for decision-making processes. Any organizational context, including libraries, can benefit from business intelligence utilities and functionalities to achieve a competitive advantage among its peers. Stachowiak et al. (2007) affirmed the importance of business intelligence in giving organizations the ability to acquire in-depth knowledge of all of the factors related to the success of the organization's plans and objectives, and to make records of large amounts of data, analyse them and create high-level reports to support administrative work, decision-making, and the organization of their short- and long-term plans.

Business intelligence has become indispensable for organizations' strategic planning and decision-making. For instance, Olszak (2013) presented the main tasks of business intelligence as follows:

- Make full use of big data to help the organization gain competitive advantages.
- Convert raw information into meaningful information that can be used in strategic decisions.
- Provide timely information on key competitors to determine threats and risks.

Business intelligence in academic libraries

In an ever-changing business world, many organizations are facing growing pressure to develop their business intelligence efforts quickly and economically in order to maintain a competitive advantage. Also, the advancements in ICT tools and services are changing the way businesses' decisions can be made, and therefore enhance organizational strategic planning. Indeed, this has also created the need for libraries and information centres to develop innovative and creative services to keep pace with a fast-changing society, in order to strengthen the trend of the digital library environment and be able to survive in it. Libraries, including academic libraries, and information professionals are willing to accept changes and new knowledge in order to stay relevant and useful in a rapidly changing society (Majid and Khoo, 2009). The ability to use data and analytic methods is changing library roles.

The mission of academic libraries is to support the teaching and learning process by facilitating access to information (Peltier-Davis, 2011). Libraries need information about resource consumption, service quality, and the library's impact on research and student learning in order to fulfil their mission. It appears that libraries have entered a period where measurement and their mission are inextricably linked, and effective management is evidence-based management (Wilson, 2008). One of the major factors that can effectively enhance the drive for innovation and creativity in libraries is the use of business intelligence in the library environment. Many studies have confirmed that the use of business intelligence within firms improves individual business activities, such as marketing (Xu et al., 2017) and customer relationship management (Nam et al., 2019), and ultimately leads to enhancing the overall organizational performance (Bronzo et al., 2013; Vukšić et al., 2013). This can be applied to the academic library environment.

Academic libraries hold a variety of data from various data sources. Likewise, libraries are no longer merely consumers of data, but also suppliers and producers of data. For instance, academic libraries hold data on patron activities, such as transactional loans produced by a centralized library management

system; usage patterns, based on the activity logs of a discovery system; and user behaviour, such as web statistical data that is used to track end-user behaviour on a library website, hosted e-journals and digital repositories (Hodges et al., 2010; Nfila, 2009). They also collect social network commentary on their Facebook sites or Twitter channels. Accordingly, libraries can and should leverage their data to plan and make informed decisions. In line with this, Thomas and Brown (2019) pointed out that libraries have a long history of collecting and managing data on collections, such as borrowing statistics, gate counts, ebook borrowing and click-throughs. This has contributed to changing methods of content delivery in libraries. These data sets can contribute to enhancing strategic management decision-making if handled appropriately using business intelligence tools. Business intelligence can be considered the foundation on which academic libraries can reinvent their business model and bring together the evidence to help make decisions about library services and routines (Iwu-James et al., 2020). Therefore, Dudycz et al. (2017) recommended decision-making contexts for decision paths as follows:

- Financial and operational planning support.
- Business risk analysis, investment decision support.
- Performance measurement for the company as a whole.
- Performance analysis across various segments of the company (Dudycz et al., 2017: 6).

Therefore, business intelligence enables academic libraries to measure, monitor and manage their performance more effectively. They need frameworks and tool kits to leverage data capability in their strategic planning and decision-making.

Academic libraries have a clear role in data analytics to help them enhance the quality of their services (Al-Barashdi and Al-Karousi, 2019; Kumar and Priyadarsini, 2016). Accordingly, libraries are harnessing their data for more informed planning and decision-making. Fernandez (2016) identified the potential of artificial intelligence – business intelligence as an application of artificial intelligence – in academic libraries to provide completely new ways of interacting with information. Business intelligence techniques and analytical methods in libraries are useful for library planning, informing business operations and optimizing collections. Directors and operational managers need timely and insightful management information (business intelligence) derived from library data. In order to make informed decisions in

annual planning, senior library managers need to have evidence for operational decision-making, future investments and staff deployment. This evidence can be gathered from data collection and data analysis, followed by subsequent insight.

Researchers including Zhang et al. (2010) and Thorpe et al. (2019) have used library access and usage statistics data to explore libraries and how they link with student performance. This is a direct application of business intelligence tools to derive information and insights from a library's statistics and data based on student interaction in order to gain insights into its relation to their performance. For instance, Stone and Ramsden's (2013) study concluded that there was a statistically significant correlation across a number of universities in the UK between library activity data and student achievement based on data on e-resources usage, library borrowing statistics and library gate entries. Such data provides insights for managers and administrators about library services and the adequacy of the library collection.

The IFLA Big Data Special Interest Group (2016) asserted that managers also need to have a vision of where library data services are transitioning to, to know how to stay ahead in the data-science era, and to have a good understanding of data and related skills in data science. Business intelligence can fit into the big picture of academic libraries, helping in analysing their current service catalogues, for instance, in order to determine if adjustment in service delivery roles and skills is needed to align with increasingly data-intensive communities on campus and beyond.

Methods

Data was collected through interviews with library staff ($n = 44$) who were working in the information division at academic libraries in Jordanian public (i.e. governmental) universities. Table I illustrates the number of interviews conducted to explore library staff's perception of the concept of business intelligence in academic libraries at Jordanian public universities. Permission was gained from the library's director to conduct semi-structured interviews with members of staff from the information divisions who were involved in technology application at their libraries in order to allow them to express their viewpoints and experiences fully. A list of questions was prepared (as a guide). However, the interviewees had a lot of leeway, especially since one of the researchers came from a computer science background. A great deal of information and insights was therefore offered on some matters. The list of topics and related questions covered were:

Table 1. Number of staff interviewed at Jordanian academic libraries.

University library	Number of staff interviewed
University of Jordan	10
Jordan University of Science and Technology	7
Al-Balqa Applied University	6
Yarmouk University	4
Mu'atah University	3
The Hashemite University	3
Al al-Bayt University	3
Al-Hussein Bin Talal University	3
Tafila Technical University	2
German Jordanian University	3
Total	44

- The concept of business intelligence;
- Business intelligence application and use;
- The objectives of using business intelligence in academic libraries;
- The requirements to apply business intelligence tools in academic libraries;
- The anticipated effect of business intelligence on the environment of academic libraries; and
- The obstacles relating to the application of business intelligence in academic libraries in Jordan.

Thematic analysis

Thematic analysis is one of the most common methods used in the analysis of qualitative data (Braun and Clarke, 2012). The researcher organizes the data into specific topics or categories, and then explains and analyses it to find the answer to a research question. According to Terry et al. (2017), thematic analysis is a method used to identify and analyse the patterns of data-derived subjects. Thematic analysis is done by focusing on the commonalities of the data. It helps with understanding qualitative data that can seem ambiguous, confusing and very complex. It explains coding mechanisms and qualitative data analysis in a systematic manner, and can therefore be linked to broader theories or concepts (Terry et al., 2017).

According to Terry et al. (2017), thematic analysis involves a six-phase process: (1) *familiarization with the data* – reading and rereading the data to become immersed in the content and develop a sense of the overall data set; (2) *coding* – generating meaningful labels (codes) that identify important features of the data which might be relevant to answering the

research question (the coding process is iterative and flexible); (3) *generating initial themes* – examining the codes and collated data and collapsing them into more meaningful patterns of meaning (potential themes); (4) *reviewing the themes* – checking the candidate themes against the data set to determine if they tell a meaningful story which answers the research question (themes might be split, combined or discarded); (5) *defining and naming themes* – developing the analytic narrative that encases the presented data, or checking the clarity, cohesion and precision of the themes, and deciding on an informative name for each theme; and (6) *writing up* – weaving together the analytic narrative and data extracts, and contextualizing the analysis in relation to existing literature. The phases are sequential, where each phase builds on the previous phase. However, the analysis is a recursive process where the researcher sometimes needs to move back and forth between different phases.

In this research, thematic analysis was used as a tool to analyse the interview data. After conducting the interviews and gathering the required data and information, and based on the information collected, the researchers applied an inductive analysis methodology, where the answers for each question were collected together. For each question and its related answers, a set of keywords or ‘codes’ was first extracted. The codes were then transformed into ‘themes’.

During the process of coding, the frequency of each code was calculated in order to find the indicator of the answers of the questions. Then, for each code, the percentage and consensus of the participant on each code/paragraph during the coding process was calculated using the following formula:

$$\text{Percentage} = \frac{\text{number of answers indicating the code}}{\text{total number of answers}} \times 100\%$$

Results

The concept of business intelligence in academic libraries

The information department staff in the Jordanian university libraries showed a lack of understanding of the concept of business intelligence. Approximately 11.36% (5/44) of their answers gave a definition of business intelligence. One of the answers indicated that business intelligence is ‘a technology that converts metadata into useful information for decision-making within the library’. Another participant indicated that business intelligence is ‘an application that organizations use to control huge amounts

of information, invest it effectively, and use it to maintain the organization's competitive advantage' (Information division staff member). Another library staff member said: 'These are decision support systems that provide information to decision-makers to make decisions' (Information division staff member). All of the answers implied that business intelligence is

a set of software, applications, and analysis systems that collect and analyse data and information within an organization accurately using analysis systems and then store data in data warehouses to build a database to be consulted when needed and for strategic decisions. (Information division staff member)

Overall, it was found that some employees had heard of the term 'business intelligence' a long time ago and others had heard of it recently, while the majority heard of it during the interview (86%) when the researchers explained it to them. Information about some library activities such as the cost of business activities and database usage statistics is implemented within the library routine, but the staff do not realize that they are business intelligence practices.

One information division staff member from the Hashemite University library indicated that he heard of the term 'business intelligence' in 2015:

In 2015 I heard of the term BI [business intelligence] and some of these applications are active in the library of the Hashemite University, despite the lack of awareness of employees of the real name under which these applications are falling. BI are applied in the processes of book lending to know the most used books. Also by management as they need statistics that show the most used services. (Information division staff member)

One information division staff member indicated that he had heard of the concept of 'business intelligence' in 1996. He demonstrated an excellent knowledge of the topic and provided the researchers with a lot of information about business intelligence systems, their applications and the challenges involved in implementing such systems. When he was asked if he had heard of 'business intelligence' and what the term meant to him, he answered:

I have heard of business intelligence systems for a long time, and these systems have been implemented in the technical department to purchase books and office resources. BI is also used in the computer application department to track usage statistics for databases to decide on the feasibility of subscribing to databases to decide whether to renew subscriptions or not. It was also applied in the services department to track self-borrowing statistics, fines statistics, etc. These systems

help to make decisions that reflect on the library's success.

One library staff member from the University of Jordan stressed the importance of increasing the awareness of employees in Jordanian university libraries of the concept of business intelligence.

Application of business intelligence in academic libraries

The responses indicated that employing business intelligence systems may contribute to improving the performance of the library, increasing its competitive advantage. The answers indicated that business intelligence improves the quality of work, obtaining the best results using the least resources. It also improves the decision-making process and performance that reflects on individual behaviour. Business intelligence enhances the management process, resulting in more informed decisions and doing things the right way, saving time, effort and money.

The responses stressed the point that business intelligence collects, consolidates and stores data and information in a way to ensure the accuracy and usefulness of decision-making at all managerial levels. It improves decision engineering and rationalization, using modern technology to be more flexible and respond rapidly to changes in the environment. It also enables decision-makers to make the right decision at the right time, effectively and accurately:

These systems support the decision-maker to reach a clear decision about the situation where decision-making is needed. It facilitates decision-making because it provides very accurate information to the decision-maker to achieve an informed decision. (Library manager)

These systems help to improve the quality of work by providing accurate statistical reports of operations inside the library, so decisions are more informed and well driven. (Library manager)

The participants demonstrated that all of the academic libraries at Jordanian public universities use business intelligence in some of their operations. Business intelligence helps a library with acquisitions, in selecting library materials more accurately, and gives accurate statistics that ensure the appropriate selections. For instance, participants from the University of Jordan library stated that:

The library uses many different systems. It uses systems that support BI in some of its operations, such as lending statistics. These statistics show which books are in great

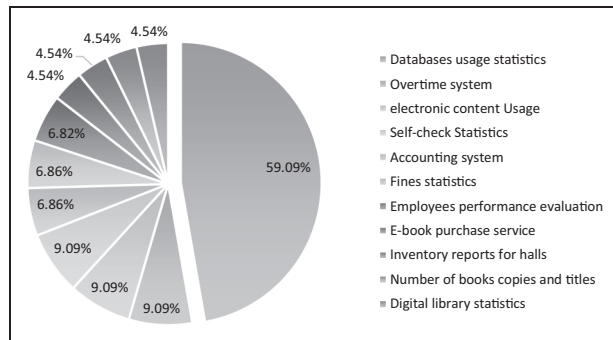


Figure 1. The application of business intelligence in academic libraries in Jordan.

demand and thus we provide them to satisfy users' needs. (Information division staff member)

[Business intelligence helps us to] understand data and information about resource usage. This will provide insights about users' information needs, so the library will work on satisfying the needs in different disciplines, different subjects, and so we can basically design an information supply model for our library. (Library manager)

The participants identified systems such as employee performance assessment systems, which measure the contribution of each worker to the added value of the library (Figure 1). Based on the evaluation information, decisions relating to promotion and motivation can be easily made. Also, business intelligence can provide information relating to determining financial reward based on performance. The overtime hours in each section are precisely determined, and the overtime allowance is minimized to reduce costs or decrease the number of staff in certain jobs that do not require specialized personnel in the field: 'We can keep track of employees' working hours and overtime to estimate their revenue. Also, employees' performance can be monitored and patterns of works can be detected. We can control employees and motivate them based on their performance' (Library manager).

One library staff member argued that business intelligence is used in accounting and thesis-browsing and usage within the library, and in detecting search patterns. It can gather users' information-seeking behaviour and customize their information needs and make personalized recommendations accordingly: '[the] system can keep record-users' usage data and customize messages and recommend some related information locally and from other sources of information' (Information division staff member). This member of staff also confirmed that these systems play a significant role in decision-making, such as providing statistics on the use of databases, where these statistics show the

number of users of the databases during a trial period. Based on the usage rate, the library makes the decision about subscription. Business intelligence also improves decisions about book purchases and determines the number of copies that should be available on the shelves based on the demand rate. Furthermore, the workload in each department and section can be determined, and then the number of staff required for each department, as well as overtime, can be established:

These systems are used in the accounting department via the library accounting system to give me the financial return for anything. It is also used to provide information about electronic content [thesis-] browsing and usage inside the library. (Information division staff member)

Decision-makers can get insights about the licenses, contracts that they sign with some of the providers and database subscriptions to make decisions based on usage data. (Information division staff member)

The participants identified a range of areas in which library business intelligence systems are implemented to achieve a set of library objectives. The real value of business intelligence is to help decision-makers so that they can make the most accurate decisions for the library:

The real goal of using business intelligence systems is to put the real picture in front of the decision-maker so that they can make the most accurate and useful decision for the library – also to speed up decision-making and facilitate operations. (Information division staff member)

Another participant pointed out that business intelligence can improve library operations and routines: 'The aim of using these systems is to speed up operations, reduce time, improve the performance of the library, and improve its services' quality and quantity' (Information division staff member). Further, business intelligence could also be used to increase the competitive advantage of the library: 'The real goal of implementing business intelligence systems is to achieve a competitive advantage for the library' (Information division staff member). Also, electronic library services can be made more effective by using business intelligence: 'These systems help the library to move towards the electronic library' (Information division staff member).

The participants identified some basic areas where business intelligence can be used to make appropriate decisions, including book purchases, database subscriptions and their feasibility, determining the nature of the work of the departments, identifying the needs of library staff, helping to develop and update library

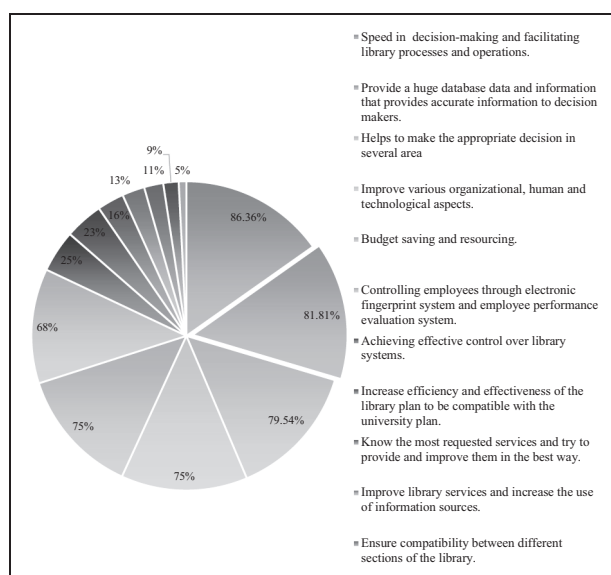


Figure 2. The objectives of using business intelligence systems in libraries in Jordan.

holdings, excellence in the provision of services and reduced paperwork. The library manager's control can also be facilitated through business intelligence tools: 'We can keep track of employees' working hours and overtime to estimate their revenue. Also, employees' performance can be monitored and patterns of works can be detected. We can control employees and motivate them based on their performance' (Library manager).

Therefore, the answers showed that business intelligence can be used in libraries for many reasons, chief among them being to accelerate decision-making and facilitate operations (86.36%). Other objectives that the participants pointed to are illustrated in Figure 2.

The impact of business intelligence systems on libraries

The participants pointed to the positive role of business intelligence tools in influencing decision-making in the library. They affirmed that business intelligence raises the efficiency of the performance of their daily work:

These systems lead to efficient and effective work delivery, as well as speed and accuracy in decision-making. (Library manager)

These systems have a positive impact by raising administrative efficiency and reducing the financial costs of projects or office updates. (Information division staff member)

The impact of the role of business intelligence tools on academic libraries can be summarized as shown in Figure 3.

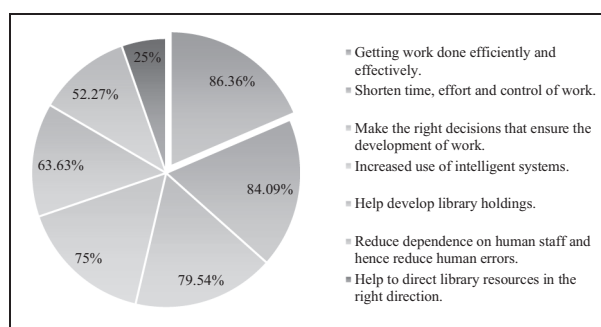


Figure 3. The impact of business intelligence systems on libraries in Jordan.

When the participants were asked about their perceptions with regard to the added value that business intelligence can contribute to academic libraries, they confirmed the need for an integrated system that is capable of providing information for accurate decision-making to improve the level of library services. Business intelligence is not only an information system, but also an interactive system that is able to interact with different library systems and functions.

The participants emphasized the role of business intelligence in changing library strategies and objectives based on accurate statistics that guide the work of the library to achieve its existing goals. They described business intelligence tools as an information bank that can be used to set the library's vision and mission to achieve its objectives, placing the library in an advanced position to compete with international libraries.

At the beginning of the study, the participants indicated a lack of understanding of business intelligence tools, despite their positions as computer application department staff. For example, only 11.4% of the participants were able to define business intelligence and what the concept means. However, as the interviews proceeded, and after the researchers had explained the concept, the participants were able to answer and discuss subsequent questions about business intelligence, indicating that they were using business intelligence tools in their libraries but were not aware of these applications' and practices' concepts. The main effect of business intelligence on libraries is to improve decision-making leading to strategic decisions, improve performance, save effort and money, and do work more intelligently.

Requirements for implementing business intelligence in academic libraries

The participants were asked about the requirements for implementing business intelligence in academic

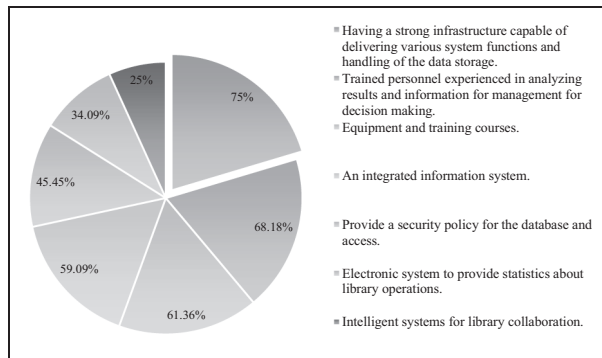


Figure 4. Requirements for implementing business intelligence in academic libraries in Jordan.

libraries (see Figure 4). Their answers indicated a set of requirements. One staff member confirmed the need to raise awareness at the managerial level about the importance of business intelligence in a library:

There must be an awareness by senior management of the importance of business intelligence systems and support for the adoption of these systems in the library (Information division staff member).

Another participant stressed the required infrastructure in terms of technological aspects:

The implementation of these systems requires modern hardware and specialized software licensed to work, as well as trained staff to use these applications (Information division staff member).

A third staff member answered that the overall environment of the library should be compatible with the adoption of business intelligence:

The application of these systems needs a different office environment, equipped in terms of construction, infrastructure, information sources, and human resources (Information division staff member).

Challenges to implement business intelligence system in libraries

The participants indicated several challenges that academic libraries face when they want to implement and use business intelligence in their library's routines (see Figure 5):

There are no special sections dealing with business intelligence operations, which leads to the allocation of the operations of BI to several departments, and this certainly leads to depletion of the workers' energy; also impediments to the implementation of business

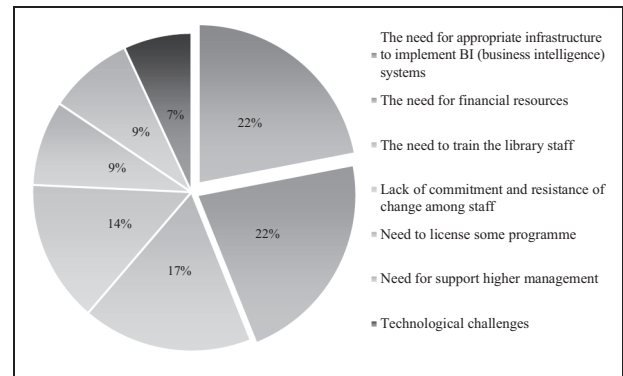


Figure 5. Challenges to implementing business intelligence in academic libraries in Jordan.

intelligence systems are the continuous change of departments, lack of awareness and interest of some departments in the application of these systems; the existence of departments far from technology. (Information division staff member)

The participants' responses pointed to a number of challenges, such as the appropriate technological infrastructure to implement business intelligence tools following developments that need to be kept up to date. Also, the staff's responses pointed to staff's competency to deal with advanced technologies such as analytics tools, visualisation and data curation as another major challenge: 'The lack of specialized human resources in this field and the fight against change by employees' (Information division staff member). The need for new skills is critical. The respondents indicated that libraries do not currently have staff who are competent in handling data analytics. In addition, staff's resistance to change is another challenge to consider:

[The] library profession is not only about classification and other technical skills. It is also knowing how to interact with information and customize your services to users' needs. (Information division staff member)

BI and analytics tools need competencies that almost all of the current staff lack. There is an urgent need to increase awareness about the benefits of BI so that library staff become familiar with it and accept it. (Information division staff member)

Financial resources are also one of the challenges that were addressed by the respondents. Financial support is needed for developing the library infrastructure and to provide training for library staff in utilizing business intelligence tools in the library environment. Also, there is a need for licenses for some programmes and for support for senior management at the university itself.

Discussion

Recent advances in information technology are forcing organizations and libraries to be innovative in utilizing technology and employing it for their competitive advantage. Data analytics and intelligence tools such as data visualization are gaining recognition for their significance in libraries (Murphy, 2013). Business intelligence is impacting academic libraries in many aspects, such as informed decision-making and innovative services increasing users' experiences. The results revealed a weak awareness of the concept of business intelligence among library staff in the Jordanian academic libraries. However, the participants indicated that there are systems that are used to gather and record information at different service levels, which might indicate a gap between theory and practice. As in this case, libraries are using intelligent systems but their staff are not fully aware of their names or the concepts under which they fall. For example, one respondent identified that information about some library activities, such as the cost of business activities and database usage statistics, was implemented within the library routine, but the staff did not realize that they were business intelligence practices. This indicates the need for workshops and training sessions to increase awareness of new technological advancements in the field.

Most of the comments in the interviews focused on the impact of business intelligence on both library management decision-making and the evaluation of library services to make informed decisions based on data. This indicated that business intelligence can contribute to improving library performance and result in an increased competitive advantage. Business intelligence can improve the quality of work, decision-making processes and performance at both the managerial and individual levels. Business intelligence collects, organizes, and makes data and information available for decision-makers within an organization (Phillips-Wren et al., 2015).

It appears that all of the academic libraries at Jordanian public universities use business intelligence in some of their operations. For example, business intelligence helps libraries with acquisitions to select library materials more accurately, and gives accurate statistics that ensure the appropriate selection. The process of acquisition becomes more informed as the decision is made based on usage data and usage patterns and behaviours. Accordingly, business intelligence can help with financial estimates for annual budget analyses. In the same context, Chen and Zhang (2014) argued that the effective use of analytics tools such as business intelligence has the underlying

benefit of transforming economies and delivering a new wave of productive growth. Also, Daniel (2015) pointed out that business intelligence can influence academic libraries' practice, from enhancing users' experience to improved library services, more effective evidence-based decision-making, and strategic responses to changing global trends. According to Phillips-Wren et al. (2015), business intelligence, decision support and analytics are essential to making business decisions in many organizations. Li et al. (2019) reported on the need to use big-data methods for improvement and innovation in library services, and stressed the importance of user-behaviour data, including reading habits, for resource utilization. Also, Al Shawabkeh (2018) affirmed that big-data application in academic libraries can help in improving the existing library services or creating new services, and hence improve decision-making.

Furthermore, employees' performance assessment can be made more accurate and informed based on their logs and activities. For instance, when there is a need for employees' deployment, reallocation and rewards, business intelligence can direct library management to the correct decision. Moreover, it is always important to understand users' needs and information-seeking behaviour. Accordingly, business intelligence can detect search patterns and thesis-browsing within the library. So, business intelligence gathers user information and customizes services that satisfy information needs, and makes personalized recommendations accordingly. This is in alignment with the results of Li et al. (2019), which also emphasized that user interaction information is important for creating clear predications of users' behaviours and needs.

The participants also identified some objectives for using business intelligence in the academic library environment. The objectives are aligned with the applications of business intelligence in academic libraries. For instance, the real value of business intelligence is to help decision-makers, so that they can make the most accurate decision for the library. For example, business intelligence should be used in areas such as book purchases, database subscriptions and their feasibility, determining the nature of the work of the departments, identifying the needs of library staff, helping to develop and update library holdings, excellence in the provision of services and reduced paperwork. Business intelligence increases the efficiency of doing daily work. Bronzo et al. (2013) and Vukšić et al. (2013) showed that business intelligence leads to enhancing overall organizational performance. Kumar and Priyadarsini (2016) and Al-Barashdi and Al-Karousi (2019) confirmed that data

analytics help libraries to enhance the quality of their services, as they are harnessing data for more informed planning and decision-making. The participants emphasized that business intelligence is changing library strategies and objectives based on accurate statistics (82%) that guide the work of the library to achieve its existing goals. Business intelligence tools in libraries are considered as information banks that can be used to set the library's vision and mission to achieve its objectives.

Raising awareness at the managerial level about the importance of business intelligence in libraries is required to implement business intelligence in academic libraries. Increasing awareness among the library staff is required as well. The results point to an appropriate infrastructure as a requirement and a challenge at the same time. Other challenges are staff's competency to deal with advanced technologies such as analytics tools, visualization and data curation, and staff's resistance to change. The basic competition for today's enterprises will be data competency (Chen and Zhang, 2014; Federer, 2016). Wang et al. (2016) also raised the point that libraries need data scientists who are able to understand users' data interaction, analytics and data visualization. Wang et al. (2016) affirmed this point, stating that the ability of librarians to manage information related to big data is not adequate, and that short-course training might not be sufficient.

Sufficient financial support is also important for developing libraries' infrastructure and to provide training for library staff to utilize business intelligence tools in the library environment. Licenses for some programmes and support from higher management at the university itself were raised as other challenges. There are also questions about whether libraries have the capacity to respond to technological advancements and utilize technology to increase their competitive advantage. For example, Wang et al. (2016) affirmed that although libraries understood the great benefits of big-data analytics, they had not invested enough in their information technology infrastructure, such as analytics servers and high-performance computing.

All of the participants' answers confirmed the importance of business intelligence within the library context. They stressed the point that business intelligence plays an important role in library management and decision-making processes. For instance, it provides statistics on users and on the use of the library's collection, in addition to usage patterns. This helps in making decisions on the development of the library's collection. Based on an understanding of user behaviour and interaction, libraries can gain a broader

perspective on the construction of data resources (Li et al., 2019). This is in alignment with the results of other researchers (Chen and Zhang, 2014; Federer, 2016), who found that librarians use data to provide institutional decision-makers with strategic information about the library's return on investment. Overall, business intelligence improves decision-making and rationalization, using modern technology to be more flexible and respond rapidly to changes in the environment. It also enables decision-makers to make the right decisions at the right time, effectively and accurately.

One interesting finding was that the Internet of things was not mentioned, although business intelligence can benefit from some of the data that is gathered about library halls and resource utilization, which might strongly relate to library provision of library space. It seems that business intelligence is partly utilized in academic libraries and that these libraries are still not fully aware of its fullest potentials. This indicates the need for serious training and workshops to bring this to the attention of library managers and section directors, as, in today's environment, smart decisions and smart libraries are vital.

Conclusion

Business intelligence is not utilized as a concept in academic libraries, although these libraries are using intelligent systems and employing intelligence aspects in their daily routines. This research was able to establish a good understanding from information technology department staff at different academic libraries in Jordan. Their responses indicated that business intelligence provides information about some library activities, such as the cost of business activities, and database usage statistics are already implemented within the libraries' routine. Moreover, business intelligence has an impact on both library management decision-making and the evaluation of libraries' services to make informed decisions based on data. Business intelligence can contribute to improving library performance and results with an increased competitive advantage. Business intelligence can improve the quality of work, the decision-making process, and performance at both the managerial and individual levels. In other words, business intelligence provides the possibility for fully understanding the interactions of library users in order to meet their information needs and provide user-oriented services. The results indicated the need to increase awareness at the managerial level about the importance of business intelligence in libraries. Also, there is a need for workshops and training sessions to

increase awareness of business intelligence and increase staff competencies to deal with the analytics tools, visualization and data curation, and reduce staff's resistance to change. Financial support appeared to be a challenge that needs attention by higher management in order to provide training for library staff and programme licensing to utilize business intelligence tools. This also means that libraries need to invest enough in their information technology infrastructures, such as analytics servers and high-performance computing, in order to fully expand their business intelligence capabilities. Based on these research results, academic libraries in general, and specifically Jordanian academic libraries, need training and workshops to utilize business intelligence in the library environment, a more developed infrastructure and tools for handling business intelligence appropriately. Financial and budgetary issues are also an urgent issue that needs attention. Further studies are required to investigate and understand the set of skills that are needed by librarians in the big-data era where business intelligence analytics are a decision-making tool. It is also important to investigate how to utilize the Internet of things in business intelligence, and hence in decision-making processes at academic libraries.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

ORCID iD

Faten Hamad  <https://orcid.org/0000-0001-7548-0529>

References

- Al-Barashdi H and Al-Karousi R (2019) Big data in academic libraries: Literature review and future research directions. *Journal of Information Studies and Technology* 2: 13. <https://doi.org/10.5339/jist.2018.13>.
- Al Shawabkeh Y (2018) Awareness of the concept of big data for academic librarians: A case study of the University of Jordan library. In: *24th annual conference and exhibition of the Special Library Association, Arabian Gulf Chapter*, Muscat, Oman, 6–8 March 2018.
- Audzeyeva A and Hudson R (2016) How to get the most from a business intelligence application during the post implementation phase? Deep structure transformation at a UK retail bank. *European Journal of Information Systems* 25(1): 29–46.
- Bailey K and Francis M (2008) Managing information flows for improved value chain performance. *International Journal of Production Economics* 111(1): 2–12.
- Balachandran BM and Prasad S (2017) Challenges and benefits of deploying big data analytics in the cloud for business intelligence. *Procedia Computer Science* 112: 1112–1122.
- Barton D and Court D (2012) Making advanced analytics work for you. *Harvard Business Review*. Available at: <https://hbr.org/2012/10/making-advanced-analytics-work-for-you> (accessed 5 November 2019).
- Braun V and Clarke V (2012) Thematic analysis. In: Cooper H, Camic PM, Long DL, et al. (eds) *APA Handbook of Research Methods in Psychology, Volume 2: Research Designs: Quantitative, Qualitative, Neuropsychological, and Biological*. Washington, DC: American Psychological Association, 57–71.
- Bronzo M, De Resende PTV, De Oliveira, et al. (2013) Improving performance aligning business analytics with process orientation. *International Journal of Information Management* 33(2): 300–307.
- Chen CLP and Zhang CY (2014) Data-intensive applications, challenges, techniques and technologies: A survey on big data. *Journal of Information Sciences* 275: 314–347.
- Chen X and Siau K (2011) Impact of business intelligence and IT infrastructure flexibility on competitive performance: An organizational agility perspective. In: *32nd international conference on information systems*, Shanghai, China, 4–7 December 2011.
- Daniel B (2015) Big data and analytics in higher education: Opportunities and challenges. *British Journal of Educational Technology* 46(5): 904–920.
- Dudycz H, Korczak J, Nita B, et al. (2017) Design of financial assessment scenarios of small and medium enterprises. In: *World library and information congress: 83rd IFLA general conference and assembly*, Wrocław, Poland, 19–25 August 2017.
- Duggal PS and Paul S (2013) Big data analysis: Challenges and solutions. In: *International conference on cloud, big data and trust*, Bhopal, India, 13–15 November 2013.
- Fan W and Bifet A (2013) Mining big data: Current status, and forecast to the future. *ACM SIGKDD Explorations Newsletter* 14(2): 1–5.
- Federer L (2016) Research data management in the age of big data: Roles and opportunities for librarians. *Information Services and Use* 36(1–2): 35–43.
- Fernandez P (2016) ‘Through the looking glass: Envisioning new library technologies’ understanding artificial intelligence. *Library Hi Tech News* 33(3): 20–23.
- Gartner (2019) IT glossary. Available at: <https://www.gartner.com/it-glossary/business-intelligence-bi/> (accessed 5 November 2019).
- Hamad F, Hamarsha A and Al Khalaila M (2018) Big data and analytics strategies in academic libraries: Opportunities and challenges, the case of the University of Jordan library. In *24th annual conference and exhibition of the Special Library Association, Arabian Gulf Chapter*, Muscat, Oman, 6–8 March 2018.

- Hilbert M (2013) Big data for development: From information- to knowledge societies. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2205145
- Höchtel J, Parycek P and Schöllhammer R (2016) Big data in the policy cycle: Policy decision making in the digital era. *Journal of Organizational Computing and Electronic Commerce* 26(1–2): 147–169.
- Hodges D, Preston C and Hamilton MJ (2010) Patron-initiated collection development: Progress of a paradigm shift. *Collection Management* 35(3–4): 208–221.
- IFLA Big Data Special Interest Group (2016) More about the Big Data Special Interest Group. Available at: <https://www.ifla.org/about-big-data> (accessed 15 November 2018).
- Iwu-James J, Haliso Y and Ifijeh G (2020) Leveraging competitive intelligence for successful marketing of academic library services. *New Review of Academic Librarianship* 26(1): 151–164.
- Jaklič J, Grublješič T and Popovič A (2018) The role of compatibility in predicting business intelligence and analytics use intentions. *International Journal of Information Management* 43: 305–318.
- Kowalczyk M and Buxmann P (2015) An ambidextrous perspective on business intelligence and analytics support in decision processes: Insights from a multiple case study. *Decision Support Systems* 80: 1–13.
- Kumar P and Priyadarsini U (2016) Revealing library statistics with big data expertise: A review. *International Journal of Pharmacy and Technology* 8(4): 20783–20789.
- Larson D and Chang V (2016) A review and future direction of agile, business intelligence, analytics and data science. *International Journal of Information Management* 36(5): 700–710.
- Li S, Jiao F, Zhang Y, et al. (2019) Problems and changes in digital libraries in the age of big data from the perspective of user services. *Journal of Academic Librarianship* 45(1): 22–30.
- Loebbecke C and Picot A (2015) Reflections on societal and business model transformation arising from digitization and big data analytics: A research agenda. *Journal of Strategic Information Systems* 24(3): 149–157.
- Macy KV and Coates HL (2016) Data information literacy instruction in business and public health: Comparative case studies. *IFLA Journal* 42(4): 313–327.
- Majid S and Khoo C (2009) Environment intelligence: An innovative information service. *Singapore Journal of Library and Information Management* 38: 13–26.
- Miller MR, Wissotzky H, Goore N, et al. (2013) *US Patent No. 8,571,909*. Washington, DC: US Patent and Trademark Office.
- Murphy SA (2013) Data visualization and rapid analytics: Applying Tableau Desktop to support library decision-making. *Journal of Web Librarianship* 7(4): 465–476.
- Nam D, Lee J and Lee H (2019) Business analytics use in CRM: A nomological net from IT competence to CRM performance. *International Journal of Information Management* 45: 233–245.
- Negash S (2004) Business intelligence. *Communications of the Association for Information Systems* 13(1): 177–195.
- Nfila RB (2009) Innovative system and generation of management and operation statistics for decision making in academic libraries: The case of the University of Botswana library. In: *World library and information congress: 75th IFLA general conference and assembly, Milan, Italy, 23–27 August 2009*.
- Olszak CM (2013) The business intelligence-based organization: New chances and possibilities. In: *Proceedings of the international conference on management, leadership and governance: ICMLG 2013* (ed. Ribiere V and Worasinchai L), Bangkok, Thailand, 7–8 February 2013, pp. 242–249. Reading: Academic Conferences and Publishing International.
- Olszak CM (2016) Toward better understanding and use of business intelligence in organizations. *Information Systems Management* 33(2): 105–123.
- Peltier-Davis CA (2011) Overview of library services in the English-speaking Caribbean: Management, innovative services and resource sharing. In: *World library and information congress: 77th IFLA general conference and assembly, San Juan, Puerto Rico, 13–18 August 2011*.
- Phillips-Wren GE, Iyer LS, Kulkarni UR, et al. (2015) Business analytics in the context of big data: A roadmap for research. *Communications of the Association for Information Systems* 37: 23. Available at: <https://aisel.aisnet.org/cais/vol37/iss1/23>.
- Ranjan J. (2009). Business intelligence: Concepts, components, techniques and benefits. *Journal of Theoretical and Applied Information Technology*, 9(1), 60–70.
- Reinhalter L and Wittmann RJ (2014) The library: Big data's boomtown. *Serials Librarian* 67(4): 363–372.
- Russom P (2011) *Big data analytics*. TDWI Best Practices Report. Renton, WA: TDWI.
- Sharma R, Mithas S and Kankanhalli A (2014) Transforming decision-making processes: A research agenda for understanding the impact of business analytics on organisations. *European Journal of Information Systems* 23: 433–441.
- Stachowiak R, Rayman J and Greenwald R. (2007) *Oracle Datawarehousing and Business Intelligence Solutions*. Indiana: Wiley Publishing.
- Stone G and Ramsden B (2013) Library Impact Data Project: Looking for the link between library usage and student attainment. *College and Research Libraries* 74(6): 546–559.
- TechAmerica Foundation Federal Big Data Commission (2012) Demystifying big data: A practical guide to transforming the business of government. Available at: https://bigdatawg.nist.gov/_uploadfiles/M0068_v1_3903747095.pdf (accessed 15 November 2018).
- Terry G, Hayfield N, Clarke V, et al. (2017) Thematic analysis. In: Willig C and Stainton Rogers W (eds) *The*

- SAGE Handbook of Qualitative Research in Psychology*. London: SAGE, 17–37.
- Thomas A and Brown S (2019) The academic library as a university research business intelligence partner. In: *40th IATUL conference*, Perth, Australia, 23–27 June 2019. Available at: <https://docs.lib.purdue.edu/iatul/2019/value/1>
- Thorpe A, Lukes R, Bever D, et al. (2019) The impact of the academic library on student success: Connecting the dots. *Libraries and the Academy* 16(2): 373–392.
- Vukšić VB, Bach MP and Popović A (2013) Supporting performance management with business process management and business intelligence: A case analysis of integration and orchestration. *International Journal of Information Management* 33(4): 613–619.
- Wang C, Xu S, Chen L, et al. (2016) Exposing library data with big data technology: A review. In: *2016 IEEE/ACIS 15th international conference on computer and information science*, Okayama, Japan, 26–29 June 2016.
- Wilson B (2008) Accelerating relevance. In: Hiller S, Justh K, Kyrilladou M, et al. (eds) *Proceedings of the 2008 Library Assessment Conference: Building Effective, Sustainable, Practical Assessment*. Seattle, WA: Association of Research Libraries, 13–15.
- Xu X, Wang X, Li Y, et al. (2017) Business intelligence in online customer textual reviews: Understanding consumer perceptions and influential factors. *International Journal of Information Management* 37(6): 673–683.
- Zhang Y, Oussena S, Clark T, et al. (2010) Using data mining to improve student retention in HE: A case study. In: *12th international conference on enterprise information systems*, Funchal, Madeira, Portugal, 8–12 June 2010.

Author biographies

Dr Faten Hamad is an associate professor and Head of department at the Library and Information Science Department, University of Jordan. She is specialized in computer science and information science. Her research interests include information retrieval and big data, data science, social media, health informatics, optimization, and services. She published book titled: *Information Systems: Process and Practice*, 2018.

Dr Hussam Fakhouri is Holds a PhD in computer Science major in Artificial Intelligence. His primary area of expertise is Swarm Intelligence and Artificial Intelligence. His main research interest is developing new metaheuristics for solving optimization problems. His other research includes image processing, information and data science, machine learning, network and security.

Professor Sinaria Jabbar, faculty member and Head of department at the Educational Leadership and Foundations Department at The University of Jordan. Her research interests include leadership, women empowerment, youth empowerment and refugee studies.

Research data management in Turkey: A survey to build an effective national data repository

International Federation of
Library Associations and Institutions
2021, Vol. 47(1) 51–64
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0340035220917985
journals.sagepub.com/home/iff



Guleda Dogan

Department of Information Management, Hacettepe University, Ankara, Turkey

Zehra Taskin 

Department of Information Management, Hacettepe University, Ankara, Turkey
Scholarly Communication Research Group, Adam Mickiewicz University, Poznan, Poland

Arsev Umur Aydinoglu

Science and Technology Policy Studies, Middle East Technical University, Ankara, Turkey

Abstract

Research data management is an important topic for funding agencies, universities and researchers. In this context, the main aim of this study is to collect preliminary information for Aperta, which is being developed by the Scientific and Technological Research Council of Turkey, to fulfil the following goals: determine the research data management awareness levels of researchers in Turkey; understand current research data management practices in their research environments; and find out their experiences of policy issues. For this, a questionnaire was distributed to 37,223 researchers, with 1577 researchers completing it. The results indicated that researchers who spend more time with data have more concerns about data management issues. The levels of experience of creating a data management plan were quite low. The importance of this study lies in how it is able to show the current research data management practices of Turkish scholars during the new repository's foundational development stage.

Keywords

Data services, services to user populations, research data management, data repository, Turkey, data practices, open data

Introduction

The deluge of data in recent decades has not only created great opportunities for scientists but also the challenge of managing enormous amounts of information. Discovering, accessing, storing, migrating, integrating and reusing data has become easier and more common. Hence, research data management (RDM), which concerns the organization and dissemination of data (Whyte and Tedds, 2011), has become an important topic for all stakeholders involved in research. It includes 'the organization, storage, preservation, and sharing of data' (University of Pittsburgh, 2020). It has become both an opportunity (Royal Society, 2012) and a challenge (McAfee and Brynjolfsson, 2012; Pinfield et al., 2014) for research organizations.

Many researchers, funders and countries that understand the importance of RDM are taking important steps in this regard and carrying out their studies in this direction. For researchers and funding agencies in Turkey, the biggest problem concerns the awareness of and attitudes towards RDM practices. Up until 2019, there was a dearth of encouragement for researchers or a lack of drive to enforce guidelines regarding RDM from national funding agencies. However, researchers who are involved in the Horizon 2020 grant scheme are required to submit RDM

Corresponding author:

Zehra Taskin, Adam Mickiewicz University in Poznań,
Międzychodzka 5, 60-371 Poznań, Poland.
Email: zehrayanar@gmail.com

plans within six months after their project has been funded, like any other grantee in Europe. Even though some researchers are aware of the benefits of RDM, they lack institutional support, have limited knowledge and technical skills, or are scared of falling victim to unethical practices, such as being scooped (Allard and Aydinoglu, 2012; Aydinoglu et al., 2017; Ünal and Kurbanoğlu, 2018). Much needs to be done to address the problem, but at least those at the highest level are now showing commitment.

The head of the main funding agency in Turkey, the Scientific and Technological Research Council of Turkey (TÜBİTAK), announced its commitment to open the data gathered during the 6th Turkey Open Science Summit, held in 2018. In 2019, TÜBİTAK announced its 'Open science policy', covering publications and research data that are produced through TÜBİTAK funding (TÜBİTAK, 2019). It recommends 'establishing a research data management plan for open access to research data' and 'providing open access to publications along with research data', and also commits to preparing templates and guidelines for data management plans (TÜBİTAK, 2019: 3–4). Moreover, an institutional repository, named Aperta, has been created (Aperta TÜBİTAK, 2019) and an RDM training portal (Araştırma Verileri Yönetimi, 2019) has been prepared. TÜBİTAK aims to provide open access to the output of all kinds of funded projects, including research data and publications funded by TÜBİTAK's Support Program of International Scientific Publications, TÜBİTAK-addressed publications, articles published in TÜBİTAK academic journals and related research data (Aperta TÜBİTAK, 2019). On the other hand, the training portal provides templates, guidelines and videos to researchers in need of training on RDM (Araştırma Verileri Yönetimi, 2019). The active initial steps that were taken by the country's main funding body may function as an accelerator regarding RDM and open research data in Turkish universities. In such an important process, this study aims to provide information regarding the RDM behaviours of Turkish scholars, which would help in the design of not only Aperta but also other data repositories.

Literature review

RDM offers several opportunities not only to researchers but also to the scientific enterprise and society in general. For researchers, because 'proper data management is also a key prerequisite for effective data sharing' (Sesartic and Dieudé, 2017), one advantage is increased visibility for their research and, consequently, greater opportunities for their

publications to receive more citations (Herold, 2015). This is because of evidence that points to how studies which are made available receive more citations than similar studies which do not (Fecher et al., 2015; Ioannidis et al., 2009; Piwowar et al., 2007; Piwowar and Vision, 2013; Spires-Jones et al., 2016). As for science in general, RDM helps in identifying questionable research ethics and dealing with the reproducibility crisis that has plagued science (John et al., 2012; Roettger et al., 2019). The integration and reuse of data spells the introduction of new methods and better science (Fecher et al., 2015; Tenopir et al., 2011; Xia et al., 2017).

However, challenges remain. Research suggests that, despite all the efforts on the part of the scientific community, data-sharing still tends to occur through personal exchanges (Fecher et al., 2015; Ferguson et al., 2014; MacMillan, 2014; Wallis et al., 2013). Policymakers have been encouraging researchers to share their research data and, in general, to have better data management practices. For instance, different funding agencies in the USA have adopted RDM policies into their grant schemes (NASA, 2011; National Institutes of Health, 2008; National Science Foundation, 2010), and Europe has followed (European Commission, 2016). Higman and Pinfield (2015) looked at the adoption of data management practices in higher education institutes and found that successful cases could be attributed to large research funders. Despite enviable open access data-sharing practices, challenges persist. The fMRI Data Center for the neuroimaging community is a good example (Mennes et al., 2013; Poldrack et al., 2017). Sociocultural problems in ecology continue to hinder scientific advancement as well (Hardisty et al., 2013). Dental research is plagued by similar concerns, despite an environment of positive attitudes towards data-sharing (Spallek et al., 2019). A recent survey conducted among earth and planetary geophysicists found that scientists are aware of the benefits of sharing their research data; however, they are concerned about data misuse and the risk of not receiving credit for their data sets (Tenopir et al., 2018). Data misuse as a concern for sharing data has appeared in different surveys (Aydinoglu et al., 2017; Bertzky and Stoll-Kleemann, 2009; Cragin et al., 2010; Elsayed and Saleh, 2018).

The management of research data creates an opportunity for library and information science practitioners and scholars. For academic institutions, university libraries play a critical role not only in managing research data but also in training the next generation of researchers to be well versed in data management practices (Koltay, 2019; Tenopir et al., 2016). There exists a knowledge gap among scientists

that can easily be addressed by these professionals (Steeleworthy, 2014; Strasser and Hampton, 2012; Tenopir et al., 2017; Verbakel et al., 2013).

Several researchers are of the opinion that incentives for researchers can be a solution to the socio-cultural barriers preventing data-sharing in the sciences (Ioannidis et al., 2014; Koole and Lakens, 2012; Michener, 2015; Nosek et al., 2012). Data sets can be cited and counted in National Science Foundation grant applications as long as they are citable and accessible (Piwowar, 2013). Attitudes towards data-sharing differ among scientists depending on their academic discipline (Tenopir et al., 2011, 2015a) or which sectors they belong to, such as academia or industry (Pollock, 2016). Even within a discipline, developments over time may have changed the atmosphere and attitudes of scientists, such as in the case of medical science, which has traditionally been conservative regarding data-sharing (Tenopir et al., 2011) but is now moving in the opposite direction (Yegros-Yegros and Van Leeuwen, 2019).

Data citation is not the only thing researchers consider when it comes to RDM. Tenopir et al. (2011) conducted an international survey of researchers from different disciplines to explore current practices in, and perceptions towards, data-sharing and found that scientists do not make their research data available or receive institutional support, and are willing to share their data only if certain conditions are met. A follow-up study (Tenopir et al., 2015b) to observe changes (if any) regarding data-sharing was conducted with regard to how many funding agencies made data management plans mandatory for their grantees and how awareness had increased. As well as an increase in acceptance and willingness to engage in data-sharing, actual data-sharing behaviours also saw a spike. However, with greater awareness, risk perception among the participants had also spiked, as barriers remained. Other surveys have found similar results (Aydinoglu et al., 2014, 2017; Grootveld et al., 2018; Kratz and Strasser, 2015; Whitmire et al., 2015).

There have been a limited number of studies investigating RDM practices in Turkey. A nationwide survey found that the concept of RDM did not exist in open access policy papers (Tonta, 2012, 2013). The studies so far have focused on researchers' attitudes towards and practices of RDM and data-sharing: Allard and Aydinoglu (2012) investigated data-sharing practices among environmental scientists; Aydinoglu et al. (2017) examined the RDM behaviours of academics at research-intensive universities in Turkey; and Ünal and Kurbanoglu (2018) researched attitudes towards RDM. A recent study

by Ünal et al. (2019) compared scholars from Turkey to those in France and the UK and found that there are big differences in data behaviours such as 'the use of data from outside sources', 'expectations for funding for data storage and open access' and 'concerns for sharing their data'. It is important to have a better understanding of scholars' data behaviours in comparison with each other as they collaborate frequently and what to do with the data comprises a large part of collaboration. Considering that the TÜBİTAK 'Open science policy' is in effect and Aperta has been introduced for researchers, it has become imperative to establish a baseline for Turkish scholars' RDM behaviours in order to understand the mid- and long-term effects of the policy and archive. Therefore, this study is designed to understand the RDM behaviours of the target audience of TÜBİTAK funding – active researchers who have received funding from TÜBİTAK – by addressing the following research questions:

- What is the level of use, production and citing of research data for researchers in Turkey? Do these practices differ by academic title and field of study?
- What are the most common data types and data formats used in research? Is there a difference between fields according to the data types or formats used?
- What is the size of the data used in research? Is the field of study a determinant of the data size used?
- Where is the research data stored? Does the environment for data storage differ by academic title and field of study?
- Do researchers support open access to research data? What are their experiences in preparing a data management plan? How are the approaches of researchers for TÜBİTAK making data open and a data management plan mandatory for funded projects? Does the approach of researchers differ by field and title?
- What is the need for training on RDM? Does the need differ by title and field of study?

Methodology

TÜBİTAK ULAKBİM (the Turkish Academic Network and Information Center) sent a questionnaire to 37,223 researchers registered to ARBİS (TÜBİTAK's researcher information system) to gather the preliminary information for Aperta, mainly on RDM-related issues (see Appendix 1). ARBİS, which has been designed and developed by TÜBİTAK, is an updated

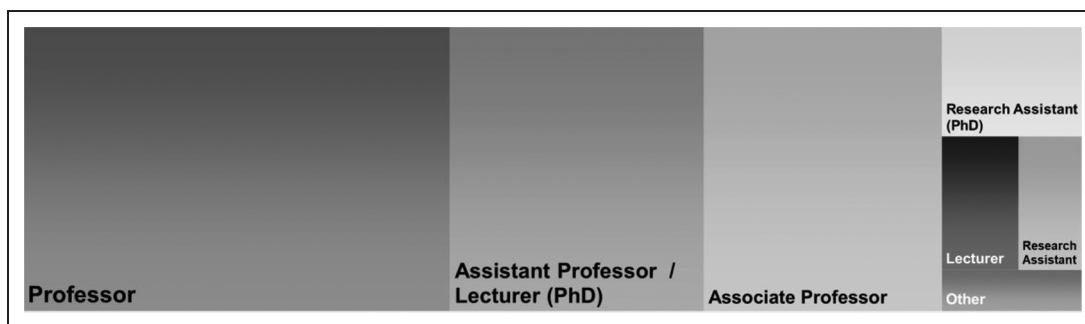


Figure 1. Distribution of respondents by title (%).

database to hold information about researchers. The researchers who have registered to ARBİS are able to apply for TÜBİTAK scholarship and support programmes, or serve as evaluation and monitoring phases for the submitted proposals (ARBİS, 2019). ARBİS is one of the biggest researcher repositories in Turkey. On the other hand, since Aperta is aimed at researchers who conduct or evaluate projects for TÜBİTAK, only scholars registered to ARBİS are included in the research. The questionnaire was distributed online by TÜBİTAK ULAKBİM through LimeSurvey and remained open for three weeks between 27 April and 17 May 2018.

The questionnaire, which consisted of 19 questions, was answered by 1577 researchers during this period. The researchers were asked questions, for example, about their research data usage and production; the types, formats and size of the data they used or produced; and the environment in which they stored their research data. The aim was to reveal trends and the behaviours and thoughts of the researchers, as well as to determine the knowledge levels and educational needs of the researchers.

The participants were asked three initial questions about whether they had used, produced and cited research data before. Since these three questions were not answered in 269 of the returned questionnaires, the analysis was based on 1308 returned questionnaires (1577 – 269), where the participants answered these initial questions.

According to Formula 1 and Formula 2 (Cochran, 1963: 75), a population of 37,223 can be represented by a sample of 1736 for $e = 0.04$ and by a sample of 996 for $e = 0.03$, both at the 99% confidence level ($z = 2.56$; $p = 0.5$; $q = 0.5$). Based on this information, it is possible to say that our sample represents the population at a 99% confidence level.

$$n_0 = \frac{z^2 pq}{e^2} \quad (\text{Formula 1})$$

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}} \quad (\text{Formula 2})$$

In Formula 1 and Formula 2, N is the population size; n_0 is the sample size; n is the corrected sample size; z is the Z-table score for the selected confidence interval; p is the estimate of variance; q is $1 - p$; and e is the desired level of precision.

SPSS (version 21.0) was used for the analysis of the results, and Excel was used to generate the graphs. In addition to descriptive statistics, cross-tables and chi-squared tests were used to reveal the differences according to fields and titles. Interpretations were made based on percentages (row percentages) by field and title to prevent the results from being affected by frequency by field or title. In addition to the comparisons made based on the fields and titles, several comparisons were made to determine whether there was a difference between those who used/produced and did not use/produce research data according to their approach to open data and RDM.

Findings

Respondents' general information

The distribution of the 1308 respondents covered in the analysis according to their field of study showed that 27% were in engineering, 24% in science, 21% in medical and health sciences, 18% in the social sciences and humanities, and 9% in agricultural sciences. Fifteen respondents did not specify their field of study. Figure 1 shows the distribution by title. The majority – around 40% – were Professors, followed by Associate Professors (22.5%) and Assistant Professors/Lecturers with a PhD (24%). These three groups accounted for approximately 87% of the respondents, with the remaining 13% consisting of Lecturers without a PhD (3.4%), Research Assistants with a PhD (5.1%) and Research Assistants in the process of postgraduate education (2.8%).

RDM awareness levels of Turkish scholars

The research data usage rate of the participants was about 83%. Approximately 73% of the participants

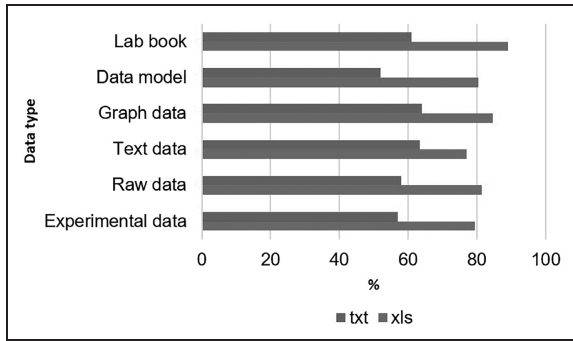


Figure 2. Use of xls and txt data formats by most commonly used data types (%).

said that they had cited research data before, and the option ‘I did not know that data could be cited’ was not selected by anyone. A group of approximately 71% of the participants said that they produced their research data (Figure 2). The tendencies of the researchers to use, produce and cite research data were also examined based on the field of study and title of the researcher. While the percentage of researchers who stated that they used research data was higher than 77% for all five fields of study, the highest percentages were observed in the medical and health sciences (91%) and agricultural sciences (90%). A similar trend was observed in producing and citing research data. Medical and health sciences (83% and 76%, respectively) and agricultural sciences (76% and 83%, respectively) were the two fields of study that exhibited the highest rates of producing and citing research data. The social sciences and humanities had the lowest rates of producing (63%) and citing (68%) research data. The titles of the researchers were divided into four groups – (1) Professor; (2) Associate Professor; (3) Assistant Professor and Lecturer with or without a PhD; and (4) Research Assistant with or without a PhD and Other – and comparisons by title showed that there was no statistically significant difference in terms of the title in all three aspects of the researchers’ involvement with research information: using research data: $\chi^2_{(3)} = 6.121, p = 0.106$; citing research data: $\chi^2_{(3)} = 7.706, p = 0.052$; and producing research data: $\chi^2_{(3)} = 1.012, p = 0.798$. The percentages of researchers who stated that they produced (70%–74%), used (79%–85%) and cited research data (68%–76%) were found to be close for all four title groups.

Commonly used data types and formats

The most commonly produced or used data type was found to be experimental data (50%), indicated by one in every two participants. The next most commonly

Table 1. Distribution of used or produced data types.

Data type	%
Experimental data	50.1
Text data	23.9
Survey data	22.5
Graphical data	22.2
Raw data	13.1
Lab books	10.9
Data model	8.9
Audio recording	5.1
Video	4.3
Remote-sensing data	3.3

Note: Multiple options could be selected for this question.

used or produced data type was text data (24%), followed closely by survey data (22.5%) and graphical data (22%). It would not be wrong to say that these three data types were produced or used by approximately one in four participants (Table 1). In exploring how the data formats used differed according to field, it was found that the most important difference was in the use of experimental data ($\chi^2_{(4)} = 139.577, p = 0.000$). The most significant reason for this difference is that the use of experimental data was seen in 67% of researchers in the medical and health sciences and 54%–58% of researchers in engineering, science and agricultural sciences, whereas it was used by only 17.4% of researchers in the social sciences and humanities. Contrary to experimental data use, the highest rate of raw data use, although not of the same significance, was found in the social sciences and humanities (21%). The usage of survey data by field showed that the highest usage rate was in the social sciences and humanities (46.4%) and then medical and health sciences (37%), with the lowest level of use being in engineering (8.2%) and science (10.2%) ($\chi^2_{(4)} = 181.747, p = 0.000$). The two most prominent fields in terms of the use of graphical data were science (25%) and engineering (30%). It is worth noting that data models were used more in engineering (13%) compared to other fields. The use of lab books, which were not used in the social sciences and humanities, was found to be higher in medical and health sciences (21%) and science (16.6%) than in the other two fields ($\chi^2_{(4)} = 70.901, p = 0.000$). Audio recordings and video data, both of which had a low usage in general, were used more in the social sciences and humanities (15% and 17.7%, respectively) than in the other fields.

According to 4% of the participants, the type of data they used was different from the options in Table 1, but only 10 of them specified the data type

Table 2. Distribution of used or produced data formats.

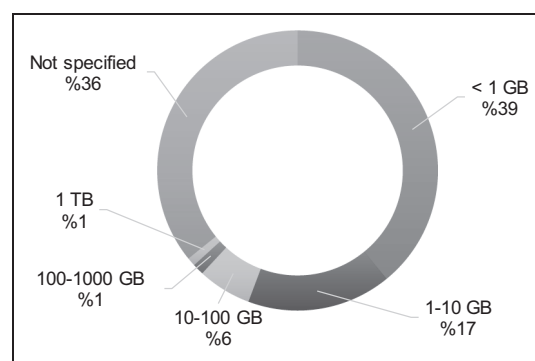
Data format	%
xls	49.5
txt	34.8
Free text	16.4
sav	14.3
csv	13.5
Spreadsheet	9.6
readme (structured)	2.1
readme (unstructured)	1.0

Note: Multiple options could be selected for this question

as abiotic data – that is, data from non-living physical and chemical elements in the ecosystem (five participants) or observational data (five participants). Another striking finding about the data types that were used or produced was that 36% of the participants responded that they did not use any of the 10 data types listed in Table 1 and did not specify any other data type in the ‘other’ option, which is a higher figure than for those who stated that they did not use (17%) or did not produce (29%) research data.

Based on Table 2, which shows the percentages of data formats produced or used, the two data formats that stood out were xls (49.5%) and txt (34.8%), which were used by approximately one in two people. The social sciences and humanities has the lowest rate of use of xls (39.6%) and txt (25.5%) data formats. The use of csv was found to be higher in engineering (19.4%) and agricultural sciences (18.6%). The free-text data format was used at a higher rate in medical and health sciences (23.4%) compared to its use in other fields. The researchers’ use of the sav data format, which was about 8% in engineering, science and agricultural sciences, was 29% in medical and health sciences and 25% in the social sciences and humanities. This finding may be related to the fact that survey data is generally frequently used in these two fields. The most commonly used data formats for survey data were found to be xls (75%) and sav (50%). On examining how the data formats differ according to the other data types used, xls and txt data formats stood out as being the most used data types, as shown in Table 1 and Figure 2).

When the data written in the ‘Other’ option was examined, which was marked by 6% of the participants, it was found that 16 researchers (approximately 1%) seemingly considered word/doc as a type of data format. Moreover, although the data format of the statistical software SPSS is sav, two researchers specified SPSS as a data format in the ‘Other’ option. Additionally, pdf was specified as a data format.

**Figure 3.** Distribution of the data used or produced by the participants in their latest study according to average data size.

Note: GB = Gigabyte; TB = Terabyte.

Another interesting point with regard to the ‘Other’ option was the picture/image and video formats (jpeg, tiff, png, mp4, etc.).

Average data size

It is thought that 36% of the participants who did not mark any of the options related to the average size of the data they used or produced in their most recent studies did not have a sufficient working idea about the subject when they began. The percentage of researchers who did not indicate the size of the data they used or produced was highest in the social sciences and humanities (45%) and lowest in medical and health sciences (24%). This information should be evaluated together with the percentage of those who stated that they did not produce or use research data in their related fields. The percentages of participants who did not produce or use research data for the social sciences and humanities were 37% and 19%, respectively, which were higher compared to the rate in medical and health sciences (17% and 9%, respectively). The percentage of participants who produced or used data larger than 10 GB (gigabytes) was around 7%. In general, it can be said that the data used or produced was not ‘big data’. The size of the data used or produced by 39% of the participants was less than 1 GB. With regard to data for the social sciences and humanities, 70% of the researchers replied that the amount of data they used or produced was less than 1 GB. The rate ranged from 58% to 62% for the other four areas (see Figure 3).

Figure 4 presents the findings on where the participants stored the most recent data they had produced or used. The most preferred medium for storing data was local computers (61.5%), with the highest rate (73.4%) seen in medical and health sciences and the lowest in the social sciences and humanities (52.3%).

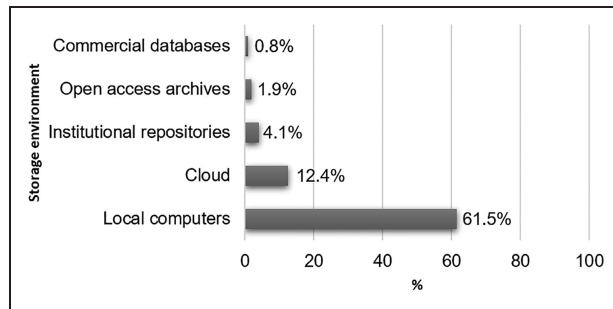


Figure 4. Storage environments of the most recently used or produced data. Note: Multiple options could be selected for this question.

The participants' use of cloud storage was 7% and 9.6% for agricultural sciences and science, respectively. Although there was a 'cloud' option among the options, it is interesting that 'Drive' and 'Dropbox' were put (as other mediums in which data was stored) under the 'Other' option by some of the participants (5%). The storage medium specified by the vast majority of the participants who selected the 'Other' option was 'external disk'. It can also be seen from Figure 4 that the use of institutional repositories or open access archives, for example, for data storage has not yet become widespread in Turkey. There were only 11 participants who stated that they used commercial databases such as the *Data Citation Index* for data storage. Although 71% of the respondents stated that they cited research data, they seemed hesitant to store their data in institutional repositories, open access archives, data archives and other storage options which they believed could facilitate or make it possible for other researchers to cite their data. The use of open access archives, institutional repositories and commercial databases for data storage was quite low in all areas.

With regard to whether the data-storage environment differed according to the title of the participant, there was a statistically significant difference in terms of cloud usage at a 95% confidence level ($\chi^2_{(3)} = 32.114, p = 0.000$). It was found that the Professor (7.4% cloud usage) and Research Assistant groups (25% cloud usage) caused this difference.

Data management plans

In order to improve the answers to the questions about data management plans, the participants were asked whether they had previously conducted a project, with about 76% of the 1205 respondents replying yes. Approximately half (454 participants) of the 913 participants who answered the question on whether they had previously conducted a TÜBİTAK project answered in the affirmative. To the question of

whether a data management plan was mandatory (at least once) for the funding of (at least one of) their previous projects, 121 of the participants (approximately 9% of the participants and approximately 14% of the respondents to this question) answered affirmatively. This finding is supported by Ünal and Kurbanoglu's (2018: 299) study, which found that 13% of their participants had previously prepared data management plans, and 16% had data management plans in their current projects. Researchers in medical and health sciences exhibited the highest rate (14.2%), while those in the social sciences and humanities showed the lowest rate (6.4%) in terms of prior preparation of data management plans. It is thought that the 427 participants (approximately 33% of the respondents) who did not answer this question had no idea about data management plans. Based on these findings, it would not be wrong to say that approximately 91% of the respondents did not know what a data management plan is and/or had never prepared a data management plan before. Approximately half of the participants (49%) thought that open data and data management plans, which are mandatory in Horizon 2020 projects, should also be mandatory for TÜBİTAK projects. Only 7% of the participants expressed a negative opinion on this issue. It is thought that the 31% who did not express their opinion did not have any knowledge of the subject. Whether or not to use research data did not affect the opinion of the researchers ($\chi^2_{(5)} = 6.603, p = 0.252$) on this issue. The question of whether to produce research data cannot be said to have had a significant effect ($\chi^2_{(5)} = 11.196, p = 0.048$), even if those who did not produce research data had a higher positive opinion about data management plans (77.3%) in comparison with those who produced research data (68.4%). The distribution of the 903 participants who gave their opinion on the necessity of mandatory data management plans for TÜBİTAK projects by field showed that the positive opinion ratio for each field ranged from 69.2% to 73.9%, and that there was no statistically significant difference between the fields ($\chi^2_{(20)} = 7.687, p = 0.994$). Similarly, there was no statistically significant difference between titles ($\chi^2_{(15)} = 11.340, p = 0.728$), although the Research Assistant group (79%) had the highest rate of positive opinions on making data management plans mandatory for TÜBİTAK.

Training needs

When asked for their opinions on funding institutions' (TÜBİTAK's) checking of the research data produced during projects, 40% of the participants offered their

opinions, which were significantly positive. The majority believed that the person responsible for the control and supervision of the data was none other than the researcher who had produced or was producing the data. It was stated that TÜBİTAK should have control of research data under the supervision of experts, and it was understood that researchers had many reservations about data security and ethical violations.

The study also found that 67% of the participants and 90.5% of the respondents to the related question stated that they were willing to participate in data management training by TÜBİTAK and to use open access resources and portals created by TÜBİTAK. The existence of a group of 371 researchers who did not express either a positive or negative opinion on the subject is remarkable (approximately 28% of the participants). Although it was found that there was no significant difference in terms of educational needs according to title ($\chi^2_{(3)} = 8.138, p = 0.043$), it can be said that demand for training was lower for Associate Professors (90%) and Professors (88%) in comparison to the other groups. The willingness for education in the different fields ranged from 87% to 93% ($\chi^2_{(4)} = 3.311, p = 0.507$). Moreover, those who used and/or produced research data and those who stated that they did not were equally eager for training. One explanation for this is the presence of participants who declared that they used or produced research data without knowing it.

The majority (59%) of the participants (76% of the respondents to the related question) thought that data produced by public sources is a public good and should be made available to the public as open data. The number of participants who expressed negative opinions in response to this question was very low (8.2% of the participants and 10.6% of the respondents to the related question). The opinions of research data users and non-users about open data were found to be similar ($\chi^2_{(5)} = 5.658, p = 0.341$), but the question of producing data affected the opinions of the participants. An overwhelming majority of the researchers believed that data generated by public resources should be open to the public; this applied to both those who produced research data and those who did not (72.4% and 85%, respectively). The researcher's opinion on this subject was found to differ according to field ($\chi^2_{(20)} = 38.287, p = 0.008$). The reason for this difference is that the rate of supporting an open data approach was approximately 86% in the social sciences and humanities but between 71% and 76.5% in the other four fields of study. Although the participant's title was not an important factor in their opinion about open data

($\chi^2_{(15)} = 11.187, p = 0.739$), the rate of those who gave positive opinions was relatively higher in the Research Assistant group (80.4%). Examining the opinions expressed by the 121 participants showed that the most prominent opinion could be considered the basis of the philosophy of open access, which is that all scientific outputs produced by public resources belong to the public. It was stated that data-sharing would prevent the wastage of resources, would expand comprehensive research and could have a widespread impact. The participants also expressed concerns about several issues, including the use of data to advance personal instead of public interests, data with a high degree of confidentiality, the anonymization of data, guaranteeing the control and governance of data, how to determine the conditions relating to the use of data, and protection of the rights of researchers.

Discussion

This study utilized survey data with the aim of collecting preliminary information for Aperta, the institutional repository of TÜBİTAK, which is being developed by TÜBİTAK ULAKBİM, and obtaining information about ARBIS-registered researchers' levels of knowledge and the current situation with regard to research data, RDM, open data and related subjects.

RDM awareness was found to be high among the survey participants compared to earlier studies conducted in Turkey (Allard and Aydinoglu, 2012; Aydinoglu et al., 2017). It seems that two domains – medical and health sciences and agricultural sciences – led the efforts in utilizing, producing and citing research. Although the social sciences represented the least effort among the five domains, researchers in the social sciences expressed the highest level of support for the argument that publicly funded research data should be made into open data. Furthermore, those scholars who did not generate research data were more in favour of open data policies. These arguments demonstrate that researchers who spend more time working with research data have more reservations and concerns about open data.

The most surprising finding of the study concerns the measure of data citation. Even though previous studies (Allard and Aydinoglu, 2012; Aydinoglu et al., 2017; Ünal and Kurbanoglu, 2018) found that the notion and practice of data citation were not common among researchers, three out of every four respondents stated that they had previously engaged in data citation and knew about it. This can be interpreted as a positive sign that the efforts made by TÜBİTAK, the main funding agency in Turkey, to

increase awareness of RDM and data-sharing have finally yielded some results. However, we also suspect that the respondents were referring to something else when they thought about 'data', such as a table or a graph in an article they had read.

As for data types, formats and size, the experimental data used by one out of every two participants was extensively in medical and health sciences, science, agricultural sciences and engineering. Not surprisingly, its usage in the social sciences and humanities was quite low compared to the other fields. Moreover, data models were used more in engineering, which may be a result of using big data. On the other hand, it was found that the survey data mostly used in the social sciences and humanities and the medical and health sciences had the second-highest usage rate. Aydinoglu et al. (2017: 276–277) found that the most commonly used data types were the same as for this study, but there were significant differences in the usage rate for data types other than for experimental data (53%), text data 47% and survey data (41%).

The highest use of the sav data format, which is the main data format of SPSS and used widely for analysing survey results, is common for these two fields: medical and health sciences and social sciences and humanities. As the main subject of study is human beings in the social sciences and humanities, audio recordings and video data were used more in this field. In general, the xls and txt data formats are the most commonly used, but they have the lowest usage rate in the social sciences and humanities. These two data formats are the most commonly used data formats for each of the most used data types. In Aydinoglu et al. (2017: 278), the two most commonly used data formats have a proximate rate of use. The third (free text at 30%) and fourth (sav at 27.4%) most commonly used data types are also the same in both studies, but the findings of Aydinoglu et al. (2017: 278) show a higher usage rate. The usage of sav files may indicate a problem, as they are not recommended for archiving and publishing because they hinder the interoperability of research data.

Ünal and Kurbanoglu (2018: 296) and Aydinoglu et al. (2017: 279) obtained generally similar results in terms of data-storage environments, data usage in terabytes and the production of researchers. Both studies found a high use of participants' own devices for data storage (96% and 71.6%, respectively) and of in-cloud storage (39% and 46%, respectively). The cloud storage preference among early career researchers was double that of Professors, which corresponds to Aydinoglu et al.'s (2017) study. Similar to the results of this study, Ünal and Kurbanoglu (2018: 296) found that the use of university institutional

archives (9%) and external institutional archives (6%) for data-storage purposes was also very low. That being said, the Council of Higher Education (2019) has initiated an open academic archive system to increase the use of university institutional archives and indirectly help researchers adopt better data behaviours.

Although a direct question was asked about the need for training within the scope of the study, the answers given to some questions also showed the level of knowledge of the participants about the subject, and hence the need for training. In fact, previous studies have also identified the need for training in RDM (Aydinoglu et al., 2017; Ünal and Kurbanoglu, 2018) and documented the demand from their participants for such training (Allard and Aydinoglu, 2012). Approximately 4 out of every 10 participants did not specify the data type and data format they used or produced, or the size of the data they used in their most recent study. It is natural for the participants who did not use or produce research data not to respond to these questions, but it is understood that a considerable number of the participants who produced and/or used research data also did not respond to these questions. For example, in the social sciences and humanities, although 19% indicated that they did not use research data and 37% indicated that they did not produce research data, almost one in two participants (45%) did not (could not) state the size of the data they used in their most recent study. Some of the participants who answered the question about the data type they used erroneously answered the data-format question with 'Word', 'doc', 'SPSS' or 'pdf', and the data-storage question with 'Drive' or 'Dropbox', for example, instead of choosing the 'cloud' option; they may also be added to the group that needs training. On the other hand, although some participants engaged in using or producing research data, they indicated their need or willingness to undergo training.

Not only technical solutions such as Aperta but also sociocultural issues have to be taken into consideration. Despite an attitude of willingness, there is a serious training need for the scientific community in Turkey. A great majority of the participants expressed their desire to attend training on RDM. Based on some of the responses, we suspect that knowledge of concepts such as data, metadata and interoperable data formats, for example, was not very clear in the minds of the participants. A small percentage of researchers in Turkey have been managing research data, but incentives and mechanisms could be designed to disseminate their best practices. The training needs are twofold. First, the information professionals in Turkey need training. There has been no study on how

much they know about RDM (which needs to be investigated in a future study); however, information professionals in other countries need training to support the research community better (Tenopir et al., 2015a, 2017; Wittenberg et al., 2018), and this probably would be the case for Turkey as well. Second, the researchers themselves need training to take better care of their research data, as the participants of this study expressed, and there are plenty of RDM training experiences that can be drawn on for inspiration (Bishop et al., 2020; Leaders Activating Research Network, 2017; Sesartic and Dieudé, 2017).

The responses to questions related to data management plans revealed that researchers in Turkey have limited experience in preparing data management plans – even less than their international partners (Tenopir et al., 2015a). The results of this study and other similar studies (Aydinoglu et al., 2017: 280; Ünal and Kurbanoglu, 2018: 299) demonstrate that researchers in Turkey do not have sufficient knowledge about data management plans, despite TÜBİTAK's initiative to make data management plans mandatory for TÜBİTAK-funded projects. Ünal and Kurbanoglu (2018: 299) found that the percentage of those who did not know whether their institution had a data management plan or not was 73%, with more than 50% of the participants unaware what a data management plan was. However, 84% of them stated that universities should have data management plans. Despite these results, almost half of the respondents were positive about data management plans being mandatory for TÜBİTAK-funded projects.

There was also a contradiction between what was expressed and what has been done. When statements (such as support for making research data that has been publicly funded open data, made by 6 out of every 10 respondents) were compared with the actual amount of research data that has been deposited or shared in organizational archives, open access archives and commercial repositories, huge discrepancies were found. These findings reveal the confusion in the scientific community on how to deal with RDM. There exists not only awareness and goodwill, but also trust issues and poor data habits.

Conclusion

Policies and tools designed to promote RDM and data-sharing should consider the issues discussed above. Incentives (or the lack thereof) impact on how the scientific community adopts data-sharing but, unfortunately, there have been no incentives at all. However, the TÜBİTAK 'Open science policy' promises to change things at the funding-agency level.

DergiPark, the online journal hosting system for academic journals in Turkey with approximately 2000 journals, can enforce data-sharing practices for the articles it publishes. TÜBİTAK can nudge DergiPark in this direction. Furthermore, TÜBİTAK can ask for data management plans in its grant applications and award additional points for the desired RDM behaviours. Along the same lines, the Council of Higher Education, the central body that governs the recruitment and promotion of academics in Turkey, can include data citation in its promotion scheme to encourage data-sharing practices. We expect that such and similar incentives and encouragement would have a huge positive impact on research data handling and management.

As for the awareness and training needs of Turkish researchers, library and information science practitioners and scholars would appear to be the critical group. They understand the basic concepts of RDM but lack experience with real-life RDM and expertise of the domains the research data is coming from. Train-the-trainer sessions would be the first step to address their lack of knowledge and experience. The second step would be linking library and information science professionals to research projects, where they could provide support to active researchers so that their RDM needs are addressed in real time. Simultaneously, RDM or data management plan training could be provided as a general course within the curriculum, such as statistics courses for final-year students or first-year graduate students – that is, those students who are more likely to deal with research data. Another option would be seminars or workshops targeted at active researchers; they could be discipline-specific, as different disciplines have different data habits. Information science professionals and domain scientists are needed to design such seminars and workshops. TÜBİTAK could support such activities, as it did with Aperta.

There is great potential in Turkey – it has a single funding agency (TÜBİTAK, which has influence over scientists), decent research (Turkish-affiliated researchers produce more than 30,000 Web of Science-indexed articles annually), awareness and goodwill (from the results of the current study). Well-thought-out organization of these resources would not only benefit Turkish researchers by supporting RDM activities, but could also be an example for other countries.

As for the future, two studies are planned. First, a survey of DergiPark journals' awareness of and attitudes towards RDM is being designed. DergiPark's journals can support healthy RDM habits. Second, a

detailed analysis of the training needs of scholars from different disciplines is needed, as different disciplines have different approaches to data.

Acknowledgment

We would like to thank people working for The Scientific and Technological Research Council of Turkey (TUBITAK); the Turkish Academic Network and Research Center (ULAKBIM) for their support; Filiz Mengüç and Ebru Aydın for the processes of designing the survey; Murat Köreke for the distribution of survey via LimeSurvey; and M. Mirat Satoğlu, director of ULAKBIM, for his support on matters relating to administrative processes.


Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

ORCID iD

Zehra Taskin  <https://orcid.org/0000-0001-7102-493X>

References

- Allard S and Aydinoglu AU (2012) Environmental researchers' data practices: An exploratory study in Turkey. In: Kurbanoglu S, Al U, Lepon Erdogan P, et al. (eds) *E-Science and Information Management*. Berlin: Springer, 13–24.
- Aperta TÜBİTAK (2019) Aperta – TÜBİTAK Açık Arşivi [Aperta – TÜBİTAK Open Archive]. Available at: <https://aperta.ulakbim.gov.tr/about> (accessed 2 February 2020).
- Araştırma Verileri Yönetimi Eğitim Portalı [Training portal for research data management] (2019) Available at: <https://acikveri.ulakbim.gov.tr/acik-veri-acik-bilim/> (accessed 2 February 2020).
- ARBİS (2019) Available at: <https://arbis.tubitak.gov.tr/home.jsf> (accessed 2 February 2020).
- Aydinoglu AU, Suomela T and Malone J (2014) Data management in astrobiology: challenges and opportunities for an interdisciplinary community. *Astrobiology* 14(6): 451–61. Doi: 10.1089/ast.2013.1127.
- Aydinoglu AU, Dogan G and Taskin Z (2017) Research data management in Turkey: Practices and attitudes. *Library Hi Tech* 35(2): 271–289.
- Bertzky B and Stoll-Kleemann S (2009) Multi-level discrepancies with sharing data on protected areas: What we have and what we need for the global village. *Journal of Environmental Management* 90(1): 8–24.
- Bishop B, Gunderman H, Davis R, et al. (2020) Data curation profiling to assess data management training needs and practices to inform a toolkit. *Data Science Journal* 19(1): 1–8.
- Cochran WG (1963). *Sampling techniques*. New York: John Wiley and Sons, Inc.
- Council of Higher Education (2019) YÖK açık erişim - açık bilim çalışmaları [Open access and open science works of the Council of Higher Education]. Available at: <https://acikerisim.yok.gov.tr/acik-erisim> (accessed 2 February 2020).
- Cragin MH, Palmer CL, Carlson JR, et al. (2010) Data sharing, small science and institutional repositories. *Philosophical Transactions of the Royal Society A* 368(1926): 4023–4038.
- Elsayed AM and Saleh EI (2018) Research data management and sharing among researchers in Arab universities: An exploratory study. *IFLA Journal* 44(4): 281–299.
- European Commission (2016) Open access and data management. Available at: https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-dissemination_en.htm (accessed 2 February 2020).
- Fecher B, Friesike S and Hebing M (2015) What drives academic data sharing? *PLOS ONE* 10(2): e0118053.
- Ferguson AR, Nielson JL, Cragin MH, et al. (2014) Big data from small data: Data-sharing in the 'long tail' of neuroscience. *Nature Neuroscience* 17: 1442–1447.
- Grootveld M, Leenarts E, Jones S, et al. (2018) OpenAIRE and FAIR Data Expert Group survey about Horizon 2020 template for Data Management Plans (version 1.0.0). Available at: <https://zenodo.org/record/1120245#.XJJuEqRRWM8> (accessed 2 February 2020).
- Hardisty A, Roberts D, Addink W, et al. (2013) A decadal view of biodiversity informatics: Challenges and priorities. *BMC Ecology* 13: Article 16.
- Herold P (2015) Data sharing among ecology, evolution, and natural resources scientists: An analysis of selected publications. *Journal of Librarianship and Scholarly Communication* 3(2): eP1244.
- Higman R and Pinfield S (2015) Research data management and openness: The role of data sharing in developing institutional policies and practices. *Program* 49(4): 364–381.
- Ioannidis JPA, Allison DB, Ball CA, et al. (2009) Repeatability of published microarray gene expression analyses. *Nature Genetics* 41: 149–155.
- Ioannidis JPA, Munafo MR, Fusar-Poli P, et al. (2014) Publication and other reporting biases in cognitive sciences: Detection, prevalence, and prevention. *Trends in Cognitive Sciences* 18(5): 235–241.
- John LK, Loewenstein G and Prelec D (2012) Measuring the prevalence of questionable research practices with incentives for truth telling. *Psychological Science* 23(5): 524–532.
- Koltay T (2019) Accepted and emerging roles of academic libraries in supporting Research 2.0. *Journal of Academic Librarianship* 45(2): 75–80.

- Koole SL and Lakens D (2012) Rewarding replications: A sure and simple way to improve psychological science. *Perspectives in Psychological Sciences* 7(6): 608–614.
- Kratz JE and Strasser C (2015) Researcher perspectives on publication and peer review of data. *PLOS ONE* 10(2): e0123377.
- Leaders Activating Research Networks (2017) LEARN toolkit of best practice for research data management. Available at: <https://discovery.ucl.ac.uk/id/eprint/1546518/> (accessed 2 February 2020).
- McAfee A and Brynjolfsson E (2012) Big data: The management revolution. *Harvard Business Review* 90: 60–68.
- MacMillan D (2014) Data sharing and discovery: What librarians need to know. *Journal of Academic Librarianship* 40(5): 541–549.
- Mennes M, Biswal BB, Castellanos FX, et al. (2013) Making data sharing work: The FCP/INDI experience. *NeuroImage* 82: 683–691.
- Michener WK (2015) Ecological data sharing. *Ecological Informatics* 29: 33–44.
- NASA (2011) *Data and Information Policy*. Washington, DC: NASA.
- National Institutes of Health (2008) Revised policy on enhancing public access to archived publications resulting from NIH-funded research. Notice no. NOT-OD-08-033, National Institutes of Health, Bethesda, MD, 11 January.
- National Science Foundation (May 10, 2010) Scientists seeking NSF funding will soon be required to submit data management plans. *Press Release 10-777*, National Science Foundation, Arlington, VA,.
- Nosek BA, Spies JR and Motyl M (2012) Scientific utopia: II. *Restructuring incentives and practices to promote truth over publishability*. *Perspectives of Psychological Science* 7(6): 615–631.
- Pinfield S, Cox AM and Smith J (2014) Research data management and libraries: Relationships, activities, drivers and influences. *PLOS ONE* 9(12): e114734.
- Piwowar H (2013) Value all research products. *Nature* 493(159). Available at: <https://www.nature.com/articles/493159a>
- Piwowar HA, Day RS and Fridsma DB (2007) Sharing detailed research data is associated with increased citation rate. *PLOS ONE*. Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0000308>
- Piwowar HA and Vision TJ (2013) Data reuse and the open data citation advantage. *PeerJ* 1: e175.
- Poldrack RA, Baker CI, Durnez J, et al. (2017) Scanning the horizon: Towards transparent and reproducible neuroimaging research. *Nature Reviews Neuroscience* 18: 115–126.
- Pollock D (2016) Understanding scientific data sharing outside of the academy. In: *79th Association for Information Science and Technology annual meeting*, Copenhagen, Denmark, October 14–18, 2016.
- Roettger TB, Winter B and Baayen H (2019) Emergent data analysis in phonetic sciences: Towards pluralism and reproducibility. *Journal of Phonetics* 73: 1–7.
- Royal Society (2012) Science as an open enterprise: Final report. Available at: <https://royalsociety.org/policy/projects/science-public-enterprise/Report/> (accessed 2 February 2020).
- Sesartic A and Dieudé A (2017) Research data management training and support services at both ETH Zurich and EPF Lausanne. Available at: <https://doi.org/10.3929/ethz-b-000224456>
- Spallek H, Weinberg SM and Manz M (2019) Perceptions and attitudes toward data sharing among dental researchers. *JDR Clinical and Translational Research* 4(1): 68–75.
- Spires-Jones TL, Poirazi P and Grubb MS (2016) Opening up: Open access publishing, data sharing, and how they can influence your neuroscience career. *European Journal of Neuroscience* 43(11): 1413–1419.
- Steeleworthy M (2014) Research data management and the Canadian academic library: An organizational consideration of data management and data stewardship. *Partnership* 9(1). Available at: <https://doi.org/10.21083/partnership.v9i1.2990>
- Strasser CA and Hampton SE (2012) The fractured lab notebook: Undergraduates and ecological data management training in the United States. *Ecosphere* 3(12): Article 116.
- Tenopir C, Allard S, Douglass K, et al. (2011) Data sharing by scientists: Practices and perceptions. *PLOS ONE* 6(6). Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0021101>
- Tenopir C, Christian L, Allard S, et al. (2018) Research data sharing: Practices and attitudes of geophysicists. *Earth and Space Science* 5(12): 891–902.
- Tenopir C, Dalton ED, Allard S, et al. (2015a) Changes in data sharing and data reuse practices and perceptions among scientists worldwide. *PLOS ONE* 10(8). Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0134826>
- Tenopir C, Hughes D, Allard S, et al. (2015b) Research data services in academic libraries: Data intensive roles for the future? *Journal of eScience Librarianship* 4(2): e1085.
- Tenopir C, Pollock D, Allard S, et al. (2016) Research data services in European and North American libraries: Current offerings and plans for the future. *Proceedings of the Association for Information Science and Technology* 53(1): 1–6.
- Tenopir C, Talja S, Horstmann W, et al. (2017) Research data services in European academic research libraries. *Liber Quarterly* 27(1): 23–44.
- Tonta Y (2012) Açık erişim, kurumsal arşivler ve MedOANet Projesi [Open access, institutional repositories and the MedOANet Project]. In: *Ulusal açık erişim çalıştay*

- [National open access workshop], Ankara, Turkey, 8–9 November 2012. Available at: http://ae2012.acikerisim.org/wp-content/uploads/sites/6/2016/11/yasar_tonta.pdf (accessed 2 February 2020).
- Tonta Y (December 17, 2013) Açık erişimin geleceği ve araştırma verilerine açık erişim [The future of open access and open access for research data]. In: *Bilkent'te kütüphanecilik seminerleri [Librarianship seminars at Bilkent]*, Ankara, Turkey,. Available at: <http://yunus.hacettepe.edu.tr/~tonta/yayinlar/tonta-acik-erisim-bilkent2013.pdf> (accessed 2 February 2020).
- TÜBİTAK (2019) TUBITAK open science policy. Available at: <https://acikveri.ulakbim.gov.tr/wp-content/uploads/2019/03/TUBITAK-Open-Sciency-Policy.pdf> (accessed 2 February 2020).
- Ünal Y, Chowdhury G, Kurbanoglu S, et al. (2019) Research data management and data sharing behaviour of university researchers. *Information Research* 24(1): Paper isic1818. Available at: <http://InformationR.net/ir/24-1/isic2018/isic1818.html> (accessed 2 February 2020).
- Ünal Y and Kurbanoglu S (2018) Araştırma verilerinin yönetimi: Türk araştırmacılar verilerini açmaya hazır mı? [Research data management: Are Turkish researchers prepared to open their data?]. *Türk Kütüphaneciliği* 32(4): 287–311.
- University of Pittsburgh (2020) Research data management @ Pitt. Available at: <https://pitt.libguides.com/manage-data> (accessed 2 February 2020).
- Verbakel E, Noordegraaf M and De Smaele M (2013) Data-intelligence training for library staff. In: *Framing the digital curation curriculum – international conference*, Florence, Italy, 6–7 May 2013.
- Wallis JC, Rolando E and Borgman CL (2013) If we share data, will anyone use them? *Data sharing and reuse in the long tail of science and technology*. PLOS ONE 8(7): e67332.
- Whitmire AL, Boock M and Sutton SC (2015) Variability in academic research data management practices: Implications for data services development from a faculty survey. *Program* 49(4): 382–407.
- Whyte A and Tedds J (2011) *Making the case for research data management*. DCC Briefing Papers. Edinburgh: Digital Curation Centre. Available at: <http://www.dcc.ac.uk/resources/briefing-papers> (accessed 2 February 2020).
- Wittenberg J, Sackmann A and Jaffe R (2018) Situating expertise in practice: Domain-based data management training for liaison librarians. *Journal of Academic Librarianship* 44(3): 323–329.
- Xia F, Wang W, Bekele T, et al. (2017) Big scholarly data: A survey. *IEEE Transactions on Big Data* 3(1): 18–35.
- Yegros-Yegros A and Van Leeuwen TN (2019) Production and uptake of open access publications involving the private sector: The case of big pharma. Available at: <https://osf.io/preprints/socarxiv/zt6kc/>

Appendix I

Questionnaire

1. Department:
2. Title:
 - a. Professor
 - b. Associate Professor
 - c. Assistant Professor
 - d. Lecturer, PhD
 - e. Research Assistant, PhD
 - f. Research Assistant (as a graduate student)
 - g. Lecturer (without PhD)
 - h. Other
3. Do you use research data?
Yes / No
4. Have you cited any research data before?
Yes / No / I didn't know that I could cite research data
5. Do you produce research data?
Yes / No
6. Choose the three data types that you mostly used/produced:
 - a. Experimental data
 - b. Raw data
 - c. Text data
 - d. Survey
 - e. Graphs
 - f. Data models
 - g. Lab notebooks
 - h. Audio
 - i. Video
 - j. Remote sensing
 - k. Other (please specify)
7. Choose the three data formats that you mostly used/produced:
csv / xls / txt / spreadsheet / sav / free text / readme structured / readme unstructured / other (please specify):
8. What is the average size of the data you used/produced in your latest study? (please specify as MB, GB, etc.):
9. Where do you store the data for your latest study?
Local computer / cloud / open access archives / institutional repository / commercial databases (e.g. Data Citation Index) / other (please specify):
10. Have you conducted a project before?
Yes / No
11. Have you conducted a TÜBİTAK-funded project before?
Yes / No
12. What is the number of your TÜBİTAK-funded projects?

13. Type of your TÜBİTAK-funded projects? Strongly agree / Agree / Neither agree nor disagree / Disagree / Strongly disagree
14. What is the number of publications produced from your TÜBİTAK-funded projects?
Article:
Proceedings:
Patent:
Other:
17. What do you think about making the data produced by public resources/funds available to the public as open data??
Strongly agree / Agree / Neither agree nor disagree / Disagree / Strongly disagree
15. Was it required to prepare a data management plan in any of your previous projects?
Yes / No
18. Would you like to participate/use if TÜBİTAK makes data management awareness studies available (training, portal, open access resources, etc.)?
Yes / No
16. What do you think about open data and data management plan practices being mandatory for TÜBİTAK projects, which are already required for Horizon 2020 projects?
19. What are your suggestions for controlling the research data produced during the projects by the funding institution TÜBİTAK?



Analysis of the alliance of archives, libraries, and museums of South Africa National Parks: Kruger National Park

International Federation of
Library Associations and Institutions
2021, Vol. 47(1) 65–77
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0340035220912514
journals.sagepub.com/home/iff



Nkholezeni Sidney Netshakhuma

Department of Information Science, University of South Africa

Abstract

The research aims to analyse the alliance of archive, library and museum (ALM) at the Kruger National Park with regards to compliance with legislations, ALM's role in education and the adoption of information and communication technology. A qualitative method was used to collect data. The research found that most of the participants were not aware of the legislations governing ALM in South Africa. ALM was not fully utilised for educational activities to enhance knowledge management; there is a low rate of adoption of information and communication technology as an enabler to provide education. Hopefully, this study will help to formulate research agendas to address societal challenges, such as adopting the policies which will have a positive impact on the implementation of ALM policies.

Keywords

Alliance, archive, library and museum, education, technology

Submitted: 17 April 2019; Accepted: 22 January 2020.

Introduction

The article aims to analyse the alliance of an archive, library and museum (ALM) at the Kruger National Park (KNP) by assessing compliance with legislations, role in education and adoption of information and communication technology (ICT). ALMs have more in common than they are different; they serve various communities. ALMs are natural partners. Although ALMs are located in different organisational structures in the KNP, they have similar goals of providing education. The ALM alliances enable KNP to merge different skills and knowledge to achieve an organisational mission of connecting to society. The role of the ALM is to identify, collect, preserve and describe records or artefacts materials and make available artistic products of the past and present to the future generation.

Problem statement

There is little recognition of the alliance of ALMs in South Africa's role to provide education and access to information to enhance knowledge management. Only a few alliances of ALMs in South Africa were

conducted such as the Kimberley Africana Library at the Sol Plaatjie Municipality in the Northern Cape and the De Beers Archives, in which all three institutions share knowledge and customer service (Yarrow et al., 2008). The above-mentioned alliance involves different organisations. Hence, this particular study alliance involves KNP with different departments such as archive, library and museum under the umbrella of heritage management. According to Mabunda (2003) and Netshakhuma (2019g) the overwhelming majority of research studies conducted in KNP are on biological diversity. None of the research conducted at KNP covers aspects of the ALM alliance.

Purpose

The purpose of this article was to analyse the alliance of ALM at KNP by assessing their compliance with

Corresponding author:

Nkholezeni Sidney Netshakhuma, Department of Information Science, University of South Africa, Pretoria Muckleneuk, Pretoria 0003, South Africa.
Email: sidney.netshakhuma@ump.ac.za

Table 1. Interview participants

Number of Participants	Positions	Duties and responsibilities
3	Record officers	Filing, allocation of reference number
3	Assistant Librarians	Cataloguing books, issuing of books and cataloguing of archival materials
1	Archives assistant	Appraisal of records and description of records
1	Records Manager	Management of both archives, library and museums of national parks in South Africa
1	Heritage Manager	Responsible for the cultural and heritage management throughout the national parks
1	People and Conservation Officer	Interpretation and analysis of artefacts.

legislations governing ALM in South Africa, their role in education and the adoption of ICT to enhance education and to make recommendations based on the findings.

Theoretical framework

This research adopted the International Committee for Documentation of the International Council of Museums (CIDOC) Conceptual Reference Model (CRM). The CIDOC CRM was developed in 1996 (Doerr et al., 2008). This theory is an object-orientated domain ontology for the interchange of rich and heterogeneous cultural heritage from ALM. The CIDOC CRM is an international organisation for standardisation (ISO) (Doerr, 2003). The CIDOC CRM theory acts as a conceptual guideline to aid in developing integrated information systems with a higher level of semantic interoperability. ALM organisations are coming closer together in a variety of ways and under a variety of models (Gwinn, 2009). ALM institutions are similar in terms of collection type, curatorial approach, subject discipline, granularity of description, level of detail of description, descriptive data structure and descriptive data content values (Gill, 2004). There is no single descriptive schema which meets the needs of all ALM functions. According to Novia (2012), ALMs have different standards and practices that need to be reconciled into one collaborative project. Libraries use the MARC standard to capture bibliographic information, an archive uses the encoded archival description (EAD) and museums use the collection management systems to search automated collection management information. The role of CIDOC CRM theory is to promote a shared understanding of the concept used in a cultural heritage documentation by acting as a conceptual reference model. According to Gergatsouls et al. (2010) managing heterogeneous data is a challenge for ALM institutions

because of different types of collections preserved by these institutions. The model is designed to promote the meaningful exchange of heterogeneous digital cultural content from the ALM institutions.

According to Goerz et al. (2008) CIDOC CRM theory serves as follows:

- as a generic background ontology for application modelling;
- as a tool for interoperability and data integration either by pre-processing databases (data transformation) or at access (time by inference);
- for processing complex queries which require inference;
- to check consistency and coherence of extension of the theory.

The use of CIDOC CRM is applicable to this article as the researcher aims to assess the level of compliance with legislations and the role of ALM in education.

Research methodology

The research design of this study is a case study. The reasons for the researcher to select KNP as a case study is because its resource centre, namely the Stevenson-Hamilton Information Resource Centre (SHRC) ALM, is based in one institution. The study was limited to the SHRC. A purposive sampling of 10 practitioners was adopted. The sample size of the interviewees therefore stood at 10. The profiles of the participants are shown in Table 1.

The targeted departments such as archives, library and museums have a direct obligation to oversee the welfare of ALM functions in terms of preservation, providing access, education, management and compliance with ALM functions-related legislations. The data was collected through interviews with key staff members based on an interview schedule that was

designed along the research topic which was complemented by document analysis in the form of archives materials, oral history files and annual reports.

History of South African National Parks

The South African National Parks (SANParks) include the following parks: Addo Elephant, Agulhas, Augrabies, Bontebok, Camdeboo, Garden Route, Golden Gate Highlands, Kalahari Gemsbok, Karoo, Mapungubwe, Marakele, Mokala, Mountain Zebra, Namaqua, Richtersveld, Table Mountain, Tankwa, West Coast and KNP (SANParks, 2019: 16). The researcher selected KNP to conduct the research because of its rich history of cultural history management. For the purpose of this research, SANParks will be used interchangeably with KNP. KNP is one of the biggest parks in Africa.

The KNP has its origins in the 1898 proclamation of the Sabie Game Reserve. The KNP is renowned for its unparalleled wildlife management in the African continent (Mabunda, 2003). KNP preserves the South African heritage in the most pristine condition for future generations (Ubisi, 2014: 22). The KNP is part of the Great Limpopo Transfrontier Park (GLTP), which includes the established Limpopo National Park in Mozambique and Zimbabwe (Sandwith and Pfothenhauer, 2002).

SANParks was established in the terms of the repealed National Parks Act, 57 of 1976 and continues to exist in terms of the National Environmental Management: Protected Areas (Act, 57 of 2003) with the mandate to conserve, protect, control and manage national parks and other defined protected areas and their biological diversity. Furthermore, SANParks is managed by the Public Finance Management Act (No. 1 of 1999).

Section 55 (1) of the National Environmental Management: Protected Areas Act (No. 57 of 2003) includes participation in international, regional and national initiatives relevant to its mandate identified by the Minister of Environmental Affairs as part of SANParks' responsibilities. The international convention of which SANParks is part includes the World Heritage Convention (WHC) which aims to promote cooperation among nations to protect all forms of natural and cultural heritage of outstanding universal value. The principles and guidelines of this convention are used by SANParks to guide its policies and plans for the management of ALM assets associated with the national parks.

The idea of merging ALM resources at KNP was first articulated in 1969. At that time, the ALM services co-existed under a common administrative

structure known as the SHRC. Even though there is no single professional title that encompasses everyone who works in the information resource centre. The SANParks 2008/2009 strategic plan presented the idea of a resource centre that would include resources of the ALM functions within a single entity. The archivist, librarian and museum curators report to the head of corporate services. At the time of the interviews, the ALM functions resided in the same building. Hence, there are no artificial boundaries of ALM departments. The SHRC was established to support the memory of James Stevenson-Hamilton who served from 1902 to 1946 as the first warden of South Africa's Sabie Nature Reserve which was incorporated in KNP in 1926. SHRC was established to advance the interests and goals of KNP and provide physical or virtual access to specialised information resources. One of its great attractions at Skukuza is the Stevenson-Hamilton Memorial Information Resource Centre housing a collection of ecologically orientated books, paintings and memorabilia. Knowledge can be gained in the SHRC, while visitors can attend to life-long learning opportunities. The SHRC has cultural, social and historical significance as the first park resource centre. The collections preserved in the parks include the African collection which consists of information about the history of KNP. Archives and libraries functions were established to support the museum function to contribute to their parent organisation by helping them to develop their own approach to information and knowledge management. This statement is alluded to by Jones (2016) who said that museum activities tend to have a different relationship to interpretation and dissemination when compared to archives and libraries functions.

The concept of information resource centre was developed in the KNP and has extended to other parks. These centres are being developed through the alliance of ALM departments of each national park. Even though their manifestation is not the same as the national park system, the premise of establishing a building that functions as a focus point like an ALM is a key agenda. The establishment of the information resources centres is ongoing and there are increasing projects dedicated to making them a successful project.

KNP engages with the national Department of Arts and Culture, Basic Educational Department of Higher Education and Training which have oversight of heritage resources in South Africa. The ALM function provides a pivotal space for negotiating meaning about past histories, reconstructions of cultural memory and reinterpretation of culture (Anderson, 2005: 15). The KNP ALM are the product of historical

struggle as they are sources of the history of the development of the park (Netshakhuma 2019h). SHRC provided a wealth of information about the development of the park. Through the collection preserved in the information resource centre it is possible to locate the moment when KNP started.

Literature review

The article was reviewed based on the legislations governing ALM in South Africa, its role in education and its adoption of information communication technology as enabler to provide education to various stakeholders.

Legislations

The ALM alliance are mostly influenced by a legal mandate. The study conducted by Gibson et al. (2007) found that developed countries such as United States of America (USA) enacted legislations such as the Federal Museums and the Federal Public Records Act of 1838 and the Library Services Act of 1996 to promote the alliance of ALM functions. The congressional legislation on preservation of ALM being produced is the driving force behind the commitment towards cultural heritage management (Katre, 2012: 322). In the USA, the Institute of Museum and Library Services (IMLS) plays a role in promoting a culture of library and museum alliance through policy and National Leadership Grants (NLG) (Zaid and Abioye 2010: 62). In Britain, the Public Libraries and Museum Act of 1964 placed made local authorities responsible for ALM functions. According to Gibson et al. (2007) ALM enjoyed close links because municipalities had combined the functions of ALM.

Some of the developing countries have not enacted legislations governing ALM functions. In Nigeria, ALM functions alliance has not been enacted by legislation or policy (Zaid and Abioye, 2010). However, there was a recognition of ALM alliance through awareness and promotion. The survey conducted by Alegbelaye (2013) acknowledged the importance of ALM functions for promoting educational activities and teaching.

After South Africa gained democracy, there was a need to transform the role of ALM functions at KNP to serve the need of all South Africans (Netshakhuma, 2017). Post-apartheid SA had responsibilities to provide free and open access to information to all its citizens (Satgoor, 2015). The Constitution of the Republic of South Africa (Act 108 of 1996) articulates the right to information. In South Africa, the alliance of ALM has been promoted by legislations. For example, the SANParks mandate is underpinned

by section 24(b) of the Constitution of the Republic of South Africa, Act 108 of 1996 which requires secure ecologically sustainable development and use of natural resources while promoting access to information. According to Satgoor (2015) and Netshakhuma (2019f) ALM are managed under the National Library of South Africa Act (Act 2 of 1998), the Legal Deposit Act (54 of 1997), State Information Technology Agency Act (88 of 1998), the South African Library for the Blind Act (91 of 1998), the Public Finance Management Act (Act 1 of 1999), the National Council for Library and Information Services Act (6 of 2001), the Education Laws Amendment Act 31 of 2007 and the Protection of Personal Information Act 4 of 2013), the Copyright Act (98 of 1978), the National Archives and Records Services Act (43 of 1996). In a nutshell, these legislations provide guidelines on a national preservation of ALM. These legislations aim to fulfil the provision of public education in SA (Gibson et al., 2007: 53). The legislations can influence the digital preservation initiatives at national level and the institutional policies (Katre, 2012). Legal framework is meant to provide the required mandate, decisions, financial support and commitment from the authorities for the digital preservation of information created by organisations.

Education

According to Innocent (2009) the ALM functions recognise that provision of education and knowledge management is an essential function of the cultural management institutions. Satgoor (2015) found that the ALM functions provide the public with spaces for information and learning and are accessible to all groups in societies. The ALM functions play a role in the participation in society through lifelong learning. The aim and objectives of ALM do fit well in lifelong learning (Gibson et al., 2007). The ALM functions form an alliance with schools to provide education to society. Usherwood et al. (2005: 55) suggested that ALM functions are seen to perform a role of providing a context to education. ALM functions collect data in a variety of forms in an attempt to establish the efficiency of service, client use and satisfaction (Lo et al., 2014: 107). According to Sirinides and DuBois (2011) the ALM functions play a role in providing opportunities for teaching and learning. The role of ALM in supporting research and education is essential to societies (Lei, 2019). Most of the records found in the ALM are in different formats. Some of the records available in ALM are archival materials, artefacts and other kinds of information-bearing objects. The ARM is a component of the

information environment of any society and plays a critical role in connecting information resources and services with community (Caidi, 2005).

The ALM functions are emerging as community partners for a development and social transformation (Satgoor, 2015: 103). The ALM function in South Africa is being redefined as it continuously moves away from the recreational to educational activities. ALM are poised to participate in the development of an educated and engaged citizenry. The study by Usherwood et al. (2005) found that the ALM functions are perceived as having a value in recreational activities. Tourists visit the national parks as a way of enjoying all forms of nature and environment. According to Lo et al. (2014) the concerns for ALM are to provide a rich experience for the visitors and to engage the public in terms of their rich and exciting contents. The greatest concern for these institutions is to remain meaningful for future generations. ALM functions are to remain relevant to societies in which they reside and serve.

According to Innocent (2009) ALM functions play an essential role because of the following:

- engaging local spaces that a broad range of people feel comfortable in;
- not viewed as formal learning environments and so can re-engage people in learning both formally and informally;
- offering opportunities for individuals, groups and families to learn together throughout life and play an intergenerational role that has wider community benefits;
- places that not only support people to develop skills and knowledge but also lift people's spirits and build confidence.

Organisations are looking to ALM functions to play a role in providing children and families with access to high-quality learning experiences (Swan et al., 2013). There is a high need for information about current availability and accessibility of education opportunities of ALM functions (Sirinides et al., 2017).

The study conducted by Sirinides and DuBois (2017: 573) found that societies do not take advantage of ALM resources. The ALM functions seek alliances that offer needed implementation capacity, allow access to specialised learning activities and support local community engagement. According to Sirinides and DuBois (2017: 573) increased access to and benefits of early learning programmes in the ALM functions facilitate alliance among ALM functions and community education.

The study conducted by Duff et al. (2013: 5) found that alliance of ALM functions requires professional and research skills of information professionals. Hildreth (2006) found that alliance projects play an essential role to the benefit of stakeholders in providing information to the society. The qualifications of employees dealing with ALM functions are a challenge to these professions because of lack of qualifications and skills (Netshakhuma, 2019c; Novia, 2012). Librarians require a Master's degree in Library and Information Science, archivists or museum curators require a degree in History or Archival Science. Because of a lack of comprehensive ALM education, the ALM functions alliance became a challenge to identify the specific qualification required.

According to Satgoor (2015: 104) and Netshakhuma (2019h) there is wide-scale cognisance that the best way to address and support the transformation of ALM functions into community hubs is for the organisation to invest in staff development and training.

Adoption of information communication technology

The need to improve competitiveness, innovation and creativity enhances the need to collect, manage and share information (Waibel and Erway 2009: 3). ALM functions are embracing ICTs to meet the needs of users (Lei, 2019). It seems that most of the youth prefer to use and to view most of the ICT ALM resources.

The development of ICT facilitates the use of ALM materials (Anderson, 2005). Digital technologies provide opportunities for the dissemination of ALM collections, better storage capabilities, preservation, better scope for circulation of public domain material and streamlined processes of classifying material. According to Chaterera (2015), the use of technologies as a communication tool has gained remarkable attention among scholars and researchers. Ngoepe and Ngulube (2011) suggested that some institutions are using Web 2.0 technologies to provide ALM functions to strengthen institutional relationships.

ALM functions must be aware of varying levels of ICT that hold the potential to enhance user experience when implemented across disciplines (Novia, 2012). An alliance effort on the part of ALM will provide open access to a wider range of records and artefacts. Cross-institutional alliances are impossible without the development of standards (Wythe, 2007).

The study conducted by Kalfatovic et al. (2008) on alliances of ALM was driven by the need to have a plan to embrace the social networking reality of the Web. The project posed a challenge with

technological changes caused by the development of technology. The digital project was successful because of the inclusion as members of the Chief Information Officer, Smithsonian Center for Education and Museums, Smithsonian Institution Archives, Smithsonian Institution Libraries and Smithsonian Photography initiatives. The lesson learned in the Smithsonian project includes increase of public knowledge and access to the Smithsonian digital collections, programmes, expertise and resources through the use of the Smithsonian collections.

The study conducted by Chaterera (2015) found that the utilisation of Web 2.0 in Zimbabwe ALM institutions is still in the early stages. The study recommended the formulation of policies and strategies that emphasise the use of Web 2.0 technologies. This implies that ICT will enhance collaboration between archives, libraries and museums.

Digitisation of ALM functions responds to the need of users to access various collections. Digital technology enables organisations to access various ALM collections (Netshakhuma, 2016). However, ALM functions are facing challenges in terms of continuing their function within a digital environment; they are also faced with new demands from new user groups who demand to access information (Anderson, 2005). The youth prefer to use advanced ICT to access archives, libraries and museums. The study conducted by Netshakhuma (2019d) indicated that social media is an essential mechanism for archivists to access archival materials.

Cultural heritage institutions realign their service delivery mechanisms to meet the user's expectation by providing broader networked access to collections and collection information (Timms, 2009: 68). Integrated, on-line access systems could exist both within single institutions and among institutions (Timms, 2009: 68). Most of the institutions are adopting the digitisation strategy to promote access to their collection (Jones, 2016: 220). Digitisation eliminates costs of physically visiting ALM institutions. The study conducted by Duff et al. (2013) found that the advent and broad implementation of digital technologies across the ALM sector had an impact on alliance and convergence initiatives amongst ALM. Digital technologies were seen as the platform for integrating media across information services. According to Duff et al. (2013) the collaborative projects at Archives New Zealand/National Library of New Zealand and Taylor Family library provide examples of institutions influenced by the form of coexistence to convergence. Digitisation of ALM products, processes and institutions from the creation of online catalogues to the emergence of born digital collections is opening a promising role for the

institutions and will raise issues and increase the profile of ALM (Caidi, 2006: 210).

The idea of an information environment in which the entire information is within the user's grasp is as old as the very urge to collect (Waibel and Erway, 2009: 3). This statement is alluded to by Kalfatovic et al. (2008) who indicated that the vision of unified access to ALM materials outlined provides a context for alliance among archives, libraries and museums.

According to Jones (2013), institutions cannot continue to rely on individuals as a means of maintaining key knowledge. Therefore, different ALM institutions have different perspectives on disseminating information. A connection between ALM presents these institutions with a shared environment where previously recipients of content are given the platform to exchange their thoughts with other patrons (Samouelian, 2009). Greater alliance between institutions whose primary task is to safeguard cultural heritage should be encouraged and promoted (Delaney et al., 2015).

The ALM alliance projects can be beneficial by raising awareness in the marketing impact to the larger community and raising the visibility of all organisations (Diamant-Cohen et al., 2003). Alliances on development of advanced technical infrastructure must be encouraged among departments (Delaney et al., 2015). This statement is also alluded to by Waibel and Erway (2009) who indicated that ICTs influence alliance globally. The ALM alliance offers institutions the opportunities to develop practical software and standards for broader content sharing (Rinehart, 2003).

Archivists, librarians and museum specialists need an alliance programme that ensures that its professional curatorial responsibilities are fulfilled (Pitti et al., 2015: 80). Accordingly, ALM alliance is influenced by the vision and mission statements of an organisation. ALM alliance must become part of the organisational mandate of any heritage institution. The mandate is supposed to outline an organisation's strategic plans. For an alliance's efforts to succeed, efforts should be made to ensure that incentives are to be in place from all organisational activities. Alliances can benefit from the presence of a 'change agent'. A change agent is someone who can influence and drive successful implementation of a project in an organisation. A change agent is supposed to be a trusted individual, department or programme that promotes cultural preservation. The change agent must be able to ensure that ideas, technology and staff are available to ensure that the project is successful (Waibel and Erway, 2009). The implementation of ALM alliances leads to changes of behaviours, processes

and organisational structure, and to an interconnect- edness and interdependence among partners. Accord- ing to Waibel and Erway (2009) the transformative activities are what will put ALM functions in a posi- tion to take advantage of economics as well as tech- nology and so become a transformative force for the clients. The Web 2.0 is to challenge the authoritative role of librarians, archivists and museum curators as the main custodians of the narrative on world cultural heritage (Sanjuan and Menard, 2015: 250).

Digitisation policy encourages universal access and access to information. Digitisation seems to be a driver of alliance and convergence between ALM alliances (Klimaszewski, 2015). One goal of digitisa- tion is the creation of a single point of access to digital materials. Digitisation is essential for both the preser- vation of cultural heritage objects and the preserva- tion of the information about these objects, digital captures and related digital information (Netsha- khuma, 2019b).

Data analysis

The qualitative data are based on transcriptions of comments from the interviewees and document anal- ysis made in response to the open-ended questions during the interviews. The data analyses are organised by the themes of legislations, education and role of technology on alliance of ALM functions.

Legislations

The participants 100% were asked whether they were aware of legislations governing ALM in SA (see Table 2). The majority of participants, seven (70%) indicated that they were not aware of legislations gov- erning ALM in SA. Most of the participants who were not aware of the legislations were staff from lower levels such as archives assistants, records officers, assistant librarians and people and conservation offi- cers. Only three (30%) said that they were aware of legislations governing of ALM. Most of those staff who were aware of the legislations governing the ALM were Records Manager and Heritage Manager. The legislations which were mentioned by most of the participants included the National Archives and Records Service Act 43 of 1996 and The Legal Deposit Act (54 of 1997). This was so because man- agers and programme heads had a background of working in an ALM environment.

Education

The participants were asked about any role the ALM play in education (see Table 3). The majority of

Table 2. Awareness of legislation governing ALM.

Response		
Aware of the ALM legislations	3	30%
Not aware of ALM legislations	7	70%

Table 3. Role of ALM in education.

Participants' response	Yes	No
Number and percentage of response	8 (80%)	2 (20%)

Table 4. To what extent do ALM offer programmes for community education.

Number of participants	Programmes
5 (50%)	Exhibition
2 (20%)	Research, storytelling, arts and crafts
3 (30%)	Annual events

participants (8, 80%) indicated that they valued the importance of education while two (20%) indicated that they did not view ALM as important in terms of providing education and learning activities. The fact that record officers, assistant librarians and archives assistants were appointed without or with only a Grade 12 school certificate implies that they could not value the importance of education. This finding showed the importance and effectiveness of education in offering educational activities in the ALM programme.

The SHRC contributed on offering innovative and unusual programmes out in the community by identi- fying a community location, developing a structure for the programme. It is about ALM as part of the broader social and cultural landscape of a society that information culture can and will change (Caidi, 2005).

When participants were asked to respond to the following questions, to what extent do ALM offer programmes for community education?, What is the nature and type of the programming that currently exists?, five participants (50%) stated that informa- tion was provided through exhibitions (see Table 4). Five participants (50%) indicated that there was a permanent exhibition of storytelling in the KNP where tourists or visitors could view the exhibition. Three participants (30%) indicated that most of the visitors visited the ALM during an annual event such as the national library week, the archives week, the

heritage days and other special days organised by the national or provincial Department of Arts and Culture, National Archives and Records Service of South Africa (NARSSA). In terms of the types of programming offered, archives and libraries mentioned story time, museums mentioned a range of activities such as an exhibition. The focus of these activities was targeted at various communities to ensure dissemination of information to various stakeholders.

To what extent do alliances support programming for community development? The data collection indicated a limited number of alliance activities that supported community development. Although some of the participants reported that ALM alliance supported the initiative for community development, some participants that did report partnerships found them to be important for providing a service to the KNP community.

Participants were asked to identify areas where they felt ALM alliance would be useful for community development (see Table 5). Five participants (50%) indicated that alliance between KNP and universities such as the University of Mpumalanga, the University of Pretoria and the University of South Africa contributed to community education. The success of a universities and KNP alliance is viewed as a future trend that will assist to solve the issues, controversies and problems surrounding who creates digital heritage content, who has access to it, and for what purposes (Van der Elst et al., 2011: 152). The review of document analysis found that KNP entered into a memorandum of understanding with various universities for research, education, leisure education and promotion of knowledge management. This finding shows that there is a link between ALM and the syllabus of universities. Three participants (30%) indicated that there is education programme which encourages learners to visit KNP to learn about South African history and heritage. This finding shows a link between ALM and other various educational activities in education. Two participants (20%) expressed that they do not believe that the information resources are places for educational activities.

It was important to understand the importance of the ALM programme. The participants were given opportunities to share their experience on information management. What were the challenges that Information Services face in designing and implementing education programming for community development?

Participants were asked to indicate challenges experienced in providing education to the public (see Table 6). The majority of participants (8, 80%) indicated that lack of funding for ALM activities was cited as the major challenge for the development of

Table 5. Areas of community education alliance.

Participants	Area of participants
5 (50%)	Universities
3 (30%)	Schools (primary and secondary),
2 (20%)	Not a learning activity

Table 6. Challenges of ALM in South Africa.

Participants	Challenges
8 (80%)	Funding
2 (20%)	Skills and competencies

Table 7. Level of education.

Level of education	Participants
Participants with Honours degree and above	None
Participants with junior degree	4 (40%) qualification in Archives Management and Library and Information
Participants with Matric and equivalent qualification	5 (50%)
Participants without Matric qualification	1 (10%)

programmes. Two participants (20%) indicated lack of community development skills with regard to the development of ALM. One of the participants said that 'there is a lack of staff to develop and implement an effective ALM programme'.

The participants were asked to state their level of education. Table 7 shows that there is lack of staff with skills and knowledge to manage ALM. The researcher found that all participants lacked qualifications ranging from an Honours degree to Doctoral level. However, the study found that there are efforts made by KNP to capacitate staff from all levels in order to improve their educational level. At the time of the interview, there were two participants who were studying towards an Honours qualification in Information Science with the University of South Africa. However, the fact that there were staff who were managing museum functions without appropriate qualifications was a major concern for the researcher. A majority of participants (5, 50%) were in possession of a matric qualification and equivalent qualification. The study found that only four (40%) participants possessed a qualification in Archives Management and Library and Information Management. Hence only one (10%) of the staff members was without a matric qualification. The finding shows

that the educational qualification has an impact on the development and implementation of ALM functions. These results imply a link between the level of education and the implementation of ALM programme.

The 10 (100%) participants were asked to mention any activities which will be offered by the ALM institution in the future (see Table 8). The majority of participants (6, 60%) mentioned that they 'play games for kids' as the activities to be included in the KNP to encourage participants to visit the park. Four participants (40%) mentioned that the introduction of gift shops would enable the participants to visit the park. This result implies that SANParks is to develop various programmes to encourage people to visit the national park.

Adoption of information communication technology

It was in the interest of this study to find out challenges hindering the ALM in KNP from fully adopting technology to provide access to information.

All the participants (100%) were asked what is it that has brought ALM close together over the period and allowed KNP to develop alliance techniques and projects (see Table 9). Five participants (50%) indicated that they shared a central core of professional skills and tenets. Half of the participants (5, 50%) indicated that they embraced ICT as a means of encouraging access to information. Of the participants 30% said that the KNP was not involved in the collaborative activities within national parks systems. The KNP lack an inter-department relations policy which is a barrier to collaboration among departments. The SANParks is to review their organisational structure to ensure that archives, museums and libraries report to a general manager: heritage management. Furthermore, staff are to attend courses which will enable them to understand concepts of managing heritage sector. Two participants (20%) did not respond to the question.

The participants were asked their level of skills and competences with regard to digitisation and technology (see Table 10). The researcher found that a majority of participants (8, 80%) possessed basic skills in ICT, while only two (20%) had advanced skills in technology. The findings show that staff lack skills in the management of digital technology. The analysis of information through observation found that there is online presence and use of digital media by museums. It was essential that museums should operate according to the mission of the parent organisation. The data analysis found that indeed there is a challenge for the development of technology, society expectations and operating environments.

Table 8. Future activities to be included in the ALM.

Participants	Responses
6 (60%)	Playing games for kids
4 (40%)	Shops

Table 9. Alliance of ALM.

Response	Frequency	Percent
Does not collaborate	3	30
No response	2	20
Alliance	5	50

Table 10. Skills and expertise in digital technologies.

Participants	Reponses
8 (80%)	Basics skills in ICT
2 (20%)	Advanced skills in technology

Findings

The qualitative results are based on transcriptions of comments from the interviewee and document analysis made in response to the open-ended questions during the interviews. The results and findings are organised by the theme of legislations, education and role of technology on alliance.

Legislations

As indicated in the research results, the majority of the participants who deal with ALM functions are not aware of most of the legislation governing ALM in KNP. The researcher found that most of the participants are not aware of the National Library of South Africa Act (Act 2 of 1998), the State Information Technology Agency Act (88 of 1998), the South African Library for the Blind Act (91 of 1998), the Public Finance Management Act (Act 1 of 1999 as amended by Act 29 of 1991), the National Council for Library and Information Services Act (6 of 2001), the Education Laws Amendment Act 31 of 2007 and the Protection of Personal Information Act 4 of 2013) and the Copyright Act (98 of 1978). This finding is in agreement with Popoola (2003), Wamukoya and Mutula (2005), Olatokun (2008) and Netshakhuma (2019a and 2019b) who indicated that the increasing deterioration, lack of coordination in handling records, absence of policies and procedures were cited as the major challenges to preservation of ALM functions in Sub-Saharan Africa. This is a concern with regard to

the implementation of ALM programmes in KNP. Lack of awareness of legislations may be contributed to by the lack of awareness and training by the resource centre. The fact that most of the staff in lower positions lack academic qualifications means that they could not interpret and analyse the legal framework governing ALM.

Education

It appears as if the ALM functions are not perceived as a source of formal education. The fact that SHRC can cater to a variety of educational activities and need is not highly valued. There are a smaller number of South Africans who visited SHRC compared to the international visitors. The high number of the international visitors can be attributed to access to resources through the Internet and other platforms. The researcher assumed that the majority of South Africans failed to visit ALM because of lack of access to resources. It appears that most of the participants viewed ALM functions as the information related to the apartheid period and considered that it only served the minority group in South Africa.

The analysis of KNP annual reports found that KNP initiated programmes such as the library week, the archives week, the People and Parks, the Kids in Parks and the museum week to encourage the community to visit ALM for lifelong learning to supplement formal education. According to Ledwaba (2016: 8), the project of taking the library to local schools started in KNP in 2011. South Africa library week is one of the platforms for libraries to market their services and reach out to communities. The purpose of visiting communities was to encourage learners to read and create awareness on the importance of using libraries, archives and museums.

Through the KNP outreach programme, the disadvantaged communities such as black communities were able to visit and access the ALM resources free of charge. KNP recognised that historically, the legacy of KNP has led to a situation where not all sectors of society have the sense of loyalty and belonging that is felt by the traditional visitor base to the park. KNP recognises its potential to play a role as a national symbol and to contribute to social cohesion in society. At the period of writing this article, KNP is implementing a comprehensive environmental education programme which sees over 100,000 learners participating annually. KNP aims to grow the number of learners participating in these programmes by 2.0% per annum to the year 2030.

It appears that the South African Government believes that ALM functions should play a role in

social inclusion and lifelong learning. The researcher believes that ALM functions can contribute to educating South Africa and the rest of the world community. The interviews with the participants found that ALM functions were important as they contribute to people's enjoyment and inspiration, cultural values, learning potential of the organisation and economic prosperity.

The SHRC has a unique local presence and capacity to promote learning opportunities in both urban and rural communities. It was found that most of the communities are not taking opportunities of KNP resources to build communities. It was found that people who visited the SHRC were prepared to use resources for capacity building. This study found the SHRC seeks partnerships that offer much needed implementation capacity, guidance in using best practices, access to education and support for community engagement. The learning programme within the SANParks gave an opportunity for everyone to fully participate.

Adoption of information communication technology

The long-term preservation of ALM resources was regarded as the major challenge for those who were interviewed because most of ALM has different formats and contents. This was so because of high pressure with regard to capturing, maintaining and preserving a rapidly growing body of information resources. The lack of a collection management policy has an impact on the development and implementation of a digitisation process because ALM resources are unique and require different formats and structures to be preserved. A plan is to be put in place for an internal alliance of departments within the KNP to enhance access to information to ALM collections through the introduction of the electronic content management system. This statement is alluded to by Netshakhuma (2018a, 2018b, 2019) who indicated that the introduction of an electronic content management system and business management process enhances access to information.

Aspects of capacity building in ALM deserve urgent attention from the KNP. This means that management are to be encouraged to learn new skills in the preservation of artefacts and modern technology. However, some of the participants felt that alliance efforts for ALM may be a threat to autonomous or unique tradition of ALM professions. The researcher assumed that technology will enhance users' ability to differentiate between archives, museums and libraries.

Recommendations

Based on the findings, the researcher recommends the following:

- ❖ The Department of South Africa Higher Education and Training should consider introducing field trips to Kruger National Park as part of educational activities to promote the use of ALM.
- ❖ The KNP needs to adopt a pro-active stance towards community outreach and development. Communities should benefit from the ALM programme. Such initiatives will encourage communities to visit SANParks for educational purposes and other activities.
- ❖ ALM functions should strive to remain relevant and meaningful to the South African society and meaningful to the society they purport to serve.
- ❖ Organisations should develop a collection management policy to drive the management information resources.
- ❖ The KNP should provide scholarships for young people to study history and cultural heritage in order to promote preservation and conservation of national parks system.
- ❖ KNP to involve in digitisation projects to ensure that museums, libraries and archives resources are used to their maximum.
- ❖ Alliance initiatives should be aligned with institutional priorities, resource investment and professional responsibilities are important to success for cross-disciplinary and collaborative professional development.
- ❖ ALM should continually work to seek opportunities to collaborate and cultivate relationships to enhance patron experience.

Conclusion

ALM forms an essential part of the country's memory hence there are legislations enacted to preserve and educate the nation about the importance of ALM functions. The ALM functions help in bridging the past and the present and in the shaping of the country. It seems that ALM were deemed to have been neglected by KNP and to suffer from lack of leadership and coordination. Linking all ALM offered by KNP will create positivity with cultural heritage. The technological innovation process in the ALM sector is to be marked by interoperability, use of ontologies, multimedia, mobile and wireless technologies and web design functionality and usability, accessibility

and ambient intelligence. The low use of technologies in KNP is related to the fragmentation of the national parks and the features that characterise them, such as lack of budget, lack of awareness of ICT benefits, lack of skills and capabilities. The lack of assistance and accompaniment for organisations facing the process of technology adoption. The KNP mission is to develop a public private alliance that delivers the benefits of a network system to the national system within a sound commercial business model.


Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Nkholezeni Sidney Netshakhuma  <https://orcid.org/0000-0003-0673-7137>

References

- Alegbelaye MO (2013) Reading for national development: Catching them young. *Nigerian School Library Journal* 12: 75–82.
- Anderson J (2005) Access and control of indigenous knowledge in libraries and archives: Ownership and future use. In: *Correcting course: Rebalancing copyright for libraries in the national and international arena*, Columbia University, New York, 5–7 May 2005. Washington, DC: American Library Association and The MacArthur Foundation. Available at: <https://nyuscholars.nyu.edu/en/publications/access-and-control-of-indigenous-knowledge-in-libraries-and-archi> (accessed 28 February 2020).
- Caidi N (2005) Building 'civilisational competence': A new role for libraries. *Journal of Documentation* 62(2): 194–212.
- Chaterera F (2015) Heading for a better understanding of outreach in the digital age: A look into the use of Web 2.0 as a communication tool by state museums and archives in Zimbabwe. *Journal of South African Society of Archivists* 48: 21–23.
- Delaney B and De Jong A (2015) Media archives and digital preservation: Overcoming cultural barriers. *New Review of Information Networking* 20: 73–89.
- Diamant-Cohen B and Sherman D (2003) Hand in hand: Museums and libraries working together. *Public Libraries* 42(2): 102–105.
- Doerr M (2003) The CIDOC Conceptual Reference Module: An ontological approach to semantic interoperability of metadata. *American Archivist* 24(3): 75–92.
- Doerr M, Bekiari C and Le Boeuf P (2008) FRBR_{oo}, A conceptual model for performing arts. In: Annual

- conference of CIDOC, Athens, Greece, 15–18 September 2008. Available at: https://publications.ics.forth.gr/_publications/drfile.2008-06-42.pdf (accessed 27 July 2020).
- Duff WM, Carter JC, Cherry JM, et al. (2013) From co-existence to convergence: Studying partnerships and alliance among libraries, archives, and museums. *Information Research* 18(3).
- Gergatsouls B, Bountouri L, Gaitanou P, et al. (2010) Mapping cultural metadata to CIDOC Conceptual Reference Model. In: *Hellenic conference on artificial intelligence*. Berlin; Heidelberg: Springer, pp. 321–326.
- Gibson H, Morris A and Cleeve M (2007) Links between libraries and museums: Investigating museum-library alliance in England and the USA. *Libri* 57(2): 53–64.
- Gill T (2004) Building semantics bridges between museums, libraries and archives: The CIDOC Conceptual Reference Model. *First Monday* 9(5).
- Goerz G, Schiemann B and Oischiger M (2008) An implementation of the CIDOC Conceptual Reference Model (4.2.4) in OWL-DL. In: *Annual conference of CIDOC*, Athens, Greece, 15–18 September 2008. Erlangen: University of Erlangen-Nuremberg.
- Gwinn EN (2009) LAMMS and international alliance. In: *Scientific symposium changing world, changing views of heritage: The impact of global change on cultural heritage – Technological change. ICOMOS scientific symposium. Theme 1: Documentation*, Valletta, Malta, 7 October 2009.
- Hildreth S (2006) Developing partnerships for free choice learning. *Public Libraries* 45(5): 7–11.
- Innocent N (2009) *How Museums, Libraries and Archives Contribute to Lifelong Learning*. IFLA Sector paper 10. Leicester: National Institute of Adult Continuing Education (NIACE).
- Jones M (2016) Documenting things: Bringing archival thinking to interdisciplinary alliances. *Australian Library Journal* 65(3): 213–223.
- Kalfatovic RM, Spiess KP, Van Camp A, et al. (2008) Smithsonian Team Flickr: A library, archives and museums collaboration in Web 2.0 space. *Archival Science* 8(4): 267.
- Katre D (2012) Need of legislation and digital preservation policy framework in Indian context. *DESIDOC Journal of Library and Information Technology* 32(4): 321–326.
- Klimaszewski C (2015) Lumping (and splitting) LAMs: The story of grouping libraries, archives, and museums/Regroupement (et division) des BAMs: Histoire du regroupement des bibliothèques, des archives et des musées. *Canadian Journal of Information and Library Science* 39(3): 350–367. *Project MUSE* muse.jhu.edu/article/598450.
- Ledwaba St (2016) SANParks reaches out to communities through library week. *Go Wild. South Africa National Parks Newsletter*, March/ April.
- Lei MZ (2019) Semantic enrichment for enhancing LAM data and supporting digital humanities. *EL professional de la information* 28(1): e280103.
- Lo P, But K and Trio R (2014) Links between libraries and museums: A case study of library-museum collaboration at the Hong Kong Maritime Museum. *JLIS.IT*. 5(1): 8916.
- Mabunda DM (2003) *An integrated tourism management framework for the Kruger National Park, South Africa*. PhD Thesis, University of Pretoria, South Africa.
- Netshakhuma N (2019f) Analysis of archives infrastructure in South Africa: Case of Mpumalanga provincial archives. *Global Knowledge, Memory and Communication*. DOI: 10.1108/GKMC-03-2019-0043.
- Netshakhuma N (2019g) Assessment appraisal, disposal and transfer of neglected rangers' diaries created from 1926 to 1930: Case of the Kruger National Parks of South Africa. *Collection and Curation*. DOI: 10.1108/CC-09-2019-0029.
- Netshakhuma N (2019h) Analysis of South Africa universities and communities archives. *Global Knowledge, Memory and Communication* 68(8/9): 635–651.
- Netshakhuma NS (2016) *An exploration of the digitisation strategies of the liberation archives of the African National Congress in South Africa*. Master's Thesis, University of South Africa, Pretoria, South Africa.
- Netshakhuma NS (2017) The role of archives on the incorporation of the former Kangwane homeland into Mpumalanga province. *Africanus* 47(2): 1–16.
- Netshakhuma NS (2018a) Assessing the appraisal, disposal and transfer of records from 1994 to 2014: The case of Mpumalanga Provincial Government in South Africa. *Mousaion* 36(2): 1–20.
- Netshakhuma NS (2019b) Assessment of a South Africa national consultative workshop on the Protection of Personal Information Act (POPIA). *Global Knowledge, Memory and Communication*. DOI: 10.1108/GKMC-02-2019.
- Netshakhuma NS (2019c) The role of archives and records management legislation after colonialism in Africa: Case of Southern Africa. *Records Management Journal* 29(1/2): 210–223.
- Netshakhuma NS (2019d) Assessment of the status of the social media records: The case of the Mpumalanga Government, South Africa. *Journal of Archival Organization* 16(4): 178–198.
- Netshakhuma S (2018b). Capacity building through digitisation: Case of the ANC archives. *IQ: The RIM Quarterly* 34 (2): 38–42.
- Netshakhuma S (2019a) An analysis of the implementation of an enterprise content management system: a pilot project of the South African national parks *Innovation* 58(June): 53–77.
- Netshakhuma S (2019e) The blurry line between archives and records management at the universities in South Africa. *South Africa Society of Archivists Journal* 52: 61–69.
- Ngoepe M and Ngulube P (2011) Assessing the extent to which the National Archives and records Service of South Africa has fulfilled its mandate of taking the archives to the people. *Innovation* 42: 4–22.

- Novia J (2012) Library, Archival and Museum (LAM) Alliance: Driving forces and recent trends. *Endnotes: The Journal of the New Members Round Table* 3(1).
- Olatokun MW (2008) A survey of preservation and conservation practices and techniques in Nigerian university libraries. *Libres: Library and Information Science Research Electronic Journal* 2.
- Pitti D, Hur R, Larson R, et al. (2015) Social networks and archival context: From project to cooperative archival program. *Journal of Archival Organization* 12: 77–97.
- Popoola SO (2003) *Preservation and Conservation of Information Resources*. University of Ibadan, Nigeria: Distance Learning Centre.
- Rinehart R (2013) (3AD) MOAC: A report on integrating museum and archive access in the Online Archive of California. *D-Lib Magazine* 2(9): 1.
- Samouelian M (2009) Embracing Web 2.0: Archives and the newest generation of Web applications. *American Archivist* 72(4): 2–71.
- Sandwith TS and Pfothenhauer M (2002) Maloti-Drakensberg: Trans frontier conservation and development. In: Pearce SM, Cowling RM, Sandwith T, et al. (eds) *Mainstreaming Biodiversity Development: Case Studies from South Africa*. Washington DC: The World Bank Environment Department, pp. 129–141.
- Sanjuan FI and Menard E (2015) Preface: Archives, libraries, and museums and the era of the participatory social web. *Canadian Journal of Information and Library Science* 39: 3–4.
- Satgoor U (2015) Celebrating libraries in 20 years of democracy: An overview of library and information services in South Africa. *IFLA Journal* 41(2): 97–111.
- Sirinides P and DuBois T (2017) A study of early learning services in museums and libraries. *Early Childhood Education Journal* 45: 563–573.
- South African National Parks (2019) *Annual Performance Plan Financial Year 2018/2019*. Pretoria: South African National Parks.
- Swan DW, Arturo MC, Miller KA, et al. (2013) *Public Libraries in the United States Survey: Fiscal Year 2013*. Washington, DC: Institute of Museum and Library Services.
- Timms K (2009) New partnerships for old sibling rivals: The development of integrated access systems for the holdings of archives, libraries, and museums. *Archivaria* 68 (Fall): 67–95.
- Ubisi A (2014) KNP rewards hardworking individual Kruger News. *Go Wild. South African National Parks Newsletter*, May/June.
- Usherwood B, Wilson K and Bryson J (2005) Perceptions of archives, libraries, and museums in modern Britain. *Library & Information Research* 29(93): 50–57.
- Van der Elst J, Richards-Rissetto H and Garcia J (2011) Creating digital heritage content bridging communities and mediating perspectives. In: Lytras M, De Pabso O, Damiani E, et al. (eds) *Digital Culture and E-Tourism Technologies, Applications and Management Approaches*. Hershey, PA: IGI Global, pp. 139–157. Available at: https://digitalrepository.unm.edu/la_energy-dialog/38 (accessed 27 July 2020).
- Waibel G and Erway R (2009) Think global, act local: Library, archives, and museum collaboration. *Museum Management and Curatorship* 24(4): 323–335.
- Wamukoya J and Mutula SM (2005) E- records management and governance in East and Southern Africa. *Malaysian Journal of Library & Information Science* 10(2): 67–83.
- Wythe D (2007) New technologies and the convergence of libraries, archives and museums. *RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage* 8(1): 51–55.
- Yarrow A, Clubb B and Draper JL (2008) *Public Libraries, Archives, and Museums: Trends in Alliance and Cooperation*. IFLA Professional Reports No. 108. The Hague: IFLA.
- Zaid Y and Abioye A (2010) Museums, libraries and archives: Collaborating for the preservation of heritage materials in Nigeria. *African Research & Documentation* 114: 59–71.

Author biography

Sidney Netshakhuma is a Deputy Director Records and Archives at the University of Mpumalanga in South Africa. Prior to this position, Mr Netshakhuma worked for the South Africa Public Service for a period of 12 years as Deputy Manager Information and Records Management, SAN-Parks as the records manager and the African National Congress as the archivist. Mr Netshakhuma holds a BA (History and Political Studies), BTECH (Archival Studies), BPHIL (Honours) Information and Knowledge Management, Postgraduate Diploma in Records and Archives Management, Postgraduate Diploma in Heritage and Museum Studies, Advance Certificate in Records and Archives Management, Master of Information Science from the University of South Africa and he is currently enrolled for doctoral programme in archives and records management at UNISA. He served as the Advisory committee member of UNISA Centre for Applied Communication (Records and Archives Management), He is currently a Deputy Chairperson of the South Africa Higher Education Records Management Forum. He also served as the advisor (Reference Group for the Mpumalanga Records Management Forum.



Copyright literacy of library and information science professionals in Bangladesh

International Federation of
Library Associations and Institutions
2021, Vol. 47(1) 78–90
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0340035220904067
journals.sagepub.com/home/ifi



Zakir Hossain

ICS Inter-Community School Zurich, Switzerland

Abstract

Library and information science (LIS) professionals often act as default copyright mavens at their institutions and, therefore, must have an awareness of copyright law and practices. Using a quantitative national survey: ‘Copyright Literacy of Bangladeshi LIS Professionals’ which was part of a multinational survey entitled ‘Copyright Literacy of specialists from libraries and other cultural institutions’, the main objective of the Bangladesh part was to illustrate the self-perceived familiarity with, knowledge and awareness of, and opinions about copyright-related issues of LIS professionals in Bangladesh. The survey also explored the existing institutional copyright policies, the need for copyright education for new and existing professionals and suggested topics for inclusion in training activities. The results show that Bangladeshi LIS professionals have conceptual knowledge and awareness of copyright issues, but overall lack an applied approach and hands-on training. This weakness is even more pronounced among LIS professionals who work in non-academic institutions. Based on these findings, it is suggested that relevant workshops, seminars and roundtable meetings focusing on copyright be organized that will pave the way for continued knowledge development around this topic.

Keywords

Bangladesh, copyright, copyright literacy, Intellectual Property Rights (IPR), librarian, library

Submitted: 17 November 2019; Accepted: 11 January 2020.

Introduction

Copyright is part of the wider body of law known as Intellectual Property Rights (IPR). The term ‘copyright literacy’ was used by the originator (Tania Todorova) of the multinational survey ‘Copyright Literacy of specialists from libraries and other cultural institutions’,¹ and is part of a wider recognition that there is an increasing range of knowledge, skills and behaviors that individuals require when working with copyright content in the digital age.

Morrison and Secker (2015: 211) define copyright literacy as ‘acquiring and demonstrating the appropriate knowledge, skills and behaviors to enable the ethical creation and use of copyright material’. They recognized that copyright literacy pertains to not only accumulating knowledge about copyright but also practicing associated skills and behaviors to enable that material to be used effectively. The International

Federation of Library Associations and Institutions (IFLA) (2018a) stated that copyright literacy includes understanding the structure, functioning and implications of the copyright system, as laws, practices and user expectations evolve.

As a result of recent developments in information formats and the open access movement, everyday copyright law affects the way libraries provide information to their users and every outcome can directly affect the future of libraries (American Library Association (ALA), 2019) and libraries face more and more complicated intellectual property and copyright issues than in the past. Traditionally, libraries are

Corresponding author:

Zakir Hossain, ICS Inter-Community School Zurich, Strubenacher
3, 8126 Zumikon, Zurich, Switzerland.
Email: zakir.researchtl@gmail.com

leaders in trying to maintain a balance of power between copyright holders and users or at the very least advocate for intellectual freedom and promote access to information (Nilsson, 2015) in keeping with the fundamental principles outlined in local and international constitutions over the years. However, the ALA (2019) stated that the digital age presents new challenges to fundamental copyright doctrines that are the legal cornerstones of library services. Copyright laws around the world are constantly changing in an attempt to adapt – or react – to the digital world or to address new technologies as electronic resources come to represent a larger percentage of libraries' resources and services. Most importantly, the changing landscape of information acquisition, storage, use and reuse has a profound impact on copyright laws and intellectual properties. These changes can have a major impact on how libraries function and on the public service they provide and librarians are the first port of call for advice on copyright and IPR matters.

As traditional skills and aspects of librarianship have changed, partly due to the complex development of scholarly communication, digital collections, and the demands of new services related to e-resources, publishing and copyright, librarians often do not feel confident in their knowledge about copyright and are, therefore, hesitant to take on this new role (Nilsson, 2015). Not only are librarians, as professionals, bound to uphold the values and ethics of our profession of which copyright is one, but it is our role to protect the copyright of those who allow us, as a public service, to lend their property to others. To do this, librarians and other information management professionals need to be copyright literate, in order to both carry out their own functions and duties, and to support colleagues and users in the most effective way possible (IFLA, 2018b). Hence, there is a need for basic knowledge and for staying up-to-date on new developments about copyright and it is crucial to continue to address the emerging challenges posed at the intersection of technology, society and law.

To address these knowledge demands, there are a variety of learning opportunities for library and information science (LIS) professionals and ways to support them in keeping current professionally. IFLA, for example, released a 'Getting Started' guide (<https://www.ifla.org/publications/node/71175>) for librarians in countries where a Treaty has been implemented, helping them to make full use of its provisions. Since 2016, Chris Morrison of the University of Kent, Jane Secker of City, University of London, together with Tania Todorova of University of Library Studies and Information Technologies, Sofia have developed a

dedicated webpage (<https://copyrightliteracy.org/about-2/international-copyright-literacy/>) making visible and accessible the results of the international research collaboration that act as a focus for disseminating research, publications, presentations, seminars, symposiums and news items from the international copyright literacy community of practice in Europe and beyond. In the US, the Library of Congress and the ALA have long been conducting research on the impact of copyright law and policy and have offered guidelines to libraries and related information institutions (Association of Research Libraries (ARL), n.d.). According to Nilsson (2015), there are many developments in the field of librarianship which serve to educate patrons about copyright issues including national, regional and international copyright webinars and thematic workshops, online tutorials and courses, education programs in LIS, participation in conferences and discussion lists, collaboration with other copyright professionals and library organizations and self-directed learning and self-training.

The Bangladesh context

Copyright law in Bangladesh originated from British copyright law (Khondker and Nowshin, 2013) and later, the 1972 constitution of Bangladesh in articles 40 and 42 which guaranteed a citizen's right to property (Naznin, 2011). Following this, the Bangladesh Copyright Act 2000 was enacted in 2000 and was amended in 2005. Bangladesh participated in the convention establishing the World Intellectual Property Organization (WIPO) in 1985. It became a member of the Paris Convention for the Protection of Industrial Property in 1991 and the Berne Convention for the Protection of Literary and Artistic Works in 1999. Bangladesh is a signatory state of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement under the World Trade Organization (WTO), which came into force in 1995 (Ahmed, 2016). The Copyright Office under the Ministry of Cultural Affairs (MOCA) and matters related to copyright and related rights are administered by this office. To proliferate intellectual innovation and creativity in the country, the Government of Bangladesh also established the Department of Patents, Design and Trademarks under the Ministry of Industries.

In Bangladesh, copyright is a subject matter of statutory protection of intellectual property. Copyright is protected for original intellectual works of literature, art, music, software, etc. Under the Copyright Act (amended in 2005), copyright exists up to 60 years after the death of the copyright owner (Khondker and Nowshin, 2013) and registration is optional. To

address copyright issues around new digital resource formats such as data, source code, tables, charts, graphs, sounds and music, still and moving images, designs text, folk knowledge and culture, Saha (2017) reported that Bangladesh drafted a new copyright law (Copyright Act 2017) and launched an 'e-Copyright system' to make it easier for anyone to copyright their intellectual property.

Despite the initiatives mentioned, the protection and enforcement of copyright and related rights in Bangladesh is still a great concern. Hosen (2017) claimed that the general public is not even aware of what copyright actually means, partly due to the lack of consciousness and execution of copyright laws, and that the actual authors are not receiving any benefits from their intellectual work even though we have the Copyright Act 2000. Moreover, although Bangladesh enacted the Copyright Act so as to comply with the obligations under the TRIPS agreement and for the benefit of sustainable socio-economic development of the country, no extensive skill or training program on copyright is available at any government training institutions in Bangladesh (Khondker and Nowshin, 2013). In fact, according to a Government Draft Report (Uddin, n.d.), the Copyright Office does not have its own premises and currently occupies a portion of the National Archive Office. It does not have regional offices and there are no institutional arrangements with any district-level organization or department to provide regional services. Similarly, the Department of Patents, Design and Trademarks staff has limited technical and legal knowledge on IPR issues, operates in an inadequate office space and does not have a separate library for preserving records.

Literature review

Libraries and other cultural institutions play an important role as a balance point between two major components in the copyright equation: respecting the rights of 'information owners', and 'information users' (Todorova et al., 2017). Balanced copyright law is critical to libraries being able to fulfill their missions of preserving and providing access to the cultural and historical records (ARL, n.d.) regardless of their setting. In particular, scholars have confronted the challenges posed by libraries seeking to collect eBooks (McKenzie, 2013), music acquired from services such as iTunes (Pessach, 2008), video recording and streaming (Schmidt, 2019) such as Spotify, open-access resources, research data management and sharing. Collecting and sharing these popular materials is increasingly 'essential to university-level classes' (King, 2014: 293) and for attracting patrons to the library (Cross, 2016).

Libraries often pay for access to, not ownership of content, and that content will only be available as long as the publisher/provider's status and catalog remain the same (Schmidt, 2019). Cross (2012) pointed out that as nonprofit institutions that serve the public good, libraries make many uses that fit comfortably under the aegis of fair use. In short, libraries should use all possibilities provided by the law to give access and enable learning. To do this, librarians and other information workers need to be copyright literate, in order to both carry out their own functions and duties and to support colleagues and users, in the most effective way possible. The Consortium of Academic and Research Libraries in Illinois (CARLI) (2014) recommend that libraries and librarians make sure that they have the infrastructure and technical ability to create the streaming copy, host it, and provide the security necessary to restrict further dissemination.

LIS professionals and those who work in related sectors are increasingly challenged by copyright issues. This is particularly apparent with the shift towards delivering traditional services such as inter-library loans and core readings for students in digital format (Morrison and Secker, 2015) and recently the open access movement. The twin trends of globalization and digitization have made the challenge acute. In a globalized world, researchers, students and even ordinary citizens expect to be able to access information without being confronted with national borders (IFLA, 2018a). Yet a WIPO study shows that libraries and archives work under a patchwork of provisions that differ in scope and influence from country to country, making cross-border working unnecessarily complicated (Crews, 2015). At the same time, the shift to digital formats has allowed a much greater degree of control over what libraries and their users can and cannot do with the materials to which they have access. This can threaten their traditional roles of providing access to knowledge and preserving our cultural and scientific heritage (IFLA, 2018a).

In its Statement on Copyright Education and Copyright Literacy, IFLA (2018b) pointed out that developing and updating copyright literacy requires copyright education. Todorova et al. (2017) summarized in their multinational studies on copyright that it is essential for LIS professionals to develop high levels of copyright literacy (knowledge and skills) and the ability to implement institutional copyright policy. Traditionally, professional qualifications in this sector have included an awareness of copyright law as part of the wider legal framework in which organizations operate (Morrison and Secker, 2015). While not attorneys, librarians have developed an awareness and

understanding of copyright law, legislation and practice as they relate to a wide variety of library activities.

Crews (2012) explains copyright law in the context of education, research, and librarianship. He breaks down copyright law and concentrates much of his discussion on the built-in statutory exceptions that particularly apply to educators and librarians such as fair use, library copying, distance learning, computer software, architectural works, and special formats for persons who are blind or have other disabilities. Thereafter, Nilsson (2015) listed some fundamental competencies for LIS professionals in the field of copyright/IPR which includes: rights, exceptions (fair use) and limitations, database licensing and digitized course material, operating institutional repositories, creative approaches and alternatives including Creative Commons. Open educational resources, open and research data management and sharing could also be added to Nilsson's list as emerging trends in scholarship and in librarianship where copyright is vital. LIS professionals, those who deal with copyright and IPR, should take the first step by engaging with these emerging areas to meet their mission in a way that honors the core legal principles that have always supported librarianship in the service of society.

Copyright concerns often arise among those working in a library and basic knowledge of copyright features in most library professional qualifications (Secker and Morrison, 2016). Prior to the 'Multinational Copyright Literacy Survey 2012–2017' (see details at <https://copyrightliteracy.org/about-2/international-copyright-literacy/>), there had previously been little research examining copyright knowledge either in the wider education community or in the library and information profession (Morrison and Secker, 2015). Olaka and Adkins (2012) carried out a study on copyright knowledge of academic librarians in Kenya that was prompted by the growing role for librarians to educate library users about copyright issues in light of increasing infringement. In the UK, a survey by Oppenheim and Woodward (2004) is perhaps of greatest relevance, for it investigated copyright advice and guidance services offered by UK libraries.

Despite its significant importance, the literacy level around copyright and related issues of LIS professionals has been explored by only a few studies (Naheem, 2017) and in Bangladesh, no related study has been undertaken as of 2019. The survey 'Copyright Literacy of Bangladeshi LIS Professionals', is therefore of great significance in order to explore whether the level of copyright literacy of Bangladeshi library professionals is up to standard. If not, this could provide

opportunities for collaboration between library professionals and educators, in order to embed copyright and wider intellectual property rights issues into course curricula at both continuous and higher education levels. Librarians, LIS faculty, educators, researchers and other local and global readers will also benefit from this research regarding their copyright expertise.

The objective of the survey

The main objective was to explore the copyright literacy of Bangladeshi LIS professionals. The subsequent objectives were:

- to comprehend the knowledge and awareness of Bangladeshi LIS professionals pertaining to copyright and IPR;
- to gather the current practice and views of respondents regarding institutional level copyright policy;
- to understand LIS professionals' opinions concerning copyright/IPR subject matter in formal (Bachelors & Masters) and continuous LIS education.

Methodology

To be able to explore the copyright literacy of Bangladeshi LIS professionals, a quantitative web-based survey was conducted using a Google form adapted from an international research project called 'Copyright Policies of Libraries and Other Cultural Institutions'¹ during November 2018 to January 2019. The same survey was conducted in many other countries, namely Bulgaria, Croatia, Finland, France, Hungary, India, Lithuania, Mexico, Norway, Portugal, Romania, Spain, Turkey, United Kingdom and the United States of America in the period 2012–2017 using the same questionnaire.

The questionnaire included 22 questions, most of which had closed response options, and was divided into four sections. The first part of the survey aimed to establish the knowledge and awareness of the respondents on issues of copyright. Part two then explored the opinions of the respondents towards institutional level copyright policy. Section three examined attitudes towards formal copyright education and continuous education, for example in library, archival and cultural heritage professional qualifications. Finally, the last section gathered demographic information including age, gender and educational and professional experience of the respondents. The survey included closed, Semi-open (utilizing a 5-point Likert scale) and open-ended questions.

To make the survey more comprehensive and user-friendly for the non-native participants, the questionnaire was partly translated (mostly questions, not the response options) into Bengali by a professional translator. There were a few minor amendments undertaken for the Likert scale-based questions, too. For example, instead of ‘Not Familiar, Slightly Familiar, Somewhat Familiar, Moderately Familiar, Extremely Familiar’ this study used ‘Low, Moderate, Good, Very good, Excellent’. Also, ‘Uncertain’ was substituted with ‘Unsure’. Then the online questionnaire was shared with the target population: the LIS professionals of Bangladesh on professional mailing lists and on Facebook groups.

Completed responses were received, automatically recorded and tabulated through Google Forms. For open-ended questions, respondents submitted comments in English, which therefore did not require any further translation. Descriptive statistics were used to analyze the findings and Chi-square tests of independence were applied to compare various factors. Some respondents opted not to respond to all survey questions. The missing responses are reflected in the varying sample size (n) values. Respondents from one school and one public library are included in ‘Other’ ($n = 4$) for the ease of data analysis.

In addition to this, in-depth desk research was conducted via Google, Google Scholar, EBSCO and JSTOR databases using Bengali and English keywords, e.g. ‘Copyright law in Bangladesh’; ‘Librarian AND copyright law AND Bangladesh’; ‘Intellectual Property rights in Bangladesh’ and ‘Copyright AND Intellectual Property rights in Bangladesh’. Some of these keywords were combined using the Boolean operator ‘AND’ for retrieving related information. Diverse project reports from IFLA, WIPO, the National Library of Bangladesh, the Bangladesh Copyright Office, and local Bengali and English newspapers were consulted. Overall, there was no identifiable primary literature related to copyright/IPR literacy of Bangladeshi LIS professionals.

Results and data analysis

The bulk of the survey asked respondents to rate their perceived familiarity with different areas of copyright, at both national and international levels. More than 80% of respondents felt they were at least somewhat aware of copyright issues, while more than half felt they had a moderate to a very good level of awareness. Nearly half (48.3%) of the respondents acknowledged that they were ‘very much’ interested in the initiatives of national and international libraries and other professional associations on issues related to copyright/IPR. On the whole, however,

respondents were much more familiar with national copyright issues than they were with international copyright/IPR. More than 90% were at least somewhat familiar with national copyright law, and more than 56% with the national copyright institutions.

Respondent profiles

The survey, which targeted one person from each institution in order to avoid duplication, produced 60 responses. Therefore, the 60 respondents in this survey represented 60 institutions. The institutions are broken down according to sector: 28 private university libraries (out of 103 private universities in Bangladesh), 12 public university libraries (out of 45), nine special libraries, four college² libraries, three LIS faculties from public universities, one school library, one public library and two identified themselves as ‘others’. Most questions were not mandatory, and not all participants responded to all questions. Thus, the statistics below are based on the total number of respondents per question. Therefore, caution should be applied to this data given the lower number of responses from some sectors such as school and public libraries. Although the highest number of Bangladeshi LIS professionals work in the school library system (about 12,198 as cited in Hossain, 2019) the number of responses received from this group was not satisfactory. The possible reason for the poor participation by the school and public library professionals could be that they are rarely confronted with copyright/IPR issues in their day-to-day work.

A higher percentage of survey respondents were male (75%) compared to females (25%) which is quite the opposite to global LIS professionals gender ratio as library occupations are predominantly held by women (Department for Professional Employees (DPE), AFL-CIO, USA), 2019; Hossain, 2017, 2019; Beveridge et al., 2011 as cited in Hossain, 2017). With respect to age, the largest group (48.3%) was in the range between 30 and 39 years, followed by those younger than 30 years (26.7%), and those from 40 to 49 years (21.7%) while those between 50 and 60 years constitute only 3.3%. Regarding the highest degree that respondents have, the vast majority have a Master’s degree (86.7%) and most (66.7%) of the respondents work in university libraries both public and private.

General knowledge and awareness of copyright

The first section of the survey explored the general level of knowledge and awareness of a variety of copyright issues. Respondents were asked to comment on their overall familiarity with copyright/IPR issues using a 5-point Likert scale ranging from 1

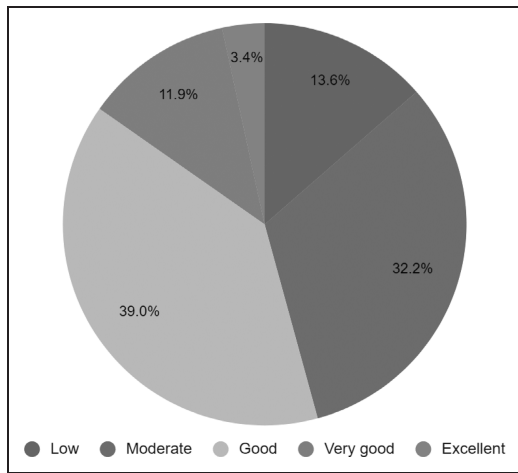


Figure 1. LIS professionals' general copyright awareness level (n = 59).

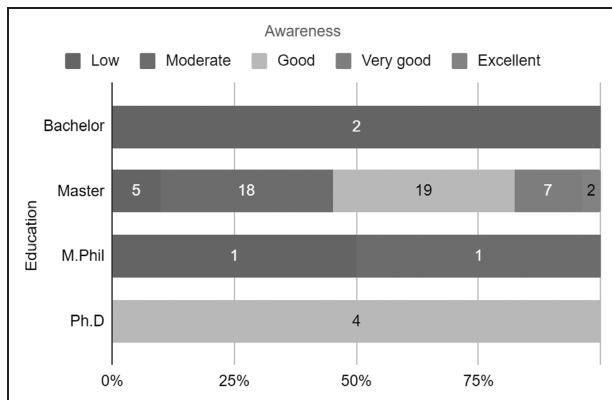


Figure 2. Education vs general copyright/IPR awareness level (n = 59).

(Low) to 5 (Excellent). Out of 59 survey respondents, 39% indicated a good awareness level of copyright, 34% indicated a moderate awareness, and 13.6% of respondents indicated a low awareness level. The remaining 15% of respondents indicated very good and excellent awareness levels as presented in Figure 1. The obvious lack in awareness concerns copy-left,³ Creative Commons, out-of-print and orphan works. Surprisingly, many of the participating LIS professionals in Bangladesh had a good familiarity with some emerging topics such as licensing, digitization and institutional repositories.

Figure 2 compares the education levels and copyright/IPR awareness of 59 respondents which ranges from Bachelor to Doctoral degrees with the bulk concentrated at the Master's level (86.7%), followed by PhD (6.7%). Data analysis shows that generally, Master's degree holders have 'Good' awareness about copyright/IPR. All but two respondents at the Bachelor's level indicated only a low level of copyright literacy. Does this mean that LIS schools in Bangladesh have less focus on copyright/IPR

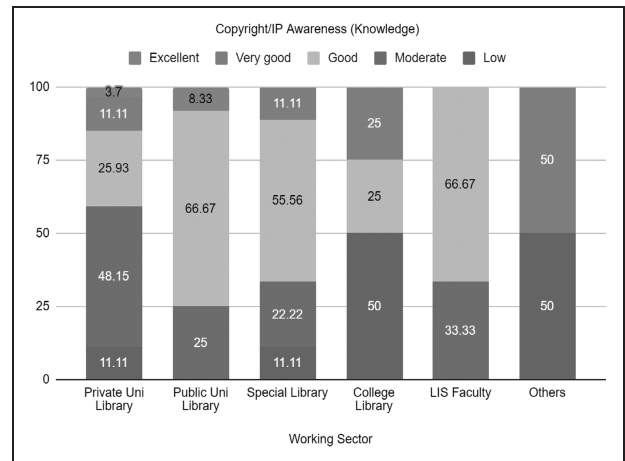


Figure 3. Participants' working sector vs their copyright/IPR literacy (n = 59).

issues at the Bachelor degree level? The respondents at the Master's level are spread throughout the 5-point Likert scale (Low, Moderate, Good, Very Good and Excellent) with the highest concentration almost equally divided between moderate (34.6%) and good (38.4%) awareness of copyright. A few Master's degree holding respondents indicated that their awareness levels are 'Very good' (9.6%) and 'Excellent' (3.8%).

Knowledge of copyright policies and procedures was examined across library sectors – private, public, special and college – as well as LIS faculty and 'Others' using a 5-point Likert scale. What is curious is that four times the number of respondents with a moderate knowledge of copyright/IPR are employed in private university libraries (48.15%). Most of the public universities and special library professionals claimed 'good' awareness of copyright/IPR. The remainder of the respondents are scattered in the single digits in their copyright awareness across the sectors. Across all respondents in this category, only three LIS faculty possess 'moderate' to 'good' awareness of copyright/IPR policy as detailed in Figure 3.

Familiarity with copyright

Using the same 5-point Likert scale, survey participants were asked to indicate their perceived knowledge and awareness of the following issues:

- copyright law at a national and international level;
- familiarity with licensing, fair use and exceptional issues;
- copyright-related institutions at a national and international level;
- familiarity with licensing, fair use and exceptional issues.

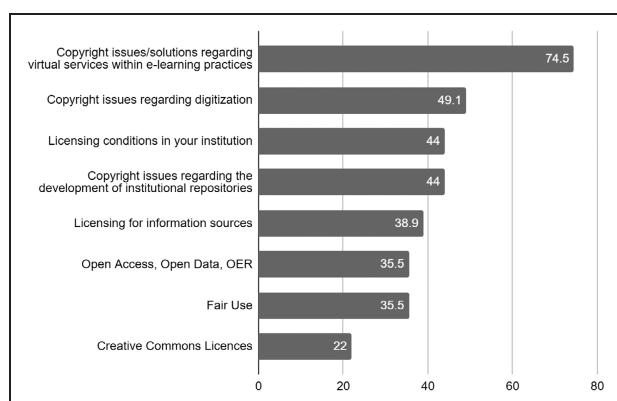


Figure 4. Familiarity with licensing, fair use and exceptional issues (n = 59).

Familiarity with Bangladesh National Copyright Act (legislation)

To explore the familiarity, knowledge and awareness of national copyright policy, respondents were asked if there was a national policy on copyright in Bangladesh, and 88.1% of respondents were sure of its existence and 11.9% were unsure. Concerning national copyright legislation (Bangladesh Copyright Act):

- 67.6% of respondents knew the duration of copyright protection;
- 48.6% were aware of exceptions for private use, educational, scientific and research purposes;
- 44.9% knew the exceptions for libraries, educational institutions, museums and archives;
- 29.7% of the respondents were aware of the existence of the rights for librarians to provide modified copies of works to serve the needs of visually impaired patrons;
- 21.6% knew the existence of orphan works (e.g. compulsory license or limitation of liability)

Familiarity with licensing, fair use and exceptional issues

Figure 4 represents familiarity with copyright related to licensing, fair use and exceptional issues. An equal number of respondents (44%), indicated a familiarity with licensing conditions at their institutions and with copyright requirements for developing institutional repositories. Surprisingly a good number of respondents indicated their familiarity with two emerging areas: namely copyright issues or solutions regarding virtual services within e-learning practices (74.5%) and copyright issues regarding digitization (49.1%) although these are fairly new to Bangladeshi LIS professionals. The obvious lack of awareness are Creative Commons licenses (22%) and fair use guidelines

(35.5%), and they are crucial to the work of teaching, institutional repositories, and research data sharing.

The survey explored how respondents kept up to date with copyright/IPR issues in the context of their work. Figure 5 confirms that, in Bangladesh, for copyright-related advice, LIS professionals primarily rely on experts from the academic community (69%), national library and professional associations (59%), followed by international associations such as the International Council of Museums (ICOM) (49%), International Council on Archives (ICA) (44%), IFLA (44%) and WIPO (41%). In general, respondents seem much more interested in getting advice from professionals than reading books, articles, websites or taking advice from colleagues and lawyers. This data demonstrates the important role of professional associations to provide information on copyright-related issues in Bangladesh. However, results from other survey participant countries, for example, UK (76%), France (77.5%) and India (82.29%) show that LIS professionals of those countries primarily use websites as a primary source of information related to copyright/IPR.

Copyright policy at an institutional level

Institutional-level copyright issues and policies were explored in this survey. Respondents were asked whether their institutions owned resources protected by copyright, whether they believed libraries should have a copyright policy and whether there was someone responsible for copyright issues in their institution. Over 70% of respondents answered that their institution had resources protected by copyright and thought that institutional copyright policy was necessary for libraries and other cultural institutions. Although it is necessary to have an institutional copyright policy, almost half of the respondents reported that their institutions did not have one.

Additionally, 40% responded that their institutions had put copyright/IPR policy in place and, surprisingly, 11.6% were unsure whether or not their institutions had a copyright/IPR policy, as shown in Figure 6. Only 21.6% of respondents (13 institutions) stated that they had a person in their organization responsible for copyright matters, which seemed relatively low compared to other survey participant countries such as the UK (64%), India (47.92%) and Spain (38.6%) but higher than France (18.6%) and Turkey (18%).

Persons responsible for copyright/IPR issues across the sectors

Further data analysis was undertaken to explore if the existence of copyright/IPR policy or a person responsible for copyright differed across the sectors as

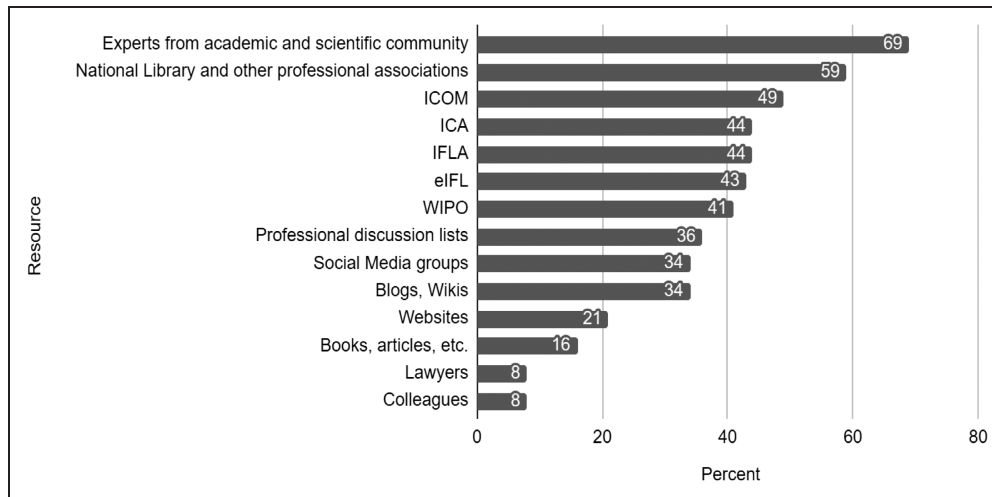


Figure 5. Copyright information resources consulted by respondents (n = 59).

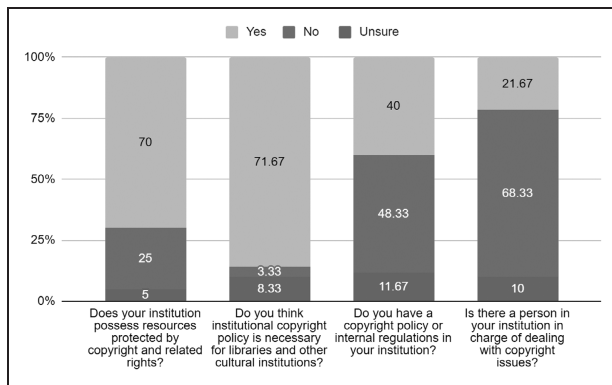


Figure 6. Copyright policy at an institutional level (n = 60).

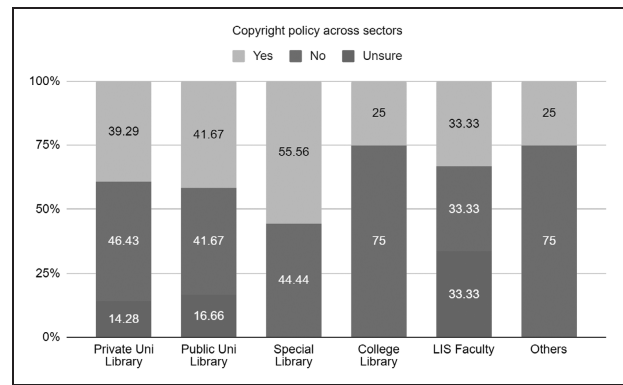


Figure 7. Copyright policy or internal IPR regulation by sector (n = 60).

depicted in Figures 7 and 8. From these two figures, it can be said that university libraries are more likely to have an institutional policy and a person responsible for copyright issues, although the percentage is very low compared to other countries where this survey was carried out during 2012–2017.

Overall, data from Figures 7 and 8 indicate that most, if not many higher educational institutions in Bangladesh, have no institutional level copyright policy in existence and no specific person is responsible for copyright/IPR issues. The scenario is slightly better in university and special libraries as these are far more likely to be involved in research and responsible for institutional-level knowledge creation and dissemination, where copyright/IPR are vital.

Copyright and education

In this section, the survey participants’ opinions were sought on the inclusion of copyright-related topics in LIS education, the appropriate level for introducing copyright topics in LIS programs and the appropriate mode for continuing education for copyright/IPR. In the open-ended questions, the survey asked which

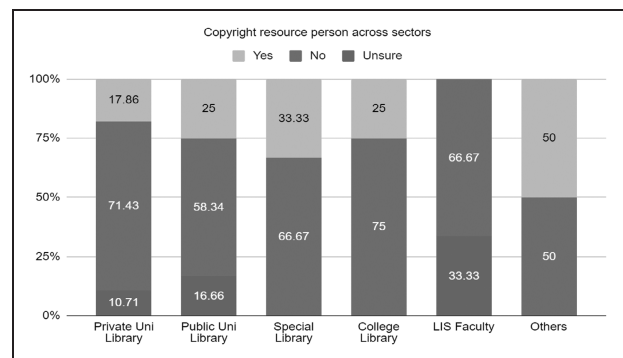


Figure 8. Persons responsible for copyright/IPR issues across the sectors (n = 60).

topics should be included in formal and continuous LIS education. A few respondents expressed the need to understand a wide variety of topics related to copyright/IPR. As one respondent indicated:

Copyright, license issue for e-resources, Institutional Repository policy issue, open access issues, and different criteria for e-publishing issues.

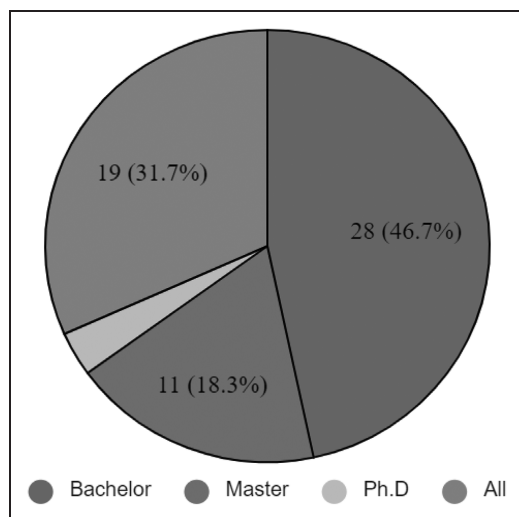


Figure 9. Opinion about appropriate education level for introducing copyright/IPR (n = 60).

Some others stated that copyright education should focus on ‘E-resources, Statistical reports, Periodical materials’, ‘ICT Related Issues’, ‘Copy right act for digital collection’ and ‘open access and copyright’.

Almost all of the respondents are in favor of including copyright issues in the LIS education curriculum as well as in continuing education. Regarding the question concerning the appropriate level of LIS education to introduce copyright, the majority of respondents considered undergraduate level (46.7%) the most appropriate, followed by ‘all (Bachelor’s, Master’s and PhD) LIS education levels’ (31.7%), Master’s (18.3%) and PhD curricula (3.3%) as illustrated in Figure 9.

Further on, the survey asked for respondents’ preferences for accessing continuous education in the LIS discipline. Training courses were the most popular (96%), with thematic workshops being the next popular (74.5%). Consultations on request, distance learning or e-learning and thematic electronic resources – websites, blogs, and wikis – were less popular for continuous education among LIS professionals in Bangladesh as detailed in Figure 10.

Discussion and comparisons with other surveyed countries

To the best of the author’s knowledge, this is the first study exploring the familiarity, knowledge, awareness and views about copyright of Bangladeshi LIS professionals. The results of this study suggest that librarians overall are at least somewhat familiar with a wide range of copyright/IPR issues and topics. There is good familiarity with some emerging topics such as licensing, digitization and institutional repositories, and moderate familiarity with open access, open data

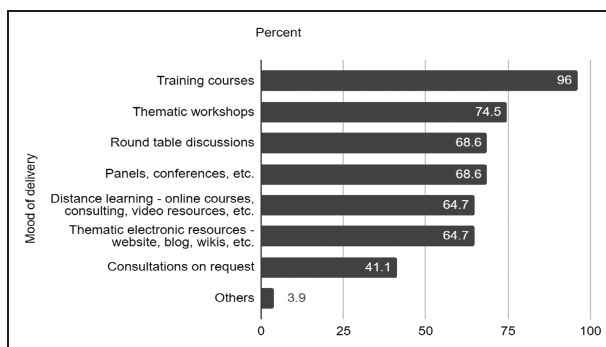


Figure 10. Preference for the delivery of continuous copyright/IPR education (n = 60).

and fair use. However, areas that are less familiar include copy-left, Creative Commons, out-of-print and orphan works.

The study also reveals that the levels of copyright/IPR literacy amongst this group are moderate compared to other surveyed countries such as the UK, USA, Turkey, France, Spain, Bulgaria, Croatia and India. Comparing the levels of confidence in copyright issues among the sectors suggests that university librarians are more confident than those working in other institutional libraries. There could be a number of reasons for this as university libraries are more likely to have an individual with specific responsibility for copyright matters, they are larger organizations than the others that participated in this survey, or at the very least have a department or unit that deals with copyright issues.

About 32% of Bangladeshi LIS professionals are moderately aware of copyright/IPR issues compared to 40% of UK (Morrison and Secker, 2015), 34% of French and 13% of Croatian (Todorova et al., 2014), and 23% of Indian (Naheem, 2017) respondents. Regarding the knowledge and awareness of national copyright policy, in general, this is somewhat lacking, particularly regarding the existence of the rights for librarians to provide modified copies of works to serve the needs of visually impaired patrons and the existence of orphan works, e.g. with a compulsory license or limitation of liability. Alongside LIS schools, the National Library of Bangladesh can also be a proactive stakeholder to improve knowledge and awareness of national copyright policy. With regard to institutional-level copyright/IPR policy, more than 86% percent of respondents thought institutions should have a copyright policy, yet only 40% actually have one. This compares to 63% of institutions in the UK (Morrison and Secker, 2015), 62.5% in India (Naheem, 2017), 34.7% in France (Boustany, 2014), 34% in Turkey and 33.5% in Spain (Arias-Coello and Simón-Martín, 2017) having a copyright policy.

Despite the importance of issues dealing with copyright/IPR, slightly more than one-fifth (21.67%) of institutions in Bangladesh have a person in charge of questions dealing with copyright/IPR compared to 38% in Spain (Arias-Coello and Simón-Martín, 2017), 47.9% in India (Naheem, 2017), 64% in the UK and only 15% of institutions surveyed in Croatia, Bulgaria, Turkey and France (Morrison and Secker, 2015). In Bangladesh, it is important to find out the actual reason for the low number of employees in charge of copyright matters despite its increasing importance. If it is because of the lack of knowledge and expertise, active collaboration with LIS schools and professional associations for training is suggested. However, if it is because institutions find it unnecessary, this could be an important indicator of the lack of awareness at the institutional level which needs to be addressed at the National Copyright Office, National Library, Ministry of Education, Ministry of Law, University Grant Commission and other related stakeholders.

Finally, there are also clear preferences for the delivery of formal copyright education and continuing education training. Regarding the appropriate amount and inclusion of copyright issues in the curricula of LIS education, most of the respondents agree that content should be included in more than one level of the three cycles (Bachelor's, Master's and PhD) in higher education (31.7%). The majority (46.7%) of Bangladeshi respondents thought it should be included in Bachelor (undergraduate) curricula, compared to 70.2% in France, 81.3% in Portugal, 90% in the UK and 92.3% in Spain (Arias-Coello and Simón-Martín, 2017) and only 19% in India (Naheem, 2017). For continuing education about copyright/IPR, the top preferred form by Bangladeshi LIS professionals was training courses (96%) compared to 92.1% of Indian, 85% of British, 88% of Spanish, 54.7% French and 69% of Bulgarian, Croatian and Turkish respondents (Todorova et al., 2014).

Conclusion and recommendations

This survey provides empirical evidence about copyright/IPR awareness of Bangladeshi LIS professionals. The results of this study suggest that librarians overall are at least somewhat familiar with a wide range of copyright issues and topics. The findings suggest that in Bangladesh there is a need for improvement. Measures should be taken to increase both awareness and the knowledge level of library and information science professionals regarding copyright/IPR issues at both national and international levels. Findings also indicate a recognized need for

copyright expertise within an organization, although it is not always the case that a dedicated post exists. Respondents expressed a desire to learn more about copyright/IPR as part of their professional qualifications and also to be kept up-to-date on issues relating to their job.

In Bangladesh, many smaller institutions may not have the resources to employ a dedicated copyright/IPR librarian. If this is the case, it is recommended that the institutions support at least one or (ideally) more individuals to develop their understanding of copyright so they can provide training and advice within the institution and highlight areas of concern. Whoever has responsibility for copyright does not necessarily need a legal qualification but should have familiarity with related issues, particularly digital resource subscription, fair use, open access, scholarly communication, research data sharing and institutional repository. In order to develop good practice, librarians must meet these issues head-on.

The fact is, most faculty members are so busy with research, grant writing, and teaching that few have time to even think about the continually changing landscape of copyright and IPR issues (Duncan et al., 2013). Viewing copyright/IPR as part of information literacy and scholarly communication is significant for LIS professionals and will continue to be in the future: thus copyright/IPR education must go beyond simply memorizing or explaining the rules. It is necessary to increase holistic knowledge and awareness of copyright/IPR issues in the sector placing copyright education into a wider context and highlighting that copyright/IPR issues are inherently linked to access to information and how people ethically use information (Secker et al., 2019). The results of the multinational studies including this study suggest that the current level of copyright knowledge among librarians is far from satisfactory. Therefore, additional efforts to embed copyright education are needed in both formal LIS education and continuous education. Research about copyright/IPR matters in Bangladesh requires more attention from LIS schools, particularly by LIS faculty and practitioners.

Development and actualization of training programs in different forms, including face-to-face and distance learning are needed. Training programs, conferences and workshops can be organized in collaboration with LIS schools and professional associations. Distance education, online blogging, video lessons and game-based learning could be good options since they are easier to attend and, therefore, generally the most preferred by those professionals who are working full time. Finally, the results of this study showed that librarians were not necessarily

aware of the many copyright organizations, especially international organizations, which could provide support and training. With better marketing and outreach, these copyright information organizations could eventually become trusted resources for librarians.

Considering the current situation locally and globally, it is a must to give urgent emphasis not only around protecting copyright and other intellectual property rights, but also about building awareness of those laws and policies. Government organizations, industrial associations, educational and research institutions, copyright and IP societies, media and NGOs can play a facilitating role in national capacity building and awareness raising for effective utilization of the copyright/IPR system in Bangladesh. To the face the challenges of the new millennium as other countries have done, Bangladesh needs to strengthen cooperation and exchange information, organize national dialogue and campaigns, enforce copyright and other intellectual property protection and make full use of the existing copyright/IPR system in the development of our national intellectual economy.

The author would like to reiterate that not only are we, as LIS professionals, bound to uphold the ethics of our profession of which copyright is an integral part, but also it is our responsibility to protect the copyright/IPR of others, many of whom allow us, as a library service, to lend their property to others. The survey was not without limitations in that it asked mainly closed questions. There were a number of questions where people chose not to answer or were uncertain, suggesting that copyright terminology could be off-putting or confusing. The size of the sample for this study was limited, but the results are nevertheless very significant. Also, given the low response rate in some sectors, caution should be adopted in making generalizations from the survey results. It is believed that the results may encourage the LIS schools and professional associations in Bangladesh and beyond to rethink copyright-related topics in their curriculum and training programs, for the betterment of the LIS profession and professionals.

Acknowledgments

The Survey Instrument was created and modified using the model from the research activities based on the research project 'Copyright Policies of Libraries and Other Cultural Institutions', financed by the National Scientific Fund of the Bulgarian Ministry of Education, Youth and Science, Contract № DFNI-K01/0002-21.11.2012 and headed by Tania Todorova from the State University of Library Studies and Information Technologies, Sofia, Bulgaria. Further developments can be followed on the project website:

<https://copyrightlib.unibit.bg/> and on a Multinational Copyright Literacy Survey Subpage: <https://copyrightliteracy.org/about-2/international-copyright-literacy/>, part of the UK Copyright Literacy website. The study 'A survey on Copyright Literacy of Library and Information Science Professionals in Bangladesh' is conducted with the permission of the original authors of the survey.

The author is grateful to Bebe Chang of Nova South-eastern University, Mohammad Tawhid of China Radio International, Muhammad Omar Faruk of the Islami Bank Bangladesh Ltd, Corinne Hertel of the International School Zug and Luzern, and Andrew Denney of ICS Zurich for their kind support in planning, translation, data collection and revision. Most importantly, the author is very thankful to the survey participants, without whom this study would not have been possible.

Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Zakir Hossain  <https://orcid.org/0000-0001-7095-9792>

Notes

1. This project was financed by the NSF of the Bulgarian Ministry of Education, Youth and Science, Contract № DFNI-K01/0002-21.11.2012 and headed by Tania Todorova from State University of Library Studies and Information Technologies, Sofia.
2. Normally colleges are affiliated with National University, Bangladesh enroll the clear majority of Bangladeshi tertiary students, although many colleges also offer upper-secondary (Grade 11–12) programs.
3. Copy-left, distinguished from copyright, is the practice of offering people the right to freely distribute copies and modified versions of a work with the stipulation that the same rights be preserved in derivative works created later (GNU Operating System, 2018).

References

- Ahmed A (2016) Enforcement of intellectual property rights (IPRS) in Bangladesh: An appraisal. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)* 21: 37–46.
- American Library Association (ALA) (2019) LibGuides: Copyright for Libraries: General Information. Available at: <https://libguides.ala.org/copyright> (accessed 17 June 2019).
- Association of Research Libraries (ARL) (n.d.) Copyright and Intellectual Property. Available at: <https://www.arl.org/category/our-priorities/advocacy-public-policy/copyright-and-ip/> (accessed 16 June 2019).

- Arias-Coello A and Simón-Martín J (2017) Copyright literacy in Spanish libraries, archives and museums. In: *European conference on information literacy, ECIL 2017* (eds S Kurbanoglu, et al.), St Malo, France, 18–21 September 2017, pp. 286–293. Cham: Springer.
- Boustany J (2014) Copyright literacy of librarians in France. In: *European conference on information literacy, ECIL 2014* (eds S Kurbanoglu, et al.), Dubrovnik, Croatia, 20–23 October 2014, pp. 91–100. Cham: Springer.
- Consortium of Academic and Research Libraries in Illinois (CARLI) (2014) Streaming video in academic libraries. White paper. Commercial Products Committee. Available at: <https://www.carli.illinois.edu/sites/files/files/2014CommercialProductsCommStreamingVideoinAcademicLibraries.pdf> (accessed 17 November 2019).
- Crews KD (2012) *Copyright Law for Librarians and Educators: Creative Strategies and Practical Solutions*. Chicago, IL: American Library Association.
- Crews KD (2015) *Study on Copyright Limitations and Exceptions for Libraries and Archives. Updated and Revised*. Geneva: WIPO.
- Cross W (2016) More than a house of cards: Developing a firm foundation for streaming media and consumer-licensed content in the library. *Journal of Copyright in Education and Librarianship* 1(1): 1–24.
- Department for Professional Employees, AFL-CIO (USA) (2019) Library professionals: Facts and figures. Available at: <https://dpeaflcio.org/programs-publications/issue-fact-sheets/library-workers-facts-figures/> (accessed 27 December 2019).
- Duncan J, Clement S and Rozum B (2013) Teaching our faculty: Developing copyright and scholarly communication outreach programs. Library Faculty and Staff Publications. Utah State University Digital Commons. Paper 117. Available at: https://digitalcommons.usu.edu/lib_pubs/117 (accessed 28 December 2019).
- GNU Operating System (2018) What is copyleft? GNU Project. Free Software Foundation. Available at: <https://www.gnu.org/licenses/copyleft.en.html> (accessed 27 December 2019).
- Hosen MF (2017) An overview of the copyright protection laws in Bangladesh: A critical analysis of the Copyright Act, 2000 with its loopholes and recommendations. *Beijing Law Review* 8: 191.
- Hossain Z (2017) Professional development via Facebook group: Perception of school librarians. In: *IASL annual conference proceedings*, Long Beach, CA, USA, pp. 143–157. Available at: <https://journals.library.ualberta.ca/slw/index.php/iasl/article/view/7160> (accessed 27 December 2019).
- Hossain Z (2019) Status of secondary school libraries and librarians in Bangladesh. *IFLA Journal* 45(2): 157–167.
- IFLA (2018a) Copyright issues for librarians. IFLA CLM Advisory Committee. Available at: <https://www.ifla.org/copyright-issues-for-libraries> (accessed 19 October 2019).
- IFLA (2018b) IFLA statement on copyright education and copyright literacy. Available at: <https://www.ifla.org/files/assets/clm/statements/ifla-statement-on-copyright-literacy.pdf> (accessed 17 November 2019).
- Khondker BH and Nowshin S (2013) *Developing National Intellectual Property Policy for Bangladesh: An Assessment of National Intellectual Property System (Draft)*. Dhaka: World Intellectual Property Organization (WIPO).
- King R (2014) House of cards: The academic library media center in the era of streaming video. *The Serials Librarian* 67(3): 289–306.
- McKenzie E (2013) A book by any other name: E-books and the first sale doctrine. *Chicago-Kent Journal of Intellectual Property* 12(1): 57.
- Morrison C and Secker J (2015) Copyright literacy in the UK: A survey of librarians and other cultural heritage sector professionals. *Library and Information Research* 39(121): 75–97.
- Naheem KT (2018) Copyright literacy of library and information science professionals in India: A survey. *International Journal of Information Dissemination and Technology* 7(4): 261–265.
- Naznin SA (2011) Protecting intellectual property rights in Bangladesh: An overview. *Bangladesh Research Publications Journals* 6: 12–21.
- Nilsson IL (2015) Copyright information and librarian's new role. In: *Towards open science*, London, UK, 24–26 June 2015. Available at: <http://urn.kb.se/resolve?urn=urn:nbn:se:kau:diva-37479> (accessed 27 January 2020).
- Olaka MW and Adkins D (2012) Exploring copyright knowledge in relation to experience and education level among academic librarians in Kenya. *International Information & Library Review* 44(1): 40–51.
- Oppenheim C and Woodward I (2004) A survey of copyright advice and guidance in UK higher education libraries. *Library and Information Research* 28(89): 50–56.
- Pessach G (2008) [Networked] Memory Institutions: Social remembering, privatization and its discontents. *Cardozo Arts & Entertainment Law Journal* 26: 71. Available at: <https://heinonline.org/HOL/LandingPage?handle=hein.journals/caelj26&div=6&id=&page=> (accessed 27 January 2020).
- Saha J (2017) Copyright Office finalises new draft of law. In: *Bdnews24.com*. Available at: <https://bdnews24.com/bangladesh/2017/08/26/copyright-office-finalises-new-draft-of-law> (accessed 17 November 2019).
- Schmidt L (2019) Library VHS in danger: Media preservation in academic libraries. *Journal of Copyright in Education and Librarianship* 3(1): 1–23.
- Secker J and Morrison C (2016) Copyright education and training. In: Secker J and Morrison CM (eds) *Copyright Education and Training*. London: Facet, pp. 211–238.
- Secker J, Morrison C and Nilsson IL (2019) Copyright literacy and the role of librarians as educators and

- advocates: An international symposium. *Journal of Copyright in Education and Librarianship* 3(2): 1–19.
- Todorova T, et al. (2014) A multinational study on copyright literacy competencies of LIS professionals. In: *European conference on information literacy, ECIL 2014* (eds S Kurbanoglu) Dubrovnik, Croatia, 20–23. October 2014, pp. 138–148. Cham: Springer.
- Todorova T, et al (2017) Information professionals and copyright literacy: A multinational study. *Library Management* 38(6/7): 323–344.
- Uddin K (comp.) (n.d.) Draft Report on Innovation and Intellectual Property Policy and Strategy for Bangladesh: A Project of WIPO. Available at: Government of Bangladesh [https://dpdt.portal.gov.bd/sites/default/files/files/dpdt.portal.gov.bd/notices/ae07f046_c5ad_](https://dpdt.portal.gov.bd/sites/default/files/files/dpdt.portal.gov.bd/notices/ae07f046_c5ad_497b_9ef8_d60ce413f76c/IP%20Policy.MKU.pdf)

497b_9ef8_d60ce413f76c/IP%20Policy.MKU.pdf (accessed 17 November 2019).

Author biography

Zakir Hossain is a teacher-librarian, and IASL Regional Director for International Schools. He is a Harvard CopyrightX graduate, Coursera mentor and an advocate of school libraries. As an early career researcher, Zakir's research interests lie in the field of school librarianship, pedagogic competency for librarians, copyright, academic integrity and PD on social media. He named for several professional awards and grants as a result of his commitment and dedication to the broader community.



Students' attitudes towards library overdue fines in an academic library: A study in a private university setting in Bangladesh

International Federation of
Library Associations and Institutions
2021, Vol. 47(1) 91–100
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0340035220944948
journals.sagepub.com/home/iff



Sangita Basak

Ayesha Abed Library, BRAC University, Bangladesh

Shamima Yesmin

Institute of Information Sciences, Noakhali Science and Technology University, Bangladesh

Abstract

In academic libraries, the obligation to pay a fine for overdue books is a common global phenomenon. As university libraries try to meet the growing expectations of their users with limited resources, it is important to ensure that the existing collection is available in circulation. This study investigated overdue returns at the BRAC University library, Bangladesh, focusing on the reasons why users returned their books late; students' satisfaction with the current overdue policies; and suggested improvements to the overdue procedures. The study was carried out using a quantitative methodology. Structured questionnaires were distributed to the students and data was collected over a period of 60 days between March and April 2019. Of the 300 questionnaires distributed, 258 were returned, with a response rate of 86%. The primary reasons for users' late return of books were forgetfulness and not completing the task required from the book. It is a positive fact of the study that, most students did not show unwillingness to use the library again after fine had been imposed for a late return; a large number of them managed to pay the fine out of their pocket money. The library's current policies were considered to be satisfactory. The students considered them to be a form of discipline, which made them return items at the appointed time. There was no gender bias in their reactions. Suggestions for improvement included increasing the collection of hard-copy and e-books. The outcomes of this research may help to develop the overdue and circulation policies of academic libraries in developing countries.

Keywords

Academic libraries, overdue books, overdue policy, students' behaviour, Bangladesh

Introduction

In general, a university library is considered a field of knowledge for study, teaching and research in any tertiary-level educational institution. To meet the demand for information and knowledge, each library must follow a policy to provide access to its available resources for its users. The circulation of libraries is one of the most important functions by which library users can borrow books and other resources for their required information as registered user (Hazarika and Gohain, 2013).

Although university libraries are increasingly providing electronic and digital content, in developing

countries, including Bangladesh, they continue to provide a combination of electronic and printed resources. As well as Bangladesh, other developing countries will find this article useful. Studies have shown that while students and researchers have a growing preference for electronic content, the majority still use both print and electronic resources (Zha et al., 2012). Although many users can access

Corresponding author:

Shamima Yesmin, Institute of Information Sciences, Noakhali Science and Technology University, Noakhali 3714, Bangladesh.
Email: rinty.shamima@gmail.com

Table 1. Demographic information of BRAC University and the Ayesha Abed Library.

University	Faculties	Departments	Students	Faculty members	Teacher–student ratio	Halls	Library staff	Library holdings
BRAC University (established 2001)	6	10	7403	674	1:11	6	17	266,384
Resources and circulation service		Items		Amount				
Collection		Books		46,544				
		Audiovisual materials		600				
		Institutional repositories		12,238				
		E-books		43,128				
		E-journals and databases		56,000+				
		Conference proceedings		18,318				
Circulation and overdue status		Circulation statistics (per week)		1050 (approximately)				
		Fines received for overdue items (per week)		6000 taka (approximately US\$71)				

Source: University Grants Commission of Bangladesh (2016) and interview with library staff.

Table 2. Additional information on library privileges and loan periods.

Member category	Number of items		Loan period		Overdue fines (taka per day)		
	Books	Audiovisual	Books (weeks)	Audiovisual (days)	Books	Audiovisual	Holds
Student	4	1	1	3	5	10	1

Source: Ayesha Abed Library (2019).

electronic resources at the same time, printed books are limited to one person at a time.

In order for items to be put back into circulation as quickly as possible, thereby increasing their availability for others, each library must formulate a user-oriented circulation policy that covers borrowing privileges, loan periods and penalties for returning library documents late. An overdue fine is an amount charged to users for keeping borrowed library books beyond the loan period. It is not a source of income; its aim is to encourage the timely return of books to the library.

About BRAC University's library

BRAC University is the top-ranked private university in Bangladesh, based on the Quacquarelli Symonds (2019) Asian university rankings in 2018. It was founded in 2001 under the 1991 Private Universities Act in the field of higher education. It provides high-quality education and aims to meet the demands of contemporary times.

The Ayesha Abed Library at BRAC University aims to become a world-class resource centre by providing innovative services and collections (for

example, printed books and journals, online journals and databases, theses, dissertations, internship reports and annual reports) to support the academic and research activities of the university community (see Table 1). The library was able to extend the range and depth of its collection by subscribing to thousands of e-journals and databases through two consortia – the University Grants Commission Digital Library and the Programme for the Enhancement of Research Information operated by the International Network for the Availability of Scientific Publications. The expenditure on printed books was US\$ 28,547 and on online journals US\$ 8247 (Kairy, 2017: 84).

As in most academic libraries, several measures for handling overdue materials have been taken at BRAC University's library. These measures include:

- Providing an online renewal facility;
- Allowing users to log into their account to check the due date of any items;
- Placing materials in the reserve book collection;
- Charging overdue fines of 5 taka per day for each book item and 10 taka per day for each audiovisual item (see Table 2);

- Sending friendly overdue notices to defaulters through mobile text messages as well as email accounts;
- Restricting further loans until the item is returned and the penalty for the non-returned item is received.
- What are the borrowers' perceptions with regard to whether overdue fines can prevent overdue items or not?
- What are the suggestions/opinions of students for minimizing overdue fines for overdue books?

Research problem

Recently, libraries have started to look at their fines policies more closely to determine the effects on patrons, workflow and staff, as well as to see whether their policies need to be changed or, in some cases, removed (Kim, 2018). Overdue fines may have a significant impact on students and researchers in their use of library resources, and user satisfaction. Therefore, it is necessary to conduct periodic studies to find out the attitudes of users regarding overdue books and fines, and the reasons they give for keeping items beyond their due date. To date, no studies have been carried out at BRAC University to gauge users' attitudes towards overdue fines. Therefore, this study was conducted at the Ayesha Abed Library at BRAC University. The findings and suggestions from this research will help libraries to understand user feedback, revise library rules and minimize overdue fines for late returns which have been practised for a long time.

Objectives

The main objective of this study was to determine the attitudes of students towards library fines, borrowing privileges and library policy. The study also aimed to identify the ways in which the library can encourage students to return books on time for the benefit of both the library and its users.

In order to achieve the aforementioned objective, and to ensure that other readers have access to the library books they need, the following research questions were raised for investigation:

- What are the usage patterns (purpose and frequency of visit) of the BRAC University library?
- What are the reasons for students keeping borrowed library books beyond their return date?
- Does the fine encourage/compel users to return library materials on time?
- Are students satisfied with the library's existing fines policy?

Literature review

Concerns about overdue library books are not new. In 1976, for example, Souter studied the incidence of delinquency among readers in British university libraries and noted, among other things, that getting students to return books on time was a problem. Mitchell and Smith (2005) pointed out that fines generally facilitate the timely return of books. They have argued, however, that there is little evidence that fines are more effective at minimizing outstanding books than reminder notices (Mitchell and Smith, 2005).

Currently, there has been very little research on overdue returns at academic libraries in either developed or developing countries. The majority of research has been conducted in countries where academic libraries are possibly more dependent on print materials than electronic resources. Common issues in the literature are discussed below.

Overdue books are recognized as an unavoidable part of library work and every library has a mechanism for retrieving overdue materials (Adomi, 2003: 19). One of the main concerns of libraries is to keep books in circulation and allow access to as many users as possible (Bhatt, 2011; Murugathas, 2009). McMenemy (2010: 79) emphasized the ethical aspect of book circulation by stating that penalizing borrowers with late payments can 'encourage users to be more community-minded'.

Sung and Tolppanen (2013) analysed data on library fines imposed in two medium-sized libraries in Hawaii to determine whether fines had an impact on the borrowers' return behaviour. The results indicated that fines, as well as the borrower group's status (undergraduates, graduates or faculty), had a significant impact on their return behaviour.

Several studies have explored the reasons for overdue books. Davies and Sen (2013) conducted a mixed-methods study on overdue books at Leeds University Library in the UK. The results showed that the main reasons for the late return of books were forgetfulness and the complexity of using the online renewals system.

Findings of numerous studies revealed that, the borrowers had to pay overdue fine because of their forgetfulness, encouraging them to keep it longer

because of the task being unfinished (Alao, 2002; Hazarika and Gohain, 2013).

In order to quantify library fines and their impact on patrons' return behaviour, Phelps (2015) carried out a study on library fines in the academic libraries at the University of Hawaii at Manoa and Eastern Illinois University in the USA. The results showed that graduate students who were not fined had much higher return rates before the deadline than undergraduates who incurred fines. Graduate students had higher return rates than teachers, although both groups had no fines.

Bhatt (2011) discussed students' perceptions of library fines at the Islamia College of Science and Technology Library in Jammu and Kashmir, India. The results of the study revealed that the majority of the patrons were satisfied with the borrowing privileges, loan periods and amount of the fines. Out of 290 respondents, 215 (77.33%) were aware of the fact that overdue fines were a disciplinary measure intended for library defaulters.

A study was conducted to assess the impact of the removal of fines at an academic library. The Vancouver Island Library in Canada eliminated most fines and made other loan modifications to improve access to its physical collections. One year later, the changes were evaluated using circulation data and interviews with staff. The removal of fines did not have a significant impact on borrowers' return rates and circulation numbers, but generated goodwill among library users (Reed et al., 2014).

Debating the policy of 'fines' or 'no fines', the articles in the published literature, libraries at such institutions as New York University, Texas A & M University and Swarthmore College, which eliminated daily fines and adopted a multi-level approach, introducing a penalty-point system to better manage their reserved books (Rupp et al., 2010).

In response to a request from the library administration team, the Harold B Lee Library's circulation committee at Brigham Young University designed and implemented a thorough evaluation of circulation policies. Using a variety of assessment methods, including surveys, focus groups and statistical analyses, the committee determined that the undergraduate loan period was insufficient and that the fine structure needed to change. Using the information obtained during the assessment, it successfully lobbied for an extension of the undergraduate loan period and the elimination of fines for materials that were regularly overdue (Wilson, 2014).

Some studies of overdue items have recommended improving library reminder notices to reduce the number of overdue returns (Alao, 2002; Anderson,

2008). It has also been suggested that text-message reminders might be more 'immediate and personal' as a way of alerting students to overdue items (Walsh, 2009: 10).

Shontz (1999) argued the effects of length between checkout and overdue fine in a medical library. The author discussed some other factors, such as the convenience of the renewal and returns system, the professional conscience have an positive impact on changing the users' late return.

Libraries can minimize overdue fines by sending late notices to defaulters, not allowing renewals and refusing further book loans (Hazarika and Gohain, 2013). Hazarika and Gohain (2013) also stated that this should be emphasized in library orientation sessions to make new members aware of the circulation policy.

Ajayi and Okunlola (2005) conducted a study on students' perceptions of increased fines for overdue books at the Hezekiah Oluwasanmi Library in Nigeria. Using a structured questionnaire, the survey covered 1500 respondents. The results suggested that, to avoid overdue returns a periodic review of the measure and the library automation, particularly circulation operations were essential.

Using a structured questionnaire, a survey was conducted at the Mysore University Library and University Undergraduate Library in India on users' attitudes towards overdue fines. The study made the recommendation to boost the library collections to avoid overdue fines (Sarasvathy et al., 2015).

Udumoh and Okoro (2007) studied the effect of library policies on overdue materials at university libraries in the South-South zone of Nigeria. This study revealed that library policy was one of the factors influencing the late return of books: 71.4% of the respondents agreed that policies imposing penalties on defaulters affected the late return of books. Only 60% of the respondents agreed that borrowed books were kept beyond the due date because the fine was minimal, and 57% of the respondents strongly agreed that library hours affected the timely return of books.

Kim (2018) conducted a study to examine the policy of overdue fines at the Undergraduate Library at the University of North Carolina, Chapel Hill. In particular, he analysed the impact of the fines policy on undergraduates and how they used the library, and how staff's experiences with fines affected their workflow. The results of the study showed that although many students believed that fines were an effective way of encouraging the return of books, the financial burden played a role in the negative impression of libraries and could deter some customers from using their services.

In order to better determine the impact of differential fines on user behaviour, Boehme and Mihaly (2018) experimented in their study by charging fines to one group and not to another. They found that there was no statistically significant change in the fines collected or the amount of library materials borrowed. The data suggested that patrons kept an item for as long as they needed it and returned it when they had finished with it.

From the review of the relevant literature, few studies have been carried out in developing countries in academic libraries regarding the overdue return of library holdings. In Bangladesh, until now, there has been a lack of studies which have examined the impact of overdue fines and circulation policies, as well as students' reactions to library penalties. This study aims to address this gap in the literature. In such a context, the significance of this study resides in examining the reactions of university students to the imposition of library fines at BRAC University, Bangladesh.

Methodology

Questions related to the issues identified during the literature review were developed and pretested on five students with experience of returning overdue items. These students were later excluded from the study. Based on the students' responses, the questions were revised to produce the final questionnaire (see Appendix 1). This questionnaire was used for the data collection.

However, the sample is not entirely random for two reasons. First, the sample was selected only from those who came to the library – those who did not come to the library (for whatever reason) had no chance of being selected. Second, the first-semester (fresher) students were excluded from the selection process as they were still undergoing the information literacy/library instruction programmes. So, purposive sampling was also used to a certain extent.

A total of 300 copies of the questionnaire were distributed. These were randomly distributed to those who came to use the library. It took about two months (March–April 2019) to distribute and get back the questionnaires. The rate of return was encouraging: 258 copies of the completed questionnaire were returned. The data was analysed using IBM SPSS.

A semi-structured interview was conducted with a library officer at the Ayesha Abed Library to establish the size of the collection, library usage statistics, and how many books were overdue per week, per month or over other time periods.

Table 3. Frequency of users' library visits (ranked frequency).

Frequency of visits	Gender		Frequency	Percent
	Male	Female		
At least once a week	38	45	83	32.17
Twice a week	37	27	64	24.81
Daily	32	30	62	24.03
Fortnightly	17	18	35	13.57
Whenever needed	4	10	14	5.43
Total	128	130	258	100.00

Table 4. Reasons for making use of the library (multiple answers applicable, ranked frequency).

Reasons for using the library	Male	Female	n	Percent
To borrow books/compact discs/DVDs	84	89	173	41.1
To read notes	47	37	84	20.0
To complete class assignments	22	35	57	13.5
For information	28	20	48	11.4
To relax	22	25	47	11.2
Other	5	7	12	2.9

Findings

The demographic profile of the respondents showed that, among the 258 students, 128 (49.61%) were male and the remaining 130 (50.39%) were female. Most of them (185, 72%) were studying at the undergraduate level, while only 73 (28%) were studying at the post-graduate level (see Table 3).

As shown in Table 4, around 41% of the students made use of the library to borrow library materials and only 11.4% used the library to get information. From Figure 1, most of the respondents had faced overdue fines in their past experience and, in this case, no gender deviation was observed.

As shown in Table 5, the three most common reasons for users returning their books late were: (1) forgetfulness (44.9%) – that is, not remembering to either renew or return the library materials on time; (2) necessity/perceived necessity (19.2%) – users needed the book or other materials for study so kept them beyond the due date; and (3) the inconvenience of the library regulations (15.8%) – users were unable to return the library materials on the due date due to the short loan period. Other reasons identified included being away from university on the due date; having lost or misplaced the book; having lent the book to a friend; and personal circumstances. These

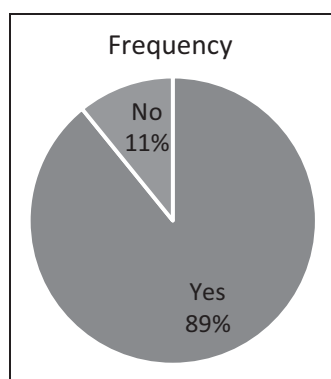


Figure 1. Past experience of users' overdue library materials.

Table 5. Users' explanations for having overdue library books in the past (multiple answers applicable, ranked frequency).

Reason for overdue books in the past	Male	Female	Frequency	Percent
I forgot the due date	69	50	119	44.9
I had not finished using the book/compact disc/DVD	21	30	51	19.2
Loan period was too short	21	21	42	15.8
Personal circumstances	7	6	13	4.9
Other	8	5	13	4.9
Could not get to the library	3	8	11	4.2
Lost the book/compact disc/DVD	3	7	10	3.8
Lent book to somebody else	3	3	6	2.3
Total	135	130	265	100.0

additional reasons for overdue returns were found to be far less common than the three main reasons. Thirteen students (4.9%) claimed illness, library server problems, sudden university leave, obstacles to obtaining library messages due to changing their mobile phone number or absence from the city on the due date as reasons for their past overdue experiences.

In response to the question 'How did you feel when you kept the library items/materials beyond the due date?', Table 6 shows that 74 students (31.2%) were not worried about the consequences of returning books late and 62 (26.2%) felt guilty about it happening or were afraid of the penalty for returning books late. It is a positive fact of the survey that, most of the students (87.8%) did not show an unwillingness to use the library again and only 10 (4.2%) students felt

Table 6. Users' reactions to keeping books beyond their due date.

Users' reactions	Male	Female	Frequency	Percent
Not worried	41	33	74	31.2
Afraid of the penalty	31	31	62	26.2
Felt guilty	28	34	62	26.2
Did not use the library again	11	18	29	12.2
Other	5	5	10	4.2
Total	115	122	237	100.0

Table 7. Students' sources of payment of fines.

Source of payment of fines	Male	Female	Frequency	Percent
Paid from pocket money (allowance)	80	83	163	68.2
Collected money from parents	21	32	53	22.2
Borrowed money from friends	8	4	12	5.0
Refused to pay	7	3	10	4.2
Other	1	0	1	0.4
Total	117	122	239	100.0

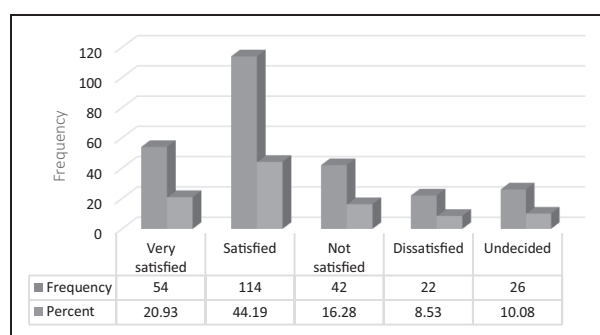
overdue fine as burdened. These findings contradict the findings of an earlier study by Ajayi and Okunlola (2005), in which 36.9% of students said they felt guilty for keeping books beyond the date due and 7.1% were not concerned about the consequences of late books.

As shown in Table 7, when students received a fine, a large number of them (68.2%) managed to pay it out of their pocket money. Only 4.2% of the students refused to pay the penalty. Among 57 students (24.4%) most of them never had a situation to pay the imposed fine. Only a few said that they had asked library staff if they could pay the fine later and only one student paid a fine from their part-time earnings (see Table 8).

When the students were unable to pay their fines, 36.3% dropped in an application to the librarian to request that the fine be cancelled. However, it is alarming to note that 14.1% of the students did not go to the library or borrow items again (see Table 8), which needs to be taken into consideration by library authorities. In response to the question 'Did you still continue to use/borrow library items after being fined?', 194 (75.19%) continued to use/borrow library items after being fined, which is encouraging.

Table 8. Students' approaches when unable to pay fines.

Students' approaches	Male	Female	Frequency	Percent
I drop in an application to the librarian requesting that my fine be cancelled	40	45	85	36.3
I do not go to the library	16	17	33	14.1
I do not borrow items again	17	16	33	14.1
I avoid the library staff	1	1	2	0.9
I use my friend's card to borrow items	13	11	24	10.3
Other	28	29	57	24.4
Total	124	110	234	100.0

**Figure 2.** Students' satisfaction level with existing fine rules.

Although 65.12% of the students were satisfied or very satisfied with the existing library fine rules (see Figure 2), this type of survey needs to be carried out at regular intervals to establish the consistency of their responses and identify any new opinions/suggestions that might arise.

In response to the question 'Do you think that an overdue library book is a problem when borrowing another library item?', 165 (63.95%) of the students felt that having an overdue item was not a barrier to borrowing another library item, and 95 (36.05%) saw it as an obstacle.

The respondents were asked what they thought about the fines for overdue items. Table 9 shows that 83 (29.3%) of the respondents thought that overdue fines made students return items at the appointed time; 79 (27.9%) were of the view that they would instil discipline; 34 (12.0%) said that they would make library books available and accessible; and 50 (17.7%) thought that they would discourage students from using library materials. The remaining 37 (13.1%) felt that they served as a hindrance to students borrowing books.

Question 14 in the survey (see Appendix 1) invited the users to provide open-ended responses with any other suggestions or comments about overdue library books that would help in minimizing the problem. This question was answered by only 45 users (17% of the total respondents). Budget allocation for more e-resources, multiple copies of hard-copy books and uninterrupted library server connectivity to receive messages from the library were the most common solutions offered by the students.

The findings of this study will help other academic libraries and librarians to comprehend the necessity of conducting user-feedback surveys, enriching library collections, revising library rules if needed, and taking the necessary steps in order to minimize overdue fines.

Conclusion and recommendations

From the analysis and findings of this study, it can be concluded that library users realized that, without charging fines, the library could not make students return their borrowed books promptly, and so it did not serve as a deterrent. This constituted a barrier to the free circulation and availability of library books. The library did not aim to collect fines or to generate income. The survey revealed that students at the BRAC University were in favour of fines. The study also revealed that the amount of the fines charged in an academic library was not a barrier to the effective utilization of the library collection. Most of the respondents were satisfied with the existing fines policy (only 19.38% disagreed with it; see Figure 2).

The students seemed to agree that fines did not discourage them from using the library; fines instilled discipline, which made students return items by the due date, thereby making the library items available and accessible. These policies therefore needed to be effectively enforced by library staff and defaulters must be made to pay their fines. The study also showed that there was no gender difference in the acceptance of the fine increases. What is important to students is that their information needs are met regularly and that they do not waste time wandering among the shelves.

With the increase in student enrolments at BRAC University, an increased library budget to meet the high cost of books, the availability of e-resources and uninterrupted library server connectivity to obtain library messages seem to be the solution. Special attention should be given to the identification of the most used titles and more copies should be purchased to minimize overdue fines.

Table 9. Students' opinions regarding the amount of fines for overdue books.

Perceptions of the increase in fines	Male	Female	Frequency	Percent
It will instil discipline	42	37	79	27.9
It makes students return items at the appointed time	41	42	83	29.3
It serves as a restriction to defaulters	18	19	37	13.1
It discourages students from using the library	22	28	50	17.7
It will make library items available and accessible	17	17	34	12.0
Total	140	143	283	100.0

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

ORCID iD

Shamima Yesmin  <https://orcid.org/0000-0002-9206-5885>

References

- Adomi E (2003) Attitudes of university library users towards overdue fines in Nigeria. *Bottom Line* 16(1): 19–24.
- Ajayi N and Okunlola A (2005) Students' perception of fine increases for overdue library books in an academic library. *Journal of Librarianship and Information Science* 37(4): 187–193.
- Alao I (2002) Students and overdue books in a medical library. *Journal of the Medical Library Association* 90(3): 294–297.
- Anderson C (2008) Are fines fine? A mixed methods study of the effectiveness of and attitudes to overdue fines among various borrower groups (age, gender, ethnicity, student status, faculty and degree) of the University of Canterbury Library. Master's Dissertation, Victoria University of Wellington, New Zealand.
- Ayesha Abed Library, BRAC University (2019) Library borrowing privileges. Available at: <http://library.bracu.ac.bd/library-borrowing-system> (accessed 12 September 2019).
- Bhatt H (2011) Students' perception of charging fines for overdue books: Case of Islamia College of Science and Technology Library. *DESIDOC Journal of Library and Information Technology* 31(6): 407–413.
- Boehme A and Mihaly K (2018) Fine efficacy: An experimental study of the effect of daily fines on borrower return habits. University Libraries Faculty Publications: 53. Available at: https://scholarworks.bgsu.edu/ul_pub/53
- Davies R and Sen B (2013) Overdue books at Leeds University Library. *Journal of Librarianship and Information Science* 46(3): 226–242.
- Hazarika M and Gohain M (2013) Attitudes of college library users towards overdue fines: A study of college libraries in Lakhimpur District of Assam, India. *International Journal of Digital Library Services* 3(3): 53–64.
- Kairy SN (ed.) (2017) Annual report 2017. BRAC University. Available at: <https://www.bracu.ac.bd/sites/default/files/resources/ar/BRACU-Annual%20Report-2017.compressed.pdf> (accessed 12 September 2019).
- Kim A (2018) Overdue fines in the academic library: Undergraduate student and staff perceptions of overdue fines at the UNC Undergraduate Library. Master's Dissertation, University of North Carolina at Chapel Hill, USA.
- McMenemy D (2010) On library fines: Ensuring civic responsibility or an easy income stream? *Library Review* 59(2): 78–81.
- Mitchell W and Smith F (2005) Using rewards to minimize overdue book rates. *Journal of Access Services* 3(1): 47–52.
- Murugathas K (2009) Why medical students keep books overdue: A study at the University of Jaffna. *Journal of the University Librarians Association of Sri Lanka* 13(1): 1–3.
- Phelps S (2015) Library fines make a difference in academic library book return behaviour. *Evidence Based Library and Information Practice* 10(3): 96–98.
- Quacquarelli Symonds (2019) QS World University Rankings: Asia 2018. Available at: <https://www.topuniversities.com/university-rankings/asian-university-rankings/2018> (accessed 12 September 2019).
- Reed K, Blackburn J and Sifton D (2014) Putting a sacred cow out to pasture: Assessing the removal of fines and reduction of barriers at a small academic library. *Journal of Academic Librarianship* 40(3–4): 275–280.
- Rupp E, Sweetman K and Perry D (2010) Updating circulation policy for the 21st century. *Journal of Access Services* 7(3): 159–175.
- Sarasvathy P, Giddiah D and Selvaraja A (2015) Attitude of library users towards overdue fines, University of Mysore: A study. *SRELS Journal of Information Management* 52(1): 51–57.
- Shontz D (1999) Effect of fines on length of checkout and overdues in a medical library. *Bulletin of the Medical Library Association* 87(1): 82–84.

- Souter G (1976) Delinquent readers: A study of the problem in university libraries. *Journal of Librarianship* 8(2): 96–110.
- Sung J and Tolppanen B (2013) Do library fines work? Analysis of the effectiveness of fines on patron's return behavior at two mid-sized academic libraries. *Journal of Academic Librarianship* 39(6): 506–511.
- Udoumoh C and Okoro C (2007) The effect of library policies on overdue materials in university libraries in the South-South zone, Nigeria. *Library Philosophy and Practice*: 142. Available at: <https://digitalcommons.unl.edu/libphilprac/142>
- University Grants Commission of Bangladesh (2016) 43rd annual report of the University Grants Commission of Bangladesh. Available at: <http://www.ugc.gov.bd/site/page/4fd862b5-7b93-44c8-a761-b8cac565fa43/%E0%A6%AC%E0%A6%BE%E0%A6%B0%E0%A7%8D%E0%A6%B7%E0%A6%BF%E0%A6%95-%E0%A6%AA%E0%A7%8D%E0%A6%B0%E0%A6%A4%E0%A6%BF%E0%A6%AC%E0%A7%87%E0%A6%A6%E0%A6%A8-%E0%A7%A8%E0%A7%A6%E0%A7%A7%E0%A7%AC> (accessed 12 September 2019).
- Walsh A (2009) Text messaging (SMS) and libraries. *Library Hi Tech News* 26(8): 9–11.
- Wilson D (2014) Why can't they keep the book longer and do we really need to charge fines? Assessing circulation policies at the Harold B Lee Library: A case study. *Journal of Access Services* 11(3): 135–149.
- Zha X, Li J and Yan Y (2012) Understanding usage transfer from print resources to electronic resources: A survey of users of Chinese university libraries. *Serials Review* 38(2): 93–98.

Author biographies

Sangita Basak obtained her BA (Hons) and MA in Information Science and Library Management from the University of Dhaka, Bangladesh. She is currently working as Assistant Librarian at Brac University, Dhaka, Bangladesh. She also served as Library Officer at Asian University for Women (AUW), an independent, international university in Chittagong, Bangladesh. Her research interests include the use of various library services, mapping of e-resources, database management, information literacy, digital libraries and other related areas.

Shamima Yesmin is currently working as Assistant Professor of Institute of Information Sciences, Noakhali Science and Technology University, Bangladesh. She served as Library Officer at the East West University, a premier private university in Bangladesh. Her research interests include the use of various cataloging tools in higher education and learning, human use of electronic products and services, library service quality assurance and bibliometrics.

Appendix I

Questionnaire: Patrons' behaviour towards library staff for overdue fines

Please tick the appropriate box or complete the answer

A. Personal data

Age: ____ years

Gender: Male Female

Study level: Undergraduate Postgraduate

B. Library use and borrowing behaviour

1. How frequently do you visit the library in a month?

- Daily Twice a week Weekly
 Twice a month Whenever needed Other (please specify)

2. Why do you make use of the library?

- To borrow books To read notes For information
 To complete class assignments Other (please specify)

3. How regularly do you borrow books in a month from the library?

- Weekly Twice a month Monthly
 Occasionally Not at all

4. Have you faced the overdue library books in the past?

- Yes No

5. If you have had overdue library books in the past, what was the explanation? Tick any that apply (ranked frequency)
- I forgot the due date I did not finish using the books
 Loan period too short Personal circumstances
 Lost the book Lent the book to somebody else
 Could not get to the library Other (please specify)
6. How did you feel when you kept the library items/materials beyond the due date?
- Afraid of the penalty Not worried I did not use the library again
 I felt guilty Other (please specify)
7. How did you pay the fines?
- Paid from my pocket money Borrowed money from friends
 Collected money from parents Refused to pay Other (please specify)
8. If you cannot pay the fines, what do you do?
- I drop in an application to the librarian requesting the cancellation of my fine
 I do not go to the library I do not borrow books again
 I avoid the library staff I use my friend's card to borrow books
 Other (please specify)

C. Students' perceptions regarding overdue fines

9. What do you think about the amount of the fines for overdue books?
- It will instil discipline It makes students return books on time
 It serves as a restriction to defaulters
 It discourages students from using the library
 It will make library books available and accessible
10. Are you satisfied/dissatisfied with the existing fine rules?
- Very satisfied Satisfied Not satisfied
 Dissatisfied Undecided
11. Did you continue to use/borrow library books after being fined?
- Yes No
12. Do you think that an overdue library book is a problem when borrowing another library item?
- Yes No
13. Do you agree that the burden of fines reduces the problem of overdue books?
- Strongly agree Agree Neutral
 Disagree Strongly disagree
14. What suggestions can you give that will help in minimizing the problem of overdue books?
.....

Abstracts

مستخلصات

Sources of climate change information used by newspaper journalists in Tanzania

مصادر المعلومات عن تغير المناخ التي يستخدمها الصحفيون في تنزانيا

بيتر أونوفو وألفرد سعيد سيف

مجلة الإفلا، 47-1

المستخلص: يقيم هذا البحث مصادر المعلومات التي يستخدمها الصحفيون في تنزانيا في جمع المعلومات عن تغير المناخ. تتمثل أهم المصادر التي يرجعون إليها في خبراء تغير المناخ والفعاليات اليومية؛ مثل اللقاءات المجتمعية والتجمعات الاجتماعية الأخرى ذات الصلة. فمن المعتقد أن تلك المصادر تفاعلية؛ مما يتيح للصحفيين الحصول على المعلومات عن تغير المناخ، ويسهل الوصول إليها، وتقدم ردوداً فورية. وتبين أيضاً أن قلة استخدام مصادر المعلومات المحتملة الأخرى؛ مثل المكتبات، والمواد المطبوعة، والمواقع الإلكترونية، مصحوبة بالتحديات المهمة التي تعيق سعي الصحفيين وراء المعلومات الخاصة بتغير المناخ، وتغطيتها، والإبلاغ عنها، قد تؤثر في جودة المنشور من تلك المعلومات في الصحف التنزانية وكما. فينبغي أن يتعاون جميع أصحاب الأسهم المنخرطون في المعركة ضد تغير المناخ وكليات الصحافة على وضع استراتيجيات تهدف إلى بناء قدرات الصحفيين والمحررين والمراسلين في أداء مهامهم اليومية.

Information seeking behaviour of science and technology researchers in Nigeria

سلوك باحثي العلوم والتكنولوجيا فيما يخص البحث عن المعلومات في نيجيريا

أولايكا بابامي ماكندي، وجنرور فيلايل جيان، وتيناشي مجويس

مجلة الإفلا، 47-1

المستخلص: يلعب قطاع العلوم والتكنولوجيا دوراً مهماً في نمو وتنويع الاقتصاد النيجيري. تبحث هذه الورقة في سلوك البحث عن المعلومات للباحثين في مجال العلوم والتكنولوجيا (STRs) في نيجيريا من أجل اتباع النهج الصحيح فيما يتعلق بتوفير المعلومات. يستند هذا البحث إلى منهجية الدراسات الاستقصائية، التي أجريت على 114 باحثاً متعدد التخصصات في مجال العلوم والتكنولوجيا من

المعهد الفيدرالي للبحوث الصناعية أو شودي. وكشفت نتائج الدراسة أن هؤلاء الباحثين كثيراً ما بحثوا عن المعلومات في المجلات ومن ذوي المعرفة، كان مصدر الإنترنت هو مصدر المعلومات الأكثر شيوعاً. كما استخدموا المعلومات في إجراء البحوث وتلبية الاحتياجات الشخصية ضمن غيرها. ومن التحديات التي يواجهونها عند استخدام مصادر المعلومات وجود كتب عفا عليها الزمن وعدم اعتماد الخدمات الإلكترونية. وتوصي الدراسة بتوجيه الجهود نحو تحسين إتاحة المعلومات للباحثين والحث على اعتماد قواعد البيانات المؤسسية الإلكترونية.

Business Intelligence in Academic Libraries in Jordan: Opportunities and Challenges

ذكاء الأعمال في المكتبات الأكاديمية في الأردن: فرص وتحديات

فاتن حماد، ورزان العمرو، وسيناريا عبد الجبار، وحسام فاخوري

مجلة الإفلا، 47-1

المستخلص: تلعب البيانات دوراً كبيراً في المساعدة على فهم الاحتياجات المتغيرة لمستخدمي المكتبات الأكاديمية فهماً واضحاً والابتكار في الخدمات المقدمة إليهم والإجراءات المتخذة تبعاً. فالبيانات بحاجة لتحويلها إلى معلومات من أجل صنع القرار والتخطيط الاستراتيجي. ويقدم ذكاء الأعمال أدوات تحليلية قوية؛ مثل أدوات التصوير المرئي للبيانات والتنقيب عنها، تساعد في اتخاذ قرارات مدروسة؛ وبالتالي تغير تجربة المستخدم بالكامل، وترتقي بها. وتبحث هذه الدراسة في مفهوم ذكاء الأعمال من خلال تصورات العاملين في إدارات المعلومات في المكتبات الأكاديمية في الأردن. كما يناقش الفرص والتحديات المصاحبة له، ويستكشفها. وأفضت الدراسة إلى اتفاق العاملين في إدارات المعلومات على أن ذكاء الأعمال يحسن من عملية صنع القرار، ويساعد صناعات القرار على اتخاذ أدق القرارات وأنسبها للمكتبة في الوقت المناسب. كما تشير نتائج الدراسة إلى أهمية وجود بنية تحتية مناسبة لنجاح تطبيق ذكاء الأعمال في المكتبات الأكاديمية في الأردن.

Research Data Management in Turkey

إدارة البيانات البحثية في تركيا

جوليدا دوجان، وزهرة تسكين، وأرسيف أومور أيدنأوغلو

مجلة الإفلا، 47-1

المستخلص: إن إدارة البيانات البحثية موضوع مهم فيما يتعلق بوكالات التمويل والجامعات والباحثين. وفي هذا الصدد، تهدف الدراسة بالأساس إلى جمع المعلومات الأولية من أجل أن يحقق مستودع أيرتا، وهو تحت إنشاء مجلس البحوث العلمية والتكنولوجية في تركيا، الأهداف التالية: تحديد مستوى وعي الباحثين في تركيا بإدارة البيانات البحثية، وفهم الممارسات المتبعة حاليًا لإدارة البيانات البحثية في بيئاتها البحثية، ومعرفة خبراتهم حول قضايا السياسات. لذلك، وُزِع استبيان على 37223 باحثًا، وأكمله 1577 منهم. وأشارت النتائج إلى أن الباحثين الذين يقضون وقتًا أطول مع البيانات لديهم مخاوف أكثر بخصوص مسائل إدارة البيانات. كما اتضح أن مستوى الخبرة فيما يتعلق بوضع خطط إدارة البيانات منخفض تمامًا. وتكمن أهمية هذه الدراسة في كيفية عرض الممارسات الحالية التي يقوم بها العلماء الأتراك لإدارة البيانات البحثية في ظل مرحلة التطوير الأساسية للمستودع الجديد.

Analysis of alliance of archives, libraries and museums of South Africa National Parks: Kruger National Park

تحليل تحالف الأرشيف والمكتبات والمتاحف في المنتزهات العامة في جنوب أفريقيا: منتزه كروجر العام

نخولديني سيدني

مجلة الإفلا، 47-1

المستخلص: يهدف هذا البحث إلى تحليل تحالف الأرشيف والمكتبات والمتاحف في منتزه كروجر العام فيما يتعلق بامتثالها للقوانين، ودوره في التعليم وتبني تكنولوجيا المعلومات والاتصالات. وتابع البحث المنهجية الكيفية في جمع البيانات، وتوصل إلى أن معظم المشاركين ليسوا على دراية بالقوانين التي تحكم تحالف الأرشيف والمكتبات والمتاحف في المنتزهات العامة في جنوب أفريقيا. فلم يُستفاد من هذا التحالف استفادة كاملة في الأنشطة التعليمية من أجل تعزيز إدارة المعرفة؛ حيث إن معدل استخدام تكنولوجيا المعلومات والاتصالات في التعليم منخفض. ونأمل أن تساعد هذه الدراسة في إعداد برامج بحث تتصدى للتحديات المجتمعية؛ مثل تبني سياسات سيكون لها تأثير إيجابي على تنفيذ سياسات تحالف الأرشيف والمكتبات والمتاحف.

Copyright literacy of library and information science professionals in Bangladesh

إمام المتخصصين في علوم المكتبات والمعلومات في بنجلادش بحقوق الطبع والنشر

زاكير حسين

مجلة الإفلا، 47-1

المستخلص: كثيرًا ما يلعب المتخصصون في علوم المكتبات والمعلومات دور المخضرمين ضمناً في حقوق الطبع والنشر في مؤسساتهم؛ وبالتالي، يجب أن يكونوا ملمين بقوانين حقوق الطبع

والنشر وممارساتها. وقد أجرت بنجلادش دراسة استقصائية كمية قومية بعنوان ' إمام المتخصصين في علوم المكتبات والمعلومات في بنجلادش بحقوق الطبع والنشر'، كجزء من دراسة استقصائية متعددة الجنسيات بعنوان ' إمام المتخصصين في المكتبات والمؤسسات الثقافية الأخرى بحقوق الطبع والنشر'، بهدف توضيح تصور المتخصصين في علوم المكتبات والمعلومات في بنجلادش الذاتي عن إمامهم ومعرفتهم ووعيهم بقضايا حقوق الطبع والنشر وأرائهم فيها. كما استطلعت الدراسة الاستقصائية سياسات حقوق الطبع والنشر في المؤسسات، وحاجة المتخصصين الجدد والقائمين لتعلمها، والموضوعات المقترحة ضمها إلى الأنشطة التدريبية. وتوضح نتائج الدراسة أن المتخصصين في علوم المكتبات والمعلومات في بنجلادش لديهم معرفة ووعي مفاهيمي بقضايا حقوق الطبع والنشر، لكنهم يفتقرون بشكل عام إلى المنهج التطبيقي والتدريب العملي. وتتجلى نقطة الضعف هذه أكثر عند المتخصصين في علوم المكتبات والمعلومات العاملين في المؤسسات غير الأكاديمية. وبناء على هذه النتائج، من المقترح تنظيم ورش عمل وحلقات دراسية واجتماعات موائد مستديرة تركز على حقوق الطبع والنشر، والتي من شأنها تمهيد الطريق لتطوير المعرفة بهذا الموضوع.

Students' attitude towards library overdue fines in academic library

موقف الطلاب تجاه غرامات التأخير التي تفرضها المكتبات الأكاديمية

سانيتا باساك، وشميمة ياسمين

مجلة الإفلا، 47-1

المستخلص: إن فرض الغرامات على الكتب المتأخرة في المكتبات الأكاديمية ظاهرة عالمية. وفي ظل محاولة المكتبات الجامعية تلبية التوقعات المتزايدة لدى المستخدمين فيما يخص الموارد المحدودة، من المهم ضمان إتاحة المجموعة الموجودة للجمهور. وقد بحثت هذه الدراسة في عائدات غرامات التأخير في مكتبة جامعة لجنة بنجلادش للنهوض بالريف (براك)، بالتركيز على أسباب تسليم المستخدمين الكتب متأخرًا، ومدى رضا الطلاب عن سياسات تأخر التسليم الحالية، والتحسينات المقترحة لإجراءات المتبعة عند التأخير. واعتمدت الدراسة المنهجية الكمية. ووزعت استبيانات منظمة على الطلاب، وجمعت البيانات على مدار 60 يومًا في الفترة بين مارس وإبريل 2019. استُكملت 258 استبيانًا من أصل 300 استبيان بنسبة استجابة 86%. وكان السبب الرئيس لتأخر تسليم الطلاب للكتب هو النسيان وعدم الانتهاء من المهام المطلوبة من الكتب. ومن الحقائق الإيجابية التي أظهرتها هذه الدراسة أن معظم الطلاب لم يبدوا عدم الاستعداد لعدم استخدام المكتبة مرة أخرى بعد توقيع غرامات التأخير عليهم، بل تمكن عدد كبير منهم من تسديدها من مصروفهم الخاص. وتعد سياسات المكتبة الحالية مرضية. فإرهاها الطلاب كشكل من أشكال الانضباط، مما جعلهم يرجعون الكتب في الوقت المحدد. ولم يبدو عليهم أي تحيز على أساس نوع الجنس. ومن التحسينات المقترحة تزويد مجموعة الكتب المطبوعة والإلكترونية. وقد تساعد نتائج هذا البحث في تطوير سياسات التأخير والتوزيع في المكتبات الأكاديمية في الدول النامية.

摘要

Sources of climate change information used by newspaper journalists in Tanzania

坦桑尼亚报纸中的气候变化信息来源

Peter Onauphoo, Alfred Said Sife

IFLA Journal, 47-1, 5-19

摘要：本文研究了坦桑尼亚报纸收集气候变化信息的来源。坦桑尼亚报纸的记者参考的气候变化信息的主要来源是气候变化专家、该领域的相关会议和其他集会等日常活动。这些资料来源具有互动性，使记者能够获得气候变化信息，同时具有获取便利性，并且提供即时反馈。本文还发现，图书馆、印刷材料和网站等其他潜在信息来源的利用不充分，加上阻碍报纸记者检索和报道气候变化信息的重大挑战，可能会影响到坦桑尼亚报纸发布的气候变化信息的质量和数量。参与应对气候变化的所有利益相关方和新闻学院应开展合作并制定战略，提升报纸记者、编辑和其他通讯人员在日常工作中的能力。

Information seeking behaviour of science and technology researchers in Nigeria

尼日利亚科研人员的信息检索行为

Olayinka Babayemi Makinde, Glenrose Velile Jiyane, Tinashe Mugwisi

IFLA Journal, 47-1, 20-36

摘要：科学技术在尼日利亚的经济增长和多样化发展方面发挥着重要作用。本文探讨了尼日利亚科研人员的信息检索行为，旨在探索信息提供的正确方法。本文采用调查方法，以奥绍迪联邦工业研究所的114名多学科科研人员为调查对象。研究结果显示，科研人员的信息来源以期刊和专业人士为主；网络是使用最频繁的信息来源。科研人员利用信息的最主要目的包括开展研究和满足个人需求。利用信息方面的挑战包括图书过时和电子服务使用不充分。本文建议，应努力改善科研人员获取信息的渠道，并建设机构电子数据库。

Business Intelligence in Academic Libraries in Jordan: Opportunities and Challenges

约旦高校图书馆的商业智能：机遇和挑战

Faten Hamad, Razan Al Amr, Sinaria Abdel Jabbar, Hussam Fakhuri

IFLA Journal, 47-1, 37-50

摘要：数据在帮助人们清楚地了解高校图书馆用户不断变化的需求，并相应地创新其服务和流程方面发挥着重要作用。数据需要转化为决策和战略规划所需的信息。商业智能提供了强大的分析工具，如可视化和数据挖掘工具，可以帮助作出明智的决策，从而将用户体验提升到更高水平。本文从约旦各高校图书馆信息情报部门员工的认知出发，探讨了商业智能的概念，同时探究了与之相关的机遇和挑战。研究结果显示，信息情报部门员工认为商业智能有助于提高决策水平，帮助决策者为图书馆作出最准确、最及时的决策；另外，完善的基础设施对于约旦各高校图书馆成功应用商业智能具有重要意义。

Research Data Management in Turkey

土耳其的研究数据管理

Guleda Dogan, Zehra Taskin, Arsev Umur Aydinoglu

IFLA Journal, 47-1, 51-64

摘要：“研究数据管理”是资助机构、大学和研究人员的重要课题。在这一背景下，本文的主要目的是为土耳其科学技术研究委员会正在开发的Aperta系统收集初步信息，从而实现以下目标：明确土耳其科研人员的研究数据管理意识水平；了解当前的研究数据管理实践；总结他们在政策问题方面的经验。为此，本文作者向37223名科研人员发放了调查问卷，其中1577人完成了问卷。调查结果表明，花更多时间研究数据的科研人员更关心数据管理问题。目前，制定数据管理计划的经验水平非常低。本研究的重要意义在于揭示了土耳其学者在新数据库基础开发阶段的研究数据管理实践情况。

Analysis of alliance of archives, libraries and museums of South Africa National Parks: Kruger National Park

南非国家公园档案馆、图书馆与博物馆联盟分析：以克鲁格国家公园为例

Nkholezeni Sidney Netshakhuma

IFLA Journal, 47-1, 65-77

摘要：本文分析了克鲁格国家公园档案馆、图书馆与博物馆机构联盟在遵守法律、各机构在教育领域的职责以及信息和通信技术应用方面的情况。本文采用定性方法收集数据。研究发现，大多数参与者不了解南非有关档案馆、图书馆与博物馆的立法。联盟在加强知识管理的教育活动中没有发挥充分的作用；利用信息和通信技术开展教育的机构占比也很低。本文旨在制定研究议程，以应对社会挑战，例如制定有利于实施档案馆、图书馆与博物馆政策的规定。

Copyright literacy of library and information science professionals in Bangladesh

孟加拉国图书情报学专业人员的版权素养

Zakir Hossain

IFLA Journal, 47-1, 78-90

摘要：图书情报学专业人员在其机构中往往被默认为版权专家，因此必须具有版权法律和实践的素养。本文作者在全国范围开展了大规模调查，主题为“孟加拉国图书情报学专业人员的版权素养”，它属于国际调查“图书馆和其他文化机构专家的版权素养”的一项内容，主要目的在于展现孟加拉国图书情报学专业人员对版权相关问题的了解、知识水平和思考。本文还探讨了现有的机构版权政策以及对专业人员提供版权教育的必要性，并针对培训活动的主题提供了建议。结果表

明，孟加拉国图书情报学专业人员对版权问题有概念性的认识，但总体上缺乏实用的方法和实践培训。在非高校图书馆工作的图书情报学专业人员中，这种缺陷更加突出。根据这些调查结果，本文建议举办以版权为重点的讲习班、研讨会和圆桌会议，为围绕这一主题的知识开发奠定基础。

Students' attitude towards library overdue fines in academic library

学生对于高校图书馆逾期罚款的态度

Sangita Basak, Shamima Yesmin

IFLA Journal, 47-1, 91-100

摘要：在高校图书馆中，支付逾期罚款是一种全球普遍的现象。大学图书馆需要利用有限的资源满足用户日益增长的需求，因此有必要确保现有馆藏的流通。本文调查了孟加拉国BRAC大学图书馆的逾期还书情况，重点研究了用户逾期还书的原因、学生对现行逾期政策的满意度以及对逾期还书流程的改进建议。本文采用了定量方法，向学生发放结构化问卷，在2019年3月至4月的60天内收集数据。我们发出了300份问卷，其中258份得到了回复，回复率为86%。用户逾期还书的主要原因包括忘记归还和没有读完。这项研究体现了一个积极的事实：大多数学生因逾期遭到罚款后，并没有表现出不愿意再次使用图书馆的态度；其中很多人用零花钱支付了罚款。图书馆的现行政策令人满意。学生们将图书馆政策视为一种纪律，确保他们在限定的时间内归还图书。学生的回复没有体现出性别偏差。改进建议包括增加纸质书和电子书的馆藏量。本文的研究成果为发展中国家高校图书馆制定逾期和流通政策提供了参考。

Sommaires

Sources of climate change information used by newspaper journalists in Tanzania

Sources d'information sur le changement climatique utilisées par les journalistes de la presse écrite en Tanzanie

Peter Onauphoo, Alfred Said Sife

IFLA Journal, 47-1, 5-19

Résumé : Cet article s'intéresse aux sources d'information utilisées par les journalistes de la presse écrite en Tanzanie pour rassembler des informations à propos du changement climatique. Experts du changement climatique et événements du quotidien, par exemple réunions communautaires et autres rassemblements sociaux de cet ordre, constituent les principales sources d'information consultées par ces journalistes. Ces sources sont estimées avoir un caractère interactif, permettant ainsi aux journalistes de se procurer des informations à propos du changement climatique; elles sont facilement accessibles, utilisant et fournissant des réponses immédiates. L'article constate également qu'un mauvais usage d'autres sources potentielles d'informations, par exemple bibliothèques, documents imprimés et sites web, assorti de défis majeurs qui empêchent les journalistes de la presse écrite de rechercher, couvrir et rendre compte des informations relatives au changement climatique, peut nuire à la qualité et à la quantité des informations publiées dans les journaux tanzaniens à ce sujet. Toutes les parties prenantes impliquées dans la lutte contre le changement climatique ainsi que les instituts de formation au journalisme devraient collaborer et concevoir des stratégies dans le but de renforcer les capacités des journalistes de la presse écrite, des rédacteurs et des reporters dans leurs activités quotidiennes.

Information seeking behaviour of science and technology researchers in Nigeria

Comportement de recherche d'informations des chercheurs en sciences et technologies au Nigeria

Olayinka Babayemi Makinde, Glenrose Velile Jiyane, Tinashe Mugwisi

IFLA Journal, 47-1, 20-36

Résumé : Le secteur des sciences et des technologies joue un rôle important dans l'expansion et la diversification de l'économie nigériane. Cet article examine le comportement de recherche d'informations des chercheurs en sciences et technologies au Nigeria afin

d'adopter une approche adaptée pour la transmission d'informations. Une méthode de sondage a été utilisée pour cette étude et 114 chercheurs multidisciplinaires de l'Institut fédéral de la Recherche industrielle Oshodi ont été sondés. Les conclusions de l'étude ont montré que les chercheurs en sciences et technologies se procurent fréquemment des informations dans des revues et auprès de personnes compétentes; Internet était la source d'informations la moins souvent consultée. Ces chercheurs utilisaient notamment les informations pour mener des recherches et répondre à une demande personnelle. Des livres obsolètes et le fait de ne pas adopter les services électroniques sont parmi les défis identifiés en rapport avec l'utilisation des sources d'informations. L'étude recommande des efforts en vue d'améliorer l'accès des chercheurs aux informations, et il faut encourager la mise en place de bases de données électroniques institutionnelles.

Business Intelligence in Academic Libraries in Jordan: Opportunities and Challenges

L'informatique décisionnelle dans les bibliothèques universitaires en Jordanie : opportunités et défis

Faten Hamad, Razan Al Amr, Sinaria Abdel Jabbar, Hussam Fakhuri

IFLA Journal, 47-1, 37-50

Résumé : Les données jouent un rôle majeur pour bien comprendre l'évolution des besoins des utilisateurs des bibliothèques universitaires, afin de pouvoir innover en conséquence au niveau des services et des procédures. Les données doivent être transformées en informations utilisées pour prendre des décisions et pour un planning stratégique. L'informatique décisionnelle offre des outils puissants, aussi bien outils analytiques, par exemple la visualisation, qu'outils d'exploitation des données. Ces outils permettent de prendre des décisions en toute connaissance de cause et par conséquent de faire passer l'expérience utilisateur au niveau supérieur. Cet article s'intéresse au concept d'informatique décisionnelle considéré du point de vue du personnel des services d'informations des bibliothèques universitaires en Jordanie. Les opportunités et défis en rapport sont également abordés et examinés. Comme l'indiquent les résultats, le personnel des services d'informations reconnaît que l'informatique décisionnelle améliore la prise de décision, en aidant les décideurs à prendre en temps voulu la meilleure décision pour la bibliothèque. Les résultats indiquent également l'importance d'une infrastructure adaptée pour mettre en œuvre avec succès

l'informatique décisionnelle au sein des bibliothèques universitaires en Jordanie.

Research Data Management in Turkey

Gestion des données de recherche en Turquie

Guleda Dogan, Zehra Taskin, Arsev Umur Aydinoglu
IFLA Journal, 47-1, 51-64

Résumé : La gestion des données de recherche (GDR) est un thème important pour les organismes de financement, les universités et les chercheurs. Dans ce contexte, le principal objectif de cette étude est de rassembler des informations préliminaires pour Aperta, projet développé par le Conseil de recherche scientifique et technologique de Turquie afin d'atteindre les objectifs suivants: déterminer le niveau de sensibilisation à la GDR des chercheurs en Turquie, comprendre les pratiques actuelles en matière de GDR dans leurs environnements de recherche et connaître leur expériences des questions de politique. Pour cela, un questionnaire a été remis à 37 223 chercheurs; 1577 chercheurs y ont répondu. Les résultats montrent que ce sont les chercheurs qui travaillent le plus avec des données qui se préoccupent le plus des problèmes de gestion des données. Les niveaux d'expériences pour créer un plan de gestion des données sont plutôt faibles. L'importance de cette étude réside dans le fait qu'elle montre les pratiques actuelles des chercheurs turcs en matière de GDR alors que le nouveau dépôt de données en est à un stade de développement fondamental.

Analysis of alliance of archives, libraries and museums of South Africa National Parks: Kruger National Park

Analyse de la collaboration des archives, bibliothèques et musées des parcs nationaux d'Afrique du Sud : le Parc national Kruger

Nkholedzeni Sidney Netshakhuma

IFLA Journal, 47-1, 65-77

Résumé : Cette étude analyse la collaboration des archives, de la bibliothèque et du musée (ABM) au Parc national Kruger en ce qui concerne le respect des réglementations, le rôle des ABM dans l'éducation et l'adoption des technologies de l'information et de la communication. Une méthode qualitative a été utilisée pour rassembler les données. L'étude montre que la plupart des participants ne sont pas au courant des réglementations s'appliquant aux ABM en Afrique du Sud. Les ABM ne sont pas suffisamment utilisées

pour des activités éducatives visant à renforcer la gestion des connaissances; les technologies de l'information et de la communication sont insuffisamment adoptées comme moyen de dispenser un enseignement. Il faut espérer que cette étude contribue à concevoir des programmes de recherche pour s'attaquer aux défis sociétaux, par exemple prendre des mesures susceptibles d'avoir un impact positif sur la mise en œuvre de stratégies pour les ABM.

Copyright literacy of library and information science professionals in Bangladesh

Connaissances en matière de copyright des professionnels de la bibliothéconomie au Bangladesh

Zakir Hossain

IFLA Journal, 47-1, 78-90

Résumé : Les professionnels de la bibliothéconomie font souvent office de spécialistes par défaut du copyright au sein de leurs institutions et doivent par conséquent rester au courant des réglementations et pratiques en la matière. À l'aide de l'étude quantitative nationale « Connaissances en matière de copyright des professionnels de la bibliothéconomie au Bangladesh » menée dans le cadre d'une enquête internationale intitulée « Connaissances en matière de copyright des spécialistes des bibliothèques et autres institutions culturelles », l'objectif principal de la contribution du Bangladesh était de montrer combien les professionnels de la bibliothéconomie au Bangladesh sont selon eux familiers, experts et conscients des questions relatives au copyright, ainsi que de rendre compte de leurs opinions à ce sujet. L'étude s'est aussi intéressée aux politiques institutionnelles existantes en matière de copyright et au besoin d'une formation consacrée au copyright pour les professionnels existants et nouveaux. Elle suggère des sujets à inclure dans les activités de formation. Les résultats montrent que les professionnels de la bibliothéconomie au Bangladeshi ont des connaissances conceptuelles des questions relatives au copyright et en sont conscients, mais qu'il existe un manque global d'une approche adaptée et de formations pratiques. Cette faiblesse est encore plus flagrante parmi les professionnels de la bibliothéconomie qui travaillent pour des institutions non académiques. Sur la base de ces constatations, il est suggéré d'organiser des ateliers de formation, séminaires et tables rondes consacrés au copyright afin de jeter les bases d'un développement continu des connaissances à ce sujet.

Students' attitude towards library overdue fines in academic library

L'attitude des étudiants à l'égard des amendes pour retard dans les bibliothèques universitaires

Sangita Basak, Shamima Yesmin

IFLA Journal, 47–1, 91–100

Résumé: Dans les bibliothèques universitaires, l'obligation de payer des amendes en cas de livres rendus en retard est un phénomène globalement courant. Comme les bibliothèques universitaires s'efforcent de répondre aux attentes grandissantes des usagers disposant de ressources limitées, il est important que la collection existante soit disponible et puisse circuler. Cette étude porte sur les retours en retard à la bibliothèque de l'université BRAC au Bangladesh, et en particulier sur: les raisons pour lesquelles les usagers retournent leurs livres en retard; le niveau de satisfaction des étudiants à l'égard de la politique des retards; des suggestions d'amélioration pour les procédures régissant les retards. Cette étude a été menée en utilisant une méthode quantitative: des questionnaires structurés ont été distribués aux

étudiants et des données collectées sur une période de 60 jours entre mars et avril 2019. Parmi les 300 questionnaires distribués, 258 ont été retournés, par conséquent un taux de réponse de 86%. Les principaux motifs donnés par les usagers pour retourner des livres en retard étaient l'oubli et le fait de ne pas avoir fini le travail portant sur le livre. Un aspect positif des résultats, c'est que la majorité des étudiants étaient disposés à utiliser de nouveau les services de la bibliothèque, même après s'être vu infliger une amende pour retard; un grand nombre d'entre eux ont pu payer l'amende de leur propre poche. Les politiques appliquées par la bibliothèque ont été jugées satisfaisantes. Les étudiants les considéraient comme une mesure disciplinaire les forçant à retourner des documents au moment convenu. Leurs réactions ne montraient pas de préjugé sexiste. Parmi les suggestions d'amélioration, on peut citer l'augmentation de la collection de documents sur papier et de livres électroniques. Le résultat de cette étude devrait aider à concevoir une politique des retards/de circulation des documents à l'intention des bibliothèques universitaires dans les pays en développement.

Zusammenfassung

Sources of climate change information used by newspaper journalists in Tanzania

Von Zeitungsjournalisten in Tansania genutzte Quellen zur Information über den Klimawandel

Peter Onauphoo, Alfred Said Sife

IFLA Journal, 47–1, 5–19

Abstract: Diese Abhandlung bewertet die Informationsquellen, die von tansanischen Zeitungsjournalisten genutzt werden, um Informationen über den Klimawandel zu sammeln. Die Hauptquellen zum Klimawandel, die von Zeitungsjournalisten in Tansania konsultiert werden, sind Experten für den Klimawandel und tägliche Ereignisse wie Gemeindeversammlungen oder andere entsprechende soziale Zusammenkünfte. Von diesen Quellen wird angenommen, dass sie interaktiv den Journalisten ermöglichen Informationen zum Klimawandel zu beziehen, sie sind leicht zugänglich und sie nutzen und liefern sofortige Resonanz. Es wurde auch festgestellt, dass die unzulängliche Nutzung anderer Informationsquellen wie Bibliotheken, Druckmaterialien und Internetseiten in Verbindung mit den allumfassenden Herausforderungen, die die Zeitungsjournalisten bei

der Suche und der Erfassung der Informationen sowie der Berichterstattung über den Klimawandel behindern, möglicherweise die Qualität und auch die Quantität der Informationen beeinflusst, die zum Klimawandel in tansanischen Zeitungen publiziert werden. Alle am Kampf gegen den Klimawandel beteiligten Akteure und die Journalistenschulen sollten zusammenarbeiten und Strategien entwickeln, die darauf abzielen, die Kapazitäten von Zeitungsjournalisten, Redakteuren und Reportern bei ihrer täglichen Arbeit aufzubauen.

Information seeking behaviour of science and technology researchers in Nigeria

Das Verhalten von Forschern aus Wissenschaft und Technik in Nigeria bei der Informationssuche

Olayinka Babayemi Makinde, Glenrose Velile Jiyane, Tinashé Mugwisi

IFLA Journal, 47–1, 20–36

Abstract : Der Wissenschafts- und der Technologie-sektor spielen eine wichtige Rolle für das Wachstum und die Diversifizierung der nigerianischen Wirtschaft. In dieser Abhandlung wird das Verhalten von Forschern aus Wissenschaft und Technik (FWT) bei der Informationssuche untersucht, um den

richtigen Ansatz für die Bereitstellung von Informationen zu finden. Für die Studie wurde eine Umfragemethode verwendet und 114 multidisziplinäre FWT des Federal Institute of Industrial Research Oshodi dienten als Interviewpartner. Die Ergebnisse der Studie zeigten, dass die FWT oft ihre Informationen aus Journalen und von sachkundigen Personen bezogen; das Internet war die häufigste Informationsquelle. Die FWT nutzten Informationen unter anderem für die Durchführung von Recherchen und um persönliche Bedürfnisse zu befriedigen. Zu den Schwierigkeiten, die bei der Nutzung von Informationsquellen festgestellt wurden, gehören neben veralteten Büchern auch die mangelnde Aneignung elektronischer Dienstleistungen. Die Studie empfiehlt, dass mehr Anstrengungen unternommen werden sollten, um den Zugang der Forscher zu Informationen zu verbessern, und dass institutionelle elektronische Datenbanken gefördert werden sollten.

Business Intelligence in Academic Libraries in Jordan: Opportunities and Challenges

Business Intelligence von wissenschaftlichen Bibliotheken in Jordanien: Chancen und Herausforderungen

Faten Hamad, Razan Al Amr, Sinaria Abdel Jabbar, Hussam Fakhuri

IFLA Journal, 47–1, 37–50

Abstract : Daten spielen eine wichtige Rolle dabei, die sich ändernden Bedürfnisse der Nutzer von wissenschaftlichen Bibliotheken vollständig zu verstehen und deren Dienstleistungen und Verfahren entsprechend anzupassen. Die Daten müssen in Informationen für die Entscheidungsfindung und die strategische Planung umgewandelt werden. Business Intelligence (BI) bietet leistungsstarke Analysewerkzeuge wie Visualisierungs- und Data-Mining-Tools, die zu fundierten Entscheidungen führen. Somit verändern sie die Nutzererfahrung, indem sie sie auf ein höheres Niveau bringen. Diese Studie untersucht das Konzept von BI aus der Sicht von Mitarbeitern der Informationsabteilung von wissenschaftlichen Bibliotheken in Jordanien. Die Möglichkeiten und die Herausforderungen, die damit verbunden sind, werden ebenfalls diskutiert und erforscht. Wie die Resultate zeigen, stimmen die Angestellten der Informationsabteilungen zu, dass BI die Entscheidungsfindung verbessert, indem es den Entscheidungsträgern hilft, höchst präzise und rasche Entscheidungen für die Bibliotheken zu treffen. Die Ergebnisse weisen auch darauf hin, dass eine geeignete Infrastruktur wichtig ist, um BI

erfolgreich in den wissenschaftlichen Bibliotheken in Jordanien einführen zu können.

Research Data Management in Turkey

Research Data Management in der Türkei

Guleda Dogan, Zehra Taskin, Arsev Umur Aydinoglu
IFLA Journal, 47–1, 51–64

Abstract : Research Data Management (RDM) ist ein wichtiges Thema für Förderorganisationen, Universitäten und Forscher. In diesem Zusammenhang ist das Hauptanliegen dieser Studie, vorbereitende Informationen für Aperta zu sammeln, das von der Türkischen Anstalt für Wissenschaftliche und Technologische Forschung entwickelt wurde. Folgende Ziele sollen erreicht werden: den Grad des Bewusstseins für RDM bei Forschern in der Türkei zu bestimmen; die aktuellen RDM-Praktiken in ihrem Forschungsfeld zu verstehen; ihre Erfahrungen mit Policy-Themen herauszufinden. Zu diesem Zweck wurde ein Fragebogen an 37.223 Forscher ausgeteilt, den 1577 Forscher ausfüllten. Die Ergebnisse deuteten darauf hin, dass Forscher, die mehr Zeit auf Daten verwenden, sich mehr Sorgen um Fragen des Datenmanagements machen. Die Erfahrungswerte, einen Plan für das Datenmanagement zu erstellen, waren gering. Die Bedeutung dieser Studie liegt darin, dass sie in der Lage ist, die aktuellen RDM-Praktiken türkischer Wissenschaftler bereits in der Entstehungsphase des neuen Repositoriums aufzuzeigen.

Analysis of alliance of archives, libraries and museums of South Africa National Parks: Kruger National Park

Analyse der Allianz von Archiven, Bibliotheken und Museen südafrikanischer Nationalparks: Der Kruger-Nationalpark

Nkholezeni Sidney Netshakhuma

IFLA Journal, 47–1, 65–77

Abstract : Ziel dieser Untersuchung ist es, die Allianz aus Archiv, Bibliothek und Museum (ABM) im Kruger-Nationalpark in Hinblick auf Gesetzestreue, ihre Rolle bei der Bildung und die Einführung einer Informations- und Kommunikationstechnologie zu analysieren. Zur Datenerhebung wurde eine qualitative Methode verwendet. Die Untersuchung ergab, dass die meisten Teilnehmer die Gesetzgebung, die die ABM in Südafrika regelt, nicht kennen. Die Bildungsaktivitäten der ABM wurden nicht im vollen Umfang genutzt, um das Wissensmanagement zu

verbessern. Es gibt eine geringe Aneignung von Informations- und Kommunikationstechnologien, die ermöglichen würden, Bildung bereit zu stellen. Diese Studie wird hoffentlich dazu beitragen, Forschungsprogramme zu entwerfen, die gesellschaftliche Herausforderungen angehen, wie beispielsweise die Verabschiedung von Richtlinien, die einen positiven Einfluss auf die Umsetzung der ABM-Policy haben werden.

Copyright literacy of library and information science professionals in Bangladesh

Das Copyright-Verständnis von Bibliotheks- und Informationswissenschaftlern in Bangladesch

Zakir Hossain

IFLA Journal, 47–1, 78–90

Abstract : Fachleute aus dem Bereich der Bibliotheks- und Informationswissenschaft (BIW) agieren an ihren Instituten häufig per se als Experten für das Copyright, darum müssen sie ein Bewusstsein für das Urheberrechtsgesetz und die -praxis haben. Die quantitative nationale Studie „Das Copyright-Verständnis von BIWlern in Bangladesch“ war Teil der internationalen Untersuchung mit dem Titel „Das Copyright-Verständnis von Bibliotheken und anderen kulturellen Institutionen“. Das Hauptanliegen der Bangladesch-Studie bestand darin, die von den BIW-Fachleuten in Bangladesch selbst wahrgenommene Vertrautheit mit urheberrechtlichen Themen, ihre Kenntnisse, das Bewusstsein und ihre Meinungen dazu zu veranschaulichen. Die Studie untersuchte auch die bestehenden institutionellen Copyright-Richtlinien, den Bedarf an Copyright-Schulungen für zukünftige und für bereits bestehende Fachleute und sie schlug Themen vor, die bei Schulungen aufgegriffen werden könnten. Die Ergebnisse zeigen, dass die BIW-Spezialisten in Bangladesch zwar über ein konzeptionelles Wissen und ein Bewusstsein für Urheberrechtsfragen verfügen, dass es ihnen aber insgesamt an der Umsetzung und dem praktischen Training mangelt. Diese Schwäche ist noch ausgeprägter bei BIW-Fachleuten, die in nicht-akademischen Institutionen arbeiten. Basierend auf diesen Erkenntnissen wird vorgeschlagen, entsprechende Workshops, Seminare und Gesprächsrunden zu organisieren, die den Weg für eine kontinuierliche Entwicklung des Wissens zu diesem Thema ebnen.

Students' attitude towards library overdue fines in academic library

Die Einstellung von Studenten zu Mahngebühren bei Überschreitung der Leihfristen in wissenschaftlichen Bibliotheken

Sangita Basak, Shamima Yesmin

IFLA Journal, 47–1, 91–100

Zusammenfassung: In wissenschaftlichen Bibliotheken ist die Pflicht zur Zahlung von Mahngebühren für überfällige Bücher weltweit verbreitete Praxis. Da Universitätsbibliotheken versuchen, die wachsenden Erwartungen ihrer Benutzer mit begrenzten Ressourcen zu erfüllen, ist es wichtig, sicherzustellen, dass die vorhandene Sammlung im Umlauf verfügbar ist. Diese Studie untersuchte die Mahngebühren in der BRAC University Library, Bangladesch, und konzentrierte sich dabei auf folgende Themen: Gründe, warum Benutzer ihre Bücher zu spät zurückgeben; die Zufriedenheit der Studenten mit den aktuellen Richtlinien für Mahngebühren; und Verbesserungsvorschläge für die Verfahren bei Mahngebühren. Die Studie wurde mit einer quantitativen Methode durchgeführt. Dabei wurden strukturierte Fragebögen an Studenten verteilt und die Daten wurden über einen Zeitraum von 60 Tagen zwischen März und April 2019 gesammelt. Von den 300 verteilten Fragebögen wurden 258 zurückgesandt, was einer Rücklaufquote von 86% entspricht. Die Hauptgründe für die verspätete Rückgabe von Büchern durch die Benutzer waren Vergesslichkeit und der Umstand, dass die Aufgabe aus diesem Buch noch nicht abgeschlossen war. Eine positive Erkenntnis der Studie ist die Tatsache, dass die meisten Studierenden auch nach der Verhängung der Mahngebühr für verspätete Rückgabe weiterhin beabsichtigten, die Bibliothek zu benutzen; ein Großteil von ihnen zahlte die Mahngebühren von ihrem Taschengeld. Die derzeitigen Richtlinien der Bibliothek wurden als zufriedenstellend angesehen. Die Studierenden sahen darin einen Appell an ihre Disziplin, welcher sie veranlasste, die Medien zur vereinbarten Zeit zurückzugeben. Es gab keine geschlechtsspezifischen Unterschiede in ihrer Reaktion. Zu den Verbesserungsvorschlägen gehörte die Erweiterung der Hardcopy- und E-Book-Sammlung. Das Ergebnis dieser Forschung könnte dazu beitragen, Richtlinien für die Ausleihe und Überziehungen für akademische Bibliotheken in Entwicklungsländern zu entwickeln.

Аннотация

Sources of climate change information used by newspaper journalists in Tanzania

Источники информации об изменении климата, используемые газетными журналистами в Танзании

Peter Onauphoo, Alfred Said Sife

IFLA Journal, 47–1, 5–19

Аннотация: В данной статье дана оценка источников информации, используемых журналистами танзанийских газет для сбора информации об изменении климата. Основными источниками информации об изменении климата, которые принимают во внимание газетные журналисты в Танзании, являются эксперты по изменению климата и ежедневные мероприятия, такие как общественные собрания и другие соответствующие общественные совещания. Считается, что данные источники должны быть интерактивными с целью получения информации журналистами в вопросах изменения климата, источники должны быть легко доступными, использующими и обеспечивающими мгновенные ответы. Было также установлено, что недостаточное использование других потенциальных источников информации, таких как библиотеки, печатные материалы и интернет-сайты, в сочетании с всеобъемлющими проблемами, которые ограничивают журналистов газет в поиске, освещении и передаче информации об изменении климата, может повлиять на качество и количество информации об изменении климата, публикуемой в танзанийских газетах. Все заинтересованные стороны, участвующие в борьбе с изменением климата, а также журналистские колледжи должны сотрудничать и разрабатывать стратегии, направленные на укрепление потенциала газетных журналистов, редакторов и репортеров в своей повседневной деятельности.

Information seeking behaviour of science and technology researchers in Nigeria

Поведенческие модели поиска информации исследователей в области науки и техники в Нигерии

Olayinka Babayemi Makinde, Glenrose Velile Jiyane, Tinashe Mugwisi

IFLA Journal, 47–1, 20–36

Аннотация: научно-технический сектор играет важную роль в росте и диверсификации

нигерийской экономики. В данной статье рассматривается поведение научно-технических исследователей (НТР) в Нигерии, направленное на поиск информации, с тем чтобы определить правильный подход к предоставлению информации. Для исследования была использована методология опроса, в качестве респондентов выступили 114 междисциплинарных НТР Федерального института промышленных исследований Ошоди. Результаты исследования показали, что НТР часто получают информацию из журналов и от знающих людей; Интернет-источник был самым частым источником информации. НТР использовали информацию, в частности, для проведения исследований и решения личных потребностей. Проблемы, выявленные при использовании информационных источников, включали устаревшие книги и отсутствие внедрения электронных услуг. В исследовании было рекомендовано направить усилия на улучшение доступа исследователей к информации и поощрять создание институциональной электронной базы данных.

Business Intelligence in Academic Libraries in Jordan: Opportunities and Challenges

Бизнес-аналитика в академических библиотеках Иордании: возможности и проблемы

Faten Hamad, Razan Al Amr, Sinaria Abdel Jabbar, Hussam Fakhuri

IFLA Journal, 47–1, 37–50

Аннотация: данные играют важную роль в том, чтобы помочь четко понять меняющиеся потребности пользователей академических библиотек и соответствующим образом обновить их услуги и процедуры. Данные должны быть преобразованы в информацию для принятия решений и стратегического планирования. Бизнес-аналитика (БИ) предлагает мощные аналитические инструменты, такие как визуализация и интеллектуальный анализ данных, которые приводят к обоснованным решениям и, следовательно, трансформируют пользовательский опыт, выводя его на более продвинутый уровень. Это исследование рассматривает концепцию БИ с точки зрения восприятия сотрудниками информационного отдела академических библиотек Иордании. Возможности и проблемы, связанные с этим, также обсуждаются и исследуются. Как показывают результаты, сотрудники информационного отдела согласны с тем, что БИ улучшает процесс принятия решений,

помогая лицам, принимающим решения, принимать наиболее точные и своевременные решения для библиотеки. Полученные результаты также свидетельствуют о том, что соответствующая инфраструктура важна для успешного внедрения BI в академических библиотеках Иордании.

Research Data Management in Turkey

Управление исследовательскими данными в Турции

Guleda Dogan, Zehra Taskin, Arsev Umur Aydinoglu
IFLA Journal, 47–1, 51–64

Аннотация: управление исследовательскими данными (RDM) является важной темой для финансирующих агентств, университетов и исследователей. В этом контексте основной целью данного исследования является сбор предварительной информации для системы Aperta, которая разрабатывается Советом по научно-техническим исследованиям Турции для достижения следующих целей: определение уровня осведомленности исследователей в области RDM в Турции; понимание текущей практики RDM в их исследовательской среде; выяснение их опыта по вопросам политики. С этой целью была распространена анкета среди 37 223 исследователей, которую заполнили 1577 исследователей. Результаты показали, что исследователи, которые проводят больше времени с данными, больше беспокоятся о проблемах управления данными. Уровень опыта для создания плана управления данными был довольно низким. Важность этого исследования заключается в том, как оно может показать текущую практику RDM турецких ученых на этапе фундаментального развития нового хранилища.

Analysis of alliance of archives, libraries and museums of South Africa National Parks: Kruger National Park

Анализ альянса архивов, библиотек и музеев национальных парков Южной Африки: Национальный парк Крюгера

Nkholedzeni Sidney Netshakhuma
IFLA Journal, 47–1, 65–77

Аннотация: целью исследования является анализ альянса архивов, библиотек и музеев (ALM) в Национальном парке Крюгера с точки зрения соблюдения законодательства, роли ALM в образовании и внедрении информационно-

коммуникационных технологий. Для сбора данных использовался качественный метод. Исследование показало, что большинство участников не знали о законодательстве, регулирующем ALM в Южной Африке. ALM не была полностью использована для осуществления образовательной деятельности в целях повышения эффективности управления знаниями; отмечается низкий уровень внедрения информационно-коммуникационных технологий в качестве средства обеспечения образования. Мы надеемся, что это исследование поможет сформулировать исследовательские программы для решения социальных проблем, таких как принятие политики, которая окажет положительное влияние на реализацию политики ALM.

Copyright literacy of library and information science professionals in Bangladesh

Авторская грамотность специалистов библиотечного дела и информатики в Бангладеш

Zakir Hossain

IFLA Journal, 47–1, 78–90

Аннотация: специалисты по библиотечным и информационным наукам (LIS) часто выступают в качестве экспертов по авторскому праву по умолчанию в своих учреждениях и, следовательно, должны быть осведомлены о законодательстве и практике в области авторского права. Поэтому был использован количественный национальный опрос: “Авторская грамотность бангладешских специалистов LIS”, который являлся частью многонационального исследования под названием “авторская грамотность специалистов библиотек и других культурных учреждений”. Основная цель бангладешской части исследования заключалась в том, чтобы проиллюстрировать самоощущаемое ознакомление, знание и осведомленность о проблемах, связанных с авторским правом, специалистов LIS в Бангладеш. В ходе исследования также изучалась существующая институциональная политика в области авторского права, необходимость обучения авторскому праву новых и существующих специалистов и предлагались темы для включения в учебные мероприятия. Результаты показывают, что бангладешские специалисты LIS обладают концептуальными знаниями и осведомленностью в вопросах авторского права, но в целом не имеют прикладного подхода и практического обучения. Эта слабость еще более выражена среди специалистов LIS,

работающих в неакадемических учреждениях. На основе этих выводов предлагается организовать соответствующие рабочие совещания, семинары и круглые столы, посвященные авторскому праву, которые проложат путь к дальнейшему развитию знаний по этой теме.

Students' attitude towards library overdue fines in academic library

Отношение студентов к библиотечным просроченным штрафам в академической библиотеке

Sangita Basak, Shamima Yesmin

IFLA Journal, 47–1, 91–100

Аннотация: Обязанность штрафовать за просроченные книги является общепризнанным явлением в мире в академических библиотеках. Поскольку университетские библиотеки пытаются удовлетворить растущие ожидания пользователей с ограниченными ресурсами, важно обеспечить доступность существующих коллекций в обращении. В этом исследовании изучался вопрос о невозвращении книг в указанный срок в библиотеке университета BRAC, Бангладеш. Внимание было сосредоточено на следующих вопросах: причины, по которым пользователи возвращают свои книги позже указанного срока; удовлетворенность

студентов текущей процедурой по просроченным книгам и предлагаемые улучшения процедур по просроченным книгам. Исследование проводилось количественным методом: студентам были предложены структурированные анкеты, данные собирались в течение 60 дней с марта по апрель 2019 года. Из 300 разосланных анкет было возвращено 258, где доля ответов составила 86%. Основными причинами позднего возвращения книг пользователями были указаны забывчивость и незаконченные задания из данной книги. Положительным результатом является то, что большинство студентов не проявило нежелания снова пользоваться библиотекой даже после того, как на них был наложен штраф за несвоевременное возвращение книг; многие из них выплачивали штраф из своих карманных денег. Нынешние правила библиотеки были признаны удовлетворительными. Студенты рассматривали это как дисциплинарную меру и как способ наложения обязательств возвращать предметы в назначенное время. В их реакции не было никаких гендерных предубеждений. Предложения по улучшению ситуации включали увеличение количества печатных и электронных книг. Результаты этого исследования помогут разработать подход по вопросу просроченного возвращения/процесса обращения литературы в академических библиотеках развивающихся стран.

Resúmenes

Sources of climate change information used by newspaper journalists in Tanzania

Fuentes de información sobre el cambio climático utilizadas por los periodistas de periódicos en Tanzania

Peter Onauphoo, Alfred Said Sife

IFLA Journal, 47–1, 5–19

Resumen: Este documento evaluó las fuentes de información utilizadas por los periodistas de periódicos de Tanzania para recopilar información sobre el cambio climático. Las principales fuentes de información sobre el cambio climático consultadas por los periodistas de periódicos en Tanzania son los expertos en cambio climático y eventos diarios como reuniones

comunitarias y otras reuniones sociales relevantes. Se cree que estas fuentes son interactivas para permitir a los periodistas obtener información sobre el cambio climático, son de fácil acceso y utilizan y brindan respuestas instantáneas. También resultó que el uso deficiente de otras posibles fuentes de información, como bibliotecas, materiales impresos y sitios web de Internet, junto con desafíos generales que limitan a los periodistas de periódicos a buscar, cubrir y reportar información sobre el cambio climático, puede afectar la calidad y cantidad de la información sobre el cambio climático publicada en periódicos de Tanzania. Todos los actores involucrados en la lucha contra el cambio climático y las escuelas de periodismo deben colaborar y elaborar estrategias destinadas a fortalecer la capacidad de los periodistas, editores y reporteros de periódicos en sus actividades diarias.

Information seeking behaviour of science and technology researchers in Nigeria

Comportamiento de búsqueda de información de investigadores de ciencia y tecnología en Nigeria

Olayinka Babayemi Makinde, Glenrose Velile Jiyane, Tinashe Mugwisi
IFLA Journal, 47-1, 20-36

Resumen: El sector de la ciencia y la tecnología juega un papel importante en el crecimiento y la diversificación de la economía nigeriana. Este documento examina el comportamiento de búsqueda de información de los investigadores de ciencia y tecnología (ICT) en Nigeria con el fin de adoptar el enfoque correcto con respecto a la provisión de información. Se utilizó una metodología de encuesta para el estudio y 114 ICT multidisciplinares del Instituto Federal de Investigación Industrial Oshodi sirvieron como encuestados. Los hallazgos del estudio revelaron que los ICT frecuentemente obtenían información de revistas y personas enteradas; la fuente de Internet fue la fuente de información más frecuente. Los ICT utilizaron información para realizar investigaciones y resolver necesidades personales entre otras razones. Los desafíos identificados en el uso de fuentes de información incluyeron libros anticuados y falta de adopción de servicios electrónicos. El estudio recomendó que los esfuerzos deberían dirigirse a mejorar el acceso de los investigadores a la información y se deberían fomentar las bases de datos electrónicas institucionales.

Business Intelligence in Academic Libraries in Jordan: Opportunities and Challenges

Inteligencia empresarial en bibliotecas académicas en Jordania: oportunidades y desafíos

Faten Hamad, Razan Al Amr, Sinaria Abdel Jabbar, Hussam Fakhuri
IFLA Journal, 47-1, 37-50

Resumen: Los datos juegan un papel importante para ayudar a comprender claramente las necesidades cambiantes de los usuarios de bibliotecas académicas y para innovar sus servicios y procedimientos de acuerdo con esto. Los datos deben transformarse en información para la toma de decisiones y la planificación estratégica. La inteligencia empresarial (IE) ofrece potentes herramientas analíticas, como herramientas de visualización y minería de datos, que conducen a decisiones informadas y, por lo tanto, transforman la experiencia de los usuarios y la llevan

a un nivel más avanzado. Esta investigación investiga el concepto de IE a partir de la percepción del personal del departamento de información en las bibliotecas académicas de Jordania. También se discuten y exploran las oportunidades y los desafíos asociados con esto. Como lo indican los resultados, el personal del departamento de información está de acuerdo en que la IE mejora la toma de decisiones, ayudando a los tomadores de decisiones a tomar la decisión más precisa y oportuna para la biblioteca. Los resultados también indican que la infraestructura adecuada es importante para una implementación exitosa de IE en bibliotecas académicas en Jordania.

Research Data Management in Turkey

Gestión de datos de investigación en Turquía

Guleda Dogan, Zehra Taskin, Arsev Umur Aydinoglu
IFLA Journal, 47-1, 51-64

Resumen: La gestión de datos de investigación (GDI) es un tema importante para agencias de financiación, universidades e investigadores. En este contexto, el objetivo principal de este estudio es recopilar información preliminar para Aperta, que está siendo desarrollado por el Consejo de Investigación Científica y Tecnológica de Turquía, para cumplir con los siguientes objetivos: determinar los niveles de conciencia de GDI de los investigadores en Turquía; comprender las prácticas actuales de GDI en sus entornos de investigación; y conocer sus experiencias sobre cuestiones de política. Para ello, se distribuyó un cuestionario a 37.223 investigadores, y lo completaron 1577 investigadores. Los resultados indicaron que los investigadores que dedican más tiempo a los datos tienen más preocupaciones sobre los problemas de gestión de datos. Los niveles de experiencia para crear un plan de gestión de datos fueron bastante bajos. La importancia de este estudio radica en cómo puede mostrar las prácticas actuales de GDI de los académicos turcos durante la etapa de desarrollo fundamental del nuevo repositorio.

Analysis of alliance of archives, libraries and museums of South Africa National Parks: Kruger National Park

Análisis de la alianza de archivos, bibliotecas y museos de los Parques Nacionales de Sudáfrica: Parque Nacional Kruger

Nkholedzeni Sidney Netshakhuma
IFLA Journal, 47-1, 65-77

Resumen: La investigación tiene como objetivo analizar la alianza de archivo, biblioteca y museo (ABM) en el Parque Nacional Kruger con respecto al cumplimiento de las legislaciones, el papel de ABM en la educación y la adopción de tecnologías de información y comunicación. Se utilizó un método cualitativo para recopilar datos. La investigación mostró que la mayoría de los participantes no estaban al tanto de las legislaciones que rigen ABM en Sudáfrica. ABM no se utilizó completamente para actividades educativas para mejorar la gestión del conocimiento; hay una baja tasa de adopción de la tecnología de información y comunicación como facilitador para proporcionar educación. Esperamos que este estudio ayude a formular agendas de investigación para abordar los desafíos sociales, como la adopción de políticas que tendrán un impacto positivo en la implementación de las políticas de ABM.

Copyright literacy of library and information science professionals in Bangladesh

Alfabetización en derechos de autor de los profesionales de las ciencias de la información y bibliotecas en Bangladesh

Zakir Hossain

IFLA Journal, 47-1, 78-90

Resumen: Los profesionales de bibliotecología y ciencia de la información (BCI) a menudo actúan como expertos en derechos de autor predeterminados en sus instituciones y, por lo tanto, deben conocer las leyes y prácticas de derechos de autor. Utilizando una encuesta nacional cuantitativa: 'Alfabetización en derechos de autor de los profesionales de BCI de Bangladesh', que fue parte de una encuesta multinacional titulada 'Alfabetización en derechos de autor de especialistas de bibliotecas y otras instituciones culturales', el objetivo principal de la parte de Bangladesh fue ilustrar la familiaridad auto percibida con, conocimiento, conciencia y opiniones sobre cuestiones relacionadas con los derechos de autor de los profesionales de BCI en Bangladesh. La encuesta también exploró las políticas institucionales existentes sobre derechos de autor, la necesidad de educación sobre derechos de autor para profesionales nuevos y existentes y sugirió temas para su inclusión en las actividades de capacitación. Los resultados muestran que los profesionales de BCI de Bangladesh tienen conocimiento conceptual y conciencia de los problemas de derechos de autor, pero en general carecen de un enfoque aplicado y capacitación práctica. Esta debilidad es aún más pronunciada entre los

profesionales de BCI que trabajan en instituciones no académicas. Sobre la base de estos hallazgos, se sugiere que se organicen talleres, seminarios y reuniones de mesa redonda relevantes que se centren en los derechos de autor que allanarán el camino para el desarrollo continuo de conocimientos sobre este tema.

Students' attitude towards library overdue fines in academic library

Actitud de los estudiantes ante las multas por retraso en la devolución en la biblioteca académica

Sangita Basak, Shamima Yesmin

IFLA Journal, 47-1, 91-100

Resumen: En las bibliotecas académicas, la obligación de pagar una multa por retraso en la devolución de libros es un fenómeno mundial común. Dado que las bibliotecas universitarias intentan satisfacer las crecientes expectativas de sus usuarios con recursos limitados, es importante asegurarse de que la colección existente esté disponible en circulación. En este estudio se investigó el retraso en las devoluciones en la biblioteca de la Universidad BRAC, Bangladesh, centrándose en las razones por las que los usuarios devolvieron sus libros con retraso; la satisfacción de los estudiantes con las políticas actuales de retraso; y sugirió mejoras a los procedimientos de retraso. El estudio se realizó utilizando una metodología cuantitativa. Se distribuyeron cuestionarios estructurados a los estudiantes y se recopilaron datos durante un período de 60 días entre marzo y abril de 2019. De los 300 cuestionarios distribuidos, se devolvieron 258, lo que representa una tasa de respuesta del 86%. Las razones principales de la devolución tardía de los libros por parte de los usuarios fueron el olvido y no completar la tarea para la que requirieron el libro. Es un hecho positivo del estudio que la mayoría de los estudiantes se mostraron dispuestos a volver a usar la biblioteca después de que se les impusiera una multa por una devolución tardía; un gran número de ellos logró pagar la multa con su dinero para gastos. Las políticas actuales de la biblioteca se consideraron satisfactorias. Los estudiantes los consideraban una forma de disciplina, lo que les hacía devolver los artículos a la hora señalada. No se mostraron diferencias de género en las respuestas. Las sugerencias de mejora incluyeron el aumento de la colección de libros impresos y electrónicos. Los resultados de este estudio pueden ayudar a desarrollar las políticas de retraso y de circulación de las bibliotecas académicas en los países en desarrollo.