

A qualitative assessment of the eResearch Knowledge Centre's support practices in the Human Sciences Research Council in Pretoria, South Africa

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Abstract

Purpose – This paper aims to assess whether the current eResearch Knowledge Centre's (eRKC) research support practices align with researchers' requirements for achieving their research objectives. The study's objectives were to assess the current eRKC research support services and to determine which are adequate and which are not in supporting the Human Sciences Research Council (HSRC) researchers.

Design/methodology/approach – This study uses interviews as part of the qualitative approach. The researcher chose to use interviews, as some aspects warranted further explanation during the interview. The interviews were scheduled using Zoom's scheduling assistant. The interviews were semi-structured, guided by a flexible interview procedure and supplemented by follow-up questions, probes and comments. The research life cycle questions guided the interviews. The data obtained were coded and transcribed using MS Excel. The interview data were analysed, using NVivo, according to the themes identified in the research questions and aligned with the theory behind the study. Pre-determined codes were created in line with the six stages of the research life cycle and applied to group the data and extract meaning from each category. Interviewee responses were assigned to groups in line with the stages of the research life cycle.

Findings – The current eRKC research support services are aligned with the needs of HSRC researchers and highlight services that could be expanded or promoted more effectively to HSRC researchers. It proposes a new service, data analysis, and suggests that the eRKC could play a more prominent role in research impact, research data management and fostering collaboration with HSRC research divisions.

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Research limitations/implications – This study is limited to assessing the eRKC's support practices at the HSRC in Pretoria, South Africa. A more comprehensive study is needed for HSRC research services, capabilities and capacity.

Practical implications – Assessment of eRKC followed a comprehensive interviewee schedule that followed Raju and Schoombee's research life cycle model.

Social implications – Zoom's scheduling assistant may have generated Zoom fatigue and reduced productivity. Technical issues, losing time, communication gaps and distant time zones may have affected face-to-face interaction.

Originality/value – eRKC research support practices are rare in South Africa and most parts of the world. This study bridges the gap between theory and practice in assessing eRKC research support practices.

Keywords Research libraries, e-Research, Assessment and evaluation, Knowledge centres, Research life cycle, Research services, South Africa

Paper type Research paper

Introduction

Creating and growing the new digital scholarship in the e-research environment has become a significant part of what libraries are about today. Libraries are changing how they can support research. Although the role of librarians has naturally changed over time, [Ducas *et al.* \(2020\)](#) note that in the past decade, “the dramatic transformation in higher education, the ever-shifting research and scholarly landscape, and the unrelenting advances in technology have had a significant impact on the responsibilities of academic librarians”.

Many scholars define the concept of e-research. [Appelbe and Bannon \(2007\)](#) define e-research as a shift from paper-based to digital research. [Borgman \(2007\)](#) defines e-research as synonymous with cyberinfrastructure and technologies facilitating distributed, collaborative, information-intensive research and learning forms. [Meyer and Schroeder's \(2008\)](#) definition of e-research as the use of digital tools and data for the distributed and collaborative production of knowledge was adopted in the present research. [Martin \(2014\)](#) characterises e-research as an enhancement of the research process. Therefore, the role of research, including e-research, remains in knowledge creation and dissemination. The difference lies not in what happens during the research process but instead in how the research process is conducted, communicated and preserved ([Martin, 2014](#)).

[Devan \(2020\)](#) notes that the library's role has evolved from delivering high-quality scholarly collections and resources meeting researcher requirements to playing a more significant role in developing research staff skills and capabilities. Libraries are more focused on creating awareness of innovations and initiatives in this area, including providing seamless discovery of digital scholarly and data resources and access to these. Libraries will also share their expertise in locating such resources, using and managing them, and undertaking their preservation over the long term, with an emphasis on digital content and establishing modern physical and virtual research spaces ([Martin, 2014](#), p. 98). The role of academic libraries in support of scholarly communication activities is echoed in [Moulaison Sandy *et al.* \(2020\)](#). [Cox *et al.* \(2019\)](#) note that “one of the most significant changes to academic library services in the last decade has been the development of research data services”. A 2013 skills and competency study by the Association of Research Libraries, the Canadian Association of Research Libraries, the Association of European Research Libraries and the Confederation of Open Access Repositories found that new roles for librarians are imminent in research data management (RDM), scholarly communication and open access and digital humanities ([Schmidt *et al.*, 2016](#), pp. 5-8).

When librarians apply their existing knowledge, methods and skills to more than just digital tools, libraries can promote e-research by sharing digital scholarship throughout the organisation and the community (Mulligan, 2016, p. 10).

Background

The Human Sciences Research Council (HSRC), South Africa's statutory research agency, dates to 1968. As Africa's largest dedicated research institute, it concentrates on crucial development areas in the social sciences and humanities (Human Sciences Research Council, 2023). Its motto, "Social Science that Makes a Difference", fits its vision of becoming an all-round leader in "transformative social science research in the interests of a just and equal society" (Human Sciences Research Council, 2023). HSRC research is primarily publicly funded and valued as a public good.

Established in the HSRC's Pretoria Office in April 2018, the eResearch Knowledge Centre (eRKC) arose from the amalgamation of the Research Management and Data Curation (RMDC) unit, which included Computational Social and Spatial Analytics and the Library and Information Services (LIS) units. Its establishment arose from a convergence of circumstances, including the RMDC's external review and the HSRC's need for a researcher-supporting e-research strategy.

The eRKC is mandated to facilitate information and knowledge in the social sciences and humanities. It achieves this by delivering access to services and resources in line with the HSRC research community and stakeholder needs. The eRKC is a partner in the research endeavour, contributing to realising the HSRC's strategic research goals by providing its embedded knowledge services. Its vision is to enhance the HSRC's research capability through innovative information services (IS), geospatial solutions and digital scholarship services (DSS) (Human Sciences Research Council, 2018).

Information services

The IS unit sources and empowers users to source dependable, accurate and relevant information, data and facts. IS requests information resources through interlibrary loans from other national and international libraries, keeps researchers abreast of developments in their research areas, updates the resource collections to represent the HSRC's various research focus areas, assists with persistent digital identification and supports responsible authorship through similarity scanning services.

Geospatial analytics

This unit enables the research processes of the HSRC through Geospatial Analytics. The unit conceptualises the spatial components of the research process, ensuring geographical representativity in sample designs and conducting spatial analysis and modelling, as well as spatial and geographic information systems (GIS) research. The unit also provides GIS and spatial data. As a research support service, it works with master samples, fieldwork survey maps, spatial analysis and modelling, accessibility modelling and visualisation of research results, as well as training in visualisation and GIS.

Digital scholarship services

The DSS unit curates the HSRC research output, which includes data and research publications. The unit preserves, shares, promotes and monitors the use and impact of the HSRC research output. It facilitates the implementation of responsible conduct of research by managing research output and data policies and procedures, training researchers on

research output curation, data management and assisting them with copyright matters related to data or research publications, as well as compilation and review of data management and sharing plans.

Problem statement

Within the HSRC, researchers have always had support from the LIS team. With the inception of the RMDC team, including geospatial services, in 2011, the researchers were supported in that regard as well. Despite the many successes of these two units, organisational restructuring and the results of the RMDC review ([Human Sciences Research Council, 2017](#)) led to the HSRC creating a new model, combining the LIS and RMDC teams into one new unit. This innovative model constituted a new “recipe” for the HSRC; from it, the eRKC was born. The recipe saw staff from both units thrown together and having to work as a team, their different qualifications and backgrounds and the divergent services to be delivered to the HSRC’s researchers, notwithstanding. Moving from a more traditional research practice into the new e-research environment required additional services and support for researchers and excellent research skills and goals. Although the eRKC was established as a research enabler to support HSRC researchers, no empirical studies have been undertaken on whether this new model successfully supports HSRC researchers. The study investigated whether the eRKC-provided research support services aligned with researchers’ requirements.

To address the objective of this study, two research questions have been identified:

- RQ1.* Are the current eRKC research support services aligned with HSRC researcher requirements?
- RQ2.* Are there any new or additional services that the eRKC could implement to support HSRC researchers, and, if so, what would these be?

Objectives of the paper

The study’s main aim was to assess whether current eRKC research support practices align with researchers’ requirements for achieving their research objectives. The study’s objectives were to assess the current eRKC research support services and determine which are adequate and which are not in supporting the HSRC researchers.

Theoretical framework

Research libraries are guided by their mission statements to meet organisational targets ([Heidorn, 2011](#)). [Chiware and Mathe \(2015\)](#) write that science has entered a “fourth paradigm”, which is more collaborative, computational and data-intensive than the previous experimental, theoretical and computational paradigms. With pressure on researchers to publish their results, research libraries must support scholarship and participate in the research process ([Jaguszewski and Williams, 2013](#)). [Webb et al. \(2007\)](#) echo the library’s role in supporting research through collection management, dissemination of research findings and access to information. The e-environment, as well as the tools and services supporting the research life cycle process, are increasingly critical for researchers.

[Pasipamire \(2015\)](#) notes that scholars differ regarding the stages, components and wording of the research life cycle depictions. A defined research life cycle facilitates a proper understanding of the research process ([Vaughan et al., 2013](#)). [Raju and Schoombee \(2013\)](#) posit six steps making up the research process: prepare (scanning the research landscape);

gather (retrieving information); create (analysing the research results); share (publishing the research results); preserve (ensuring longevity and future accessibility); and measure (determining the impact of the research).

Libraries can structure their services for the various stages of the research process by applying a research life cycle model (Pasisamire, 2015). Common to every approach is setting out the various activities that researchers must engage in as the research process progresses, facilitating the determination of researchers' library needs at every research process. Determining these needs lends clarity to how and where the library can provide support in the research life cycle and which services should be offered when. The library thus forms an integral part of research and is a partner throughout the research life cycle. The research process and the services provided are linked. Aukland (2012) emphasises understanding the research process when designing suitable services for researchers, as such understanding helps to ensure that these services will match the researcher's needs. Scholars agree that the research life cycle model is relevant and suitable to provide a framework. The current study adopted Raju and Schoombee's (2013) adapted research life cycle model. Figure 1 captures the phases used as a theoretical framework to measure eRKC-provided research support practices and determine any additional HSRC researcher support needs.

The researcher interviewed eRKC staff to interrogate the activities identified in the phase concerned for each of the three models discussed.

Prepare phase

During the "Prepare" phase, the researcher chooses a topic and composes a research question. After that, the budget is calculated, funding is secured, a suitable supervisor is identified, background reading is undertaken, workspaces are identified, the project plan is created and skills workshops are attended (Raju and Schoombee, 2013).

Gather phase

In the "Gather" phase, research methods and research design are determined, a literature review is undertaken, the research proposal is written, data are collected and ethics approval is submitted (Raju and Schoombee, 2013).

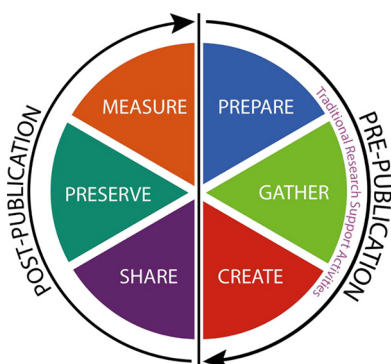


Figure courtesy of Raju and Schoombee (2013)

Figure 1.
Adapted research life
cycle (Stellenbosch
University Model of
Raju and Schoombee
(2013, p. 33)

Create phase

The “Create” phase sees the researcher undertaking to proofread, fulfilling copyright requirements and avoid plagiarism. The referencing and bibliography are completed, along with the initial writing, editing, analysis and interpretation of results (Raju and Schoombee, 2013).

Share phase

The “Share” phase includes optimising researcher visibility, building research networks, publishing and collaborating with other researchers and sourcing publishing funds (Raju and Schoombee, 2013).

Preserve phase

“Preserve” includes backing up research conducted, making research output discoverable, archiving outputs and managing/archiving data sets for sharing and future use (Raju and Schoombee, 2013).

Measure phase

“Measure” uses metrics to support funding applications, demonstrate impact and decide where the research should be published (Raju and Schoombee, 2013). While there are many reasons to measure research impact, there has been no universal agreement on how to do so. There is also no tool or system that measures impact completely. Funders and governments, meanwhile, are progressively more interested in societal impact evidence to justify their investments in research projects. Furthermore, as scholarly communication continues to evolve, the limitations of existing metrics and tools are becoming increasingly evident.

Literature review*Research support services during the research life cycle*

According to Raju and Schoombee (2013), research support refers to the librarian being proactively involved with the researcher throughout the research process. Many academic libraries already use digital tools to support e-research, including repositories, data management, curating data, data visualisation and GIS mapping. According to Adams Becker *et al.* (2017), libraries quickly adopted the digital challenge of providing scholarship support to researchers and their new way of doing research – developing, for example, shared virtual and physical places such as Knowledge Commons or Makerspace – to help with collaboration and make newly developed information technologies available. This section will review and discuss the research enabling or support services, as described in the literature, within each phase of the adopted research life cycle.

Research support services during the prepare phase

Only after a conceptual foundation has been established is the researcher free to raise questions and explore fresh ideas (Maxwell, 2016). The size and scope of a research project may require external funding, and the planning cycle is where grant options are explored. The library can assist in the discovery of potential donor organisations or funding opportunities (Maxwell, 2016). In a study by Ragon (2019), researchers were asked about their activities and their required support when planning a research project. They identified grant preparation, literature searching, methodology and identification of collaborators as items for which they would need the library’s support during the planning stage. A

study by [Liu \(2017\)](#) identified five library support functions during the research life cycle planning stage. These include research information provision, a discipline development service, the construction of discipline resources, training researchers in literature searches and building service platforms. A study done by [Kong et al. \(2017\)](#) suggests that libraries could support GIS needs with services related to spatial information, GIS technology, and methodology” and assistance with the conceptualisation of the research topic, through discussions and examples of the possible use of GIS in the project. Librarians can also suggest available spatial databases that might be useful to the researcher ([Kong et al., 2017](#)). The following research enabling/support services were included during the prepare phase: environmental scanning (identify gaps in the research and find experts or collaborators on the topic); research funding opportunities; spatial consultation and conceptualisation of research topics; partnerships with research divisions; training and orientation workshops on services and tools. Grant applications were excluded, as this service is not part of the current eRKC service offering, and HSRC Legal Services assist researchers in this regard.

Research support services during the gather phase

The planning cycle gives rise to a research proposal, either initial or complete ([Maxwell, 2016](#)). This proposal is then executed during the gather phase. From [Atkinson's \(2016\)](#) study, it is suggested that libraries include support for assisting researchers with proposal writing. Traditionally, libraries have always been the custodians of information, and the librarian's role has been to provide this information to the client. Searching for the information included the discovery and acquisition of journal articles, images, data sets and citation support through search engines, library catalogues, databases or finding experts in a specific field – either in person, through email or via list serves ([Gessner et al., 2017](#)).

According to [Raju and Schoombee \(2013\)](#), the role of librarians has shifted towards ensuring that researchers are more self-sufficient and are “knowledgeable about available resources, where to find relevant scholarly information, how to use appropriate search strategies, including choosing search terms and search databases, and how to evaluate information”. A study by [Liu \(2017\)](#) identified library support functions in this phase as that of RDM and data analysis consulting services. [Koltay \(2019\)](#) takes note of the usability of life cycle models in RDM because these models “provide a simple and understandable visualisation and, to some extent, reflect how researchers themselves perceive research”. However, a study by [Ragon \(2019\)](#) notes that no researchers made mention of the need for data management plans, although many funding agencies have made data management plans mandatory for grant applicants and many libraries support the use of such data management plans. It is also a promising research practice to keep track of the data for comparison in cases where other researchers fail to produce the same results. Any data that support a researcher's claims and results should be archived. [Hamad et al. \(2021\)](#) note that data is an essential part of research that should be managed, preserved and shared.

In the study done by [Kong et al. \(2017\)](#), it is noted that library services to support GIS need to relate to the organisation of data, the collection of field data and the data publication. For this paper, the data analysis expectation is excluded as data analysis diverges from projects, and it is impossible to commit one of the eRKC staff to each project's data analysis. The four services included were: literature review/access to resources; field data collection

support; support with ethics applications; and data management planning and metadata support.

Research support services during the create phase

In the create phase of the research life cycle, the researcher has completed the data collection and writes up the research study findings. For libraries, strategically speaking, this would be the perfect opportunity to assist with the writing and editing of emerging reports or papers (Maxwell, 2016). If the organisation has a writing centre, this will be the perfect opening for the library to partner with this centre. This library/writing centre combination is ideal for hosting writing workshops and training researchers on their intellectual property rights (Maxwell, 2016). Libraries need to promote institutional repositories for increased visibility, advise authors on intellectual property rights, advocate for open access and balance the rights of authors and users alike (Nilsson, 2016). Reference services have always been one of the core functions of libraries. Automating bibliographies and developing citation management tools, such as Endnote and RefWorks, have created new opportunities for libraries to engage with researchers and provide training to use these tools (Maxwell, 2016). Without becoming the organisation's copyright police, libraries are ideally placed to train users in proper citation methods, the dangers of plagiarising and whichever of the relevant tools, for example, Turnitin or iThenticate, is available to them (Zimerman, 2012). The following three services were included in this study: copyright and intellectual property rights, avoiding plagiarism and reference management.

Research support services during the share phase

The dissemination or sharing of research results or findings refers to sharing these findings with stakeholders and a wider audience. Sharing research findings is critical for research uptake, which is important for long-term research networks' success and sustainability. It is therefore not surprising that researchers agreed on publishing in peer-reviewed journals when asked about activities to disseminate research results (Ragon, 2019). As licensing slowly replaces purchases, the role of libraries is to advise researchers on the types of usage licences for their publications in open access journals (Raju and Schoombee, 2013). Another strategic move, Maxwell (2016) suggested, would be for libraries to move into the publishing space. Being a partner with the organisation's publishing unit or press can result in the library's involvement in the research life cycle from the idea planning stage to the final publication of the article, book or chapter (Maxwell, 2016).

One of the extended services suggested by Bruxvoort and Fruin (2014) is that of the library managing the researchers' scholarly identity through Open Researcher and Contributor ID (ORCID). Four research enabling/support services were included in the share phase: researcher visibility; open access as a publishing option; sourcing publication funds; suitable accredited journals; licensing. The library as a publisher was excluded, as this service does not fall within the eRKC mandate. However, the eRKC fosters a good working relationship with the HSRC Press and collaborates with the HSRC Press on various projects.

Research support services during the preserve phase

Within the preservation stage of the research life cycle, the organisation's research output is preserved and made available for reuse. Academic libraries often play a significant role in preserving and reusing, as they provide the infrastructure to enable these activities. Atkinson (2016) agrees that libraries should include institutional repositories and data

curation as supporting services. [Hamad et al. \(2021\)](#) note that libraries must engage in curating, advising and preserving research output. Data curation and preservation services are also suggested by [Raju and Schoombee \(2013\)](#) as a critical new service offering. The library's expertise in the data curation process is critical to securing data sets and making them available. Data sets are the knowledge backbone of multi-year research projects ([Maxwell, 2016](#)).

Of vital importance at this point in the research life cycle is metadata services. Appropriate metadata maximises the organisation's scholarly output ([Maxwell, 2016](#)). The purpose of preservation is to protect information of enduring value for access by present and future generations. The risk of digital information loss due to disappearance after being published for a brief period, the fragility of the files, and technology obsolescence have all proved difficult to swallow for librarians, whose essential function in society is to archive information. [Shaffer \(2013\)](#) also acknowledges the challenges faced in storing data and making it available for analysis and reuse. Regarding geospatial services, the study by [Kong et al. \(2017\)](#) found that libraries should negotiate for more capacity to host geospatial data for future use. Three research enabling/support services are included in the preserve phase of the current study. These are research output repository development, metadata services and long-term preservation and promotion of research output. Engagement with the information technology unit to facilitate curation processes, storage and dissemination as well as mitigate risks of digital information loss takes continuous effort from the eRKC. However, engagement is not included in this study because it is an indirect service to the researchers.

Research support services during the measure phase

Bibliometrics are often used to measure research impact. The term refers to a set of methods to quantitatively analyse publication patterns within a given field of literature ([Raju and Schoombee, 2013](#)) and can improve the visibility of research output ([Raju and Schoombee, 2013](#)). Quantitative methods, such as citation counts, the h-index and journal impact factors, are some of the most-used impact measures in libraries today. Altmetrics, on the other hand, offer opportunities for libraries and librarians to maintain currency in research and scholarly production processes and illustrate their value to researchers in new ways ([Rodgers and Barbrow, 2013](#)). Altmetrics refer to newer impact measures that are not meant to replace bibliometrics but rather to complement them by holding the reader's attention online and ensuring engagement with the material, such as in social media and other online content interactions. Bibliometrics and Altmetrics as research enabling/support services were included during the measure phase, while awareness raising and training on metrics were included in the prepare phase, along with the other workshops and orientation sessions.

Research methodology

This study uses interviews as part of the qualitative approach. According to [Creswell \(2014\)](#), interviews are intended to elicit views and opinions from the participants. Due to the length of the quantitative collection instrument, to ensure that all the necessary services would be covered, the provision for views or opinions could not be extensive. Accordingly, the researcher interviewed eRKC staff to obtain views and opinions on the current eRKC research service and researcher requirements for achieving their research goals. The interviews were scheduled using Zoom's scheduling assistant. Upon the interview request acceptance, the researcher deleted the appointment to not compromise the interviewee's identity.

The researcher obtained permission from interviewees to record the interview, thus preventing information loss and improving the attention paid to participants. Interviewees were requested to sign the consent form before the interview started. While transcribing, the researcher focused on relevant concepts while applying sound ethics and discretion. The audio transcripts were anonymised after the interview, and the interviewee was given an alias interview number known only to the researcher. The interviews were semi-structured, guided by a flexible interview procedure and supplemented by follow-up questions, probes and comments (DeJonckheere and Vaughn, 2019). The researcher gathered open-ended data and delved deeper into responses needing further clarification.

The research life cycle questions guided the interviews and helped determine the views and opinions with respect to eRKC services. The data obtained was coded and transcribed using MS Excel. Frequency relationships between the various responses were highlighted, and mutual themes were identified as per the research life cycle phases.

Purposive sampling was chosen to interview the eRKC staff for the qualitative data collection. Leedy and Ormrod (2015) suggest that in purposive sampling, people or other units are chosen, as the name implies, for a particular purpose. From Table 1, nine interviews took place: three with IS staff, three with DSS Staff and three with Geospatial Analytics staff. Of the nine interviewees, one held an undergraduate degree, two held honours degrees, four held master's degrees and two had doctoral degrees. The qualifications covered a wide range, with not all the staff holding library or information science qualifications, as might usually be expected within a library environment. Nonetheless, all the qualifications were appropriate in terms of the expectations of the interviewees in their specific roles within the eRKC.

The interview data were analysed, using NVivo, according to themes identified in the research questions and aligned with the theory behind the study. Leedy and Ormrod (2015) state that the first step in the meaning-making process is to identify a list of potentially helpful ways of categorising and coding the data. Pre-determined codes were created in line with the six stages of the research life cycle and applied to group the data and extract meaning from each category. Interviewee responses were assigned to groups in line with the stages of the research life cycle.

Results

Research enabling services during the prepare phase

The majority (8) of interviewees thought this service was necessary for researchers. The reasons for their answers can be summarised as providing researchers with internal and external information about what has previously been done on the topic, identifying gaps and opportunities, answering any questions the researcher has about the topic, providing background information and keeping up with trends in the field.

| eRKC staff members | Purposive sampling for personal interviews |
|---|--|
| Staff within Information Services (IS) | 3 |
| Staff within Digital Scholarship Services (DSS) | 3 |
| Staff within Spatial Analytics (GA) | 3 |
| <i>Total</i> | <i>9</i> |

Source: Table by authors (2023)

Table 1.
Sampling for the
qualitative data
collection

Seven interviewees believed the eRKC does provide a high-quality environmental scanning service. In summary, their responses point to the information consultants (ICs) doing an excellent job, and one interviewee commented on the close relationships that ICs have with the researchers and that they are “capable [of providing] excellent guidance and advice”. One interviewee believed the service could be better and the existing limited resources could be improved.

Spatial consultation and conceptualisation of a research topic

Three interviewees believed this service to be necessary. One believed it to be quite significant, and two believed it to be necessary. Three interviewees indicated that the importance of this service depended on the research project and the area of study. Spatial conceptualisation is not necessary for every project, according to these interviewees.

Interviewees believed that the eRKC does provide a high-quality spatial conceptualisation service overall. The name of the Geospatial Analytics unit was mentioned in all the interviewee responses, and this unit was deemed to be dedicated, very experienced, knowledgeable and expert in this field (all interviewees). In addition, two interviewees felt that, although the eRKC is doing an excellent job, more could be done in terms of fieldwork to avoid unnecessary errors when curating the data, while another interviewee believed that this service should happen at the beginning of a research project and not somewhere in the middle or end. This interviewee also expressed his concern that HSRC researchers were always in a rush and often realised too late that they needed this service.

Identifying research funding opportunities for researchers

All nine of the interviewees answered the question with an overwhelming “yes, especially important”. The majority repeated the “no funding, no research” observation. Four interviewees responded that they did not know whether the eRKC provided this service, while another four indicated that it was provided at a high standard. One interviewee thought that the eRKC might provide this service at a high standard, as the ICs communicate about funding opportunities. Another response notes that the eRKC provides a high-quality service but that he/she was not aware of the tools used to track these opportunities. One interviewee felt that the eRKC could do more to identify these funding opportunities for researchers, as the eRKC subscribes to only one tool, Research Professional. On this exact point, the interviewee commented that another unit in the HSRC had taken over the operation of Research Professional and that the eRKC was no longer using it.

Training and orientation workshops on the services

All the interviewees believed that attending the eRKC-hosted orientation and training workshops should be particularly important to researchers. Most of the responses mentioned that these workshops are important as they provide researchers with an overview and in-depth knowledge of the services, thereby reducing the gap of not knowing where to ask for help and creating awareness about the services of the eRKC. A further comment by Interviewee #7 notes that researchers should “involve the eRKC at the initiation of research projects as the unit can assist them to make a difference with the services we have on offer”. Interviewee #9 suggested that the eRKC should focus its training workshops on “teaching so that they can do it for themselves – empower them”. Another interesting comment came from Interviewee #6, who stated that attending these training workshops should be important to researchers but that, for some reason, they do not think it

is essential. This interviewee suggested a digital portal that could be casually navigated so that researchers could get the necessary workshops.

Research enabling services during the gather phase

All the interviewees indicated that they believed access to valuable, high-quality information resources is essential for researchers. The reasons they supplied are summarised as the need for the latest detailed information, how the latest high-quality information influences high-quality research, and that access to these resources reveals patterns and research trends. Not only does access to valuable and high-quality information resources ensure better research results, but according to one interviewee, it also creates a high-calibre researcher who will be up to date with trends in these fields/topics.

All nine interviewees indicated that the eRKC delivers a high standard of access to valuable and high-quality information resources. The majority indicated that the eRKC subscribes to core journal packages of high value. The portal, which includes various databases, was seen as beneficial, up to date and being renewed when due. One interviewee mentioned the usage reports managed in the IS unit and how using them makes it possible to track the downloads from all the databases and spot the gaps by looking at the “denials” reported. The print collection and repositories for data and publications were also mentioned as valuable resources. Three interviews expressed their support for the ICs who go beyond the call of duty to find information, even where the relevant subscriptions are not held.

Data management planning and completing a data management plan(s)

Eight of the interviewees believed that this service is vital to researchers. Most listed reasons such as having a plan, avoiding data errors and proper data management planning. One interviewee noted that “researchers need it. They do not know what to do with their data”. Another interviewee stated that “adhering to the plan will ensure scientifically correct data. This interviewee further commented that proper data management planning is essential to avoid the well-known ‘garbage in, garbage out’ effect”. Four interviewees believed that the eRKC provides a high-quality data management planning service. They believed that the eRKC has skilled staff to provide the service researchers need. Two interviewees responded by saying they were not sure if the eRKC provided this service, feeling that the eRKC could improve on this service.

Reviewing data management plans as part of the ethics application process

Six interviewees believed that this service was essential to researchers. Some of the reasons mentioned for this importance include avoiding ethics issues and problems later in the study and adhering to the ethics needed when applying for funding. Only four interviewees believed the eRKC provided this service at a high standard. They mentioned reasons such as good engagement with the researchers and that this service ensured that excellent quality data would be deposited for curation. Interestingly, the remaining five interviewees were not sure whether this service was provided at a high standard, which might indicate that they did not have much awareness of this service.

Consultations and support in the collection of field data

Seven of the interviewees stated that the service was essential to researchers. In the words of one interviewee, “Most errors happen in the field. By providing support, errors can be limited and fixed in time for data collection”. Another interviewee thought GIS was important to show areas to visit in a project, adding that “old images of rural images of rural

areas are not accurate and need GIS support”. According to one interviewee, the importance of consultations and support in collecting field data varies according to the project concerned. He provided this opinion because where the service is needed, it can help limit data errors.

Awareness of services on consultation and support in collecting field data

Eight of the nine interviewees indicated that they were aware that the eRKC provides this service. Most of the eight who answered this way also mentioned that they were aware of the Geospatial Analytics team doing these consultations. One of these interviewees mentioned that DSS also engages in consultations, but not always successfully. Most of the interviewees were uncertain whether the eRKC provides a high-quality service in this regard and provided reasons such as the eRKC delivering only a partly high-quality service or the eRKC not being there from start to finish.

Research enabling services during the create phase

Clarifying copyright and intellectual property rights. Seven interviewees believed clarifying copyright and intellectual property rights to be necessary for researchers. Reasons to support their opinion include the importance of their contributions and understanding the rights of what you can do with the publication, protecting your work and not signing away your copyright unnecessarily. Three interviewees indicated that they were uncertain whether the eRKC provides this service of clarifying copyright and intellectual property rights at a high standard. One interviewee indicated that she believed that the eRKC provides a high-quality service only regarding research publications and data sets while clarifying rights is left to legal services. Three interviewees believed that the eRKC was providing high-quality service in this regard.

Guidance on citation styles, citations and references to researchers

All nine interviewees indicated that guidance on citation styles, citations and referencing is essential for researchers. The majority mentioned that it is that references and citations are done properly and consistently and to give credit where it is due as reasons for their answers. Seven interviewees believed that the eRKC provides a high-quality service regarding citation styles and reference management. They used the example of training presented by the eRKC on using Mendeley and RefWorks to manage references. In addition, they mentioned the role of the ICs who are knowledgeable on reference management and who play a significant role in the awareness of and training on how to use a reference manager.

Guidance on plagiarism

All nine interviewees indicated that guidance on avoiding plagiarism is an essential service to researchers. Reasons such as unethical conduct and reputation damage for the researcher and the research organisation. Eight interviewees believed that the eRKC provides an excellent service to researchers in this regard. Most interviewees mentioned the tool iThenticate, which provides a good similarity report for researchers to avoid plagiarism.

Research enabling services during the share phase

Professional information being updated on platforms such as open researcher and contributor ID. Eight interviewees indicated that this service is essential to researchers. This platform creates more visibility or exposure for the researcher and assists in reusing reusing, sharing

and citing their work. One interviewee (#9) also indicated the importance of ORCID for South Africa's National Research Foundation (NRF) ratings. Five interviewees believed that the eRKC provides a high-quality service by updating the professional information of researchers on platforms such as ORCID. The ICs were again mentioned as crucial players in creating awareness and training researchers on these platforms. One interviewee indicated that more workshops are necessary in this regard and that the eRKC should raise awareness among researchers so that they will take this activity seriously. Another interviewee specifically mentioned the inconsistencies between author profiles in Scopus, Google Scholar and ORCID.

Creative commons licensing

Seven interviewees all believed that this service was essential to researchers. They mentioned reasons such as knowing the various licences and their meaning and how the document can be shared, copied or replicated. Interviewee #2 stated that "licences enable the usage and clarify ownership of research output". Interestingly, five of the interviewees were uncertain whether the eRKC provides this service currently. Two interviewees indicated that they did not think the eRKC offered this service, as it was a task for legal services. The remaining two interviewees were aware of this service being offered and believed the eRKC would provide this service at a high standard. They provided reasons such as "licensing is the default for the basis of sharing data sets" and "using best practices is crucial" (Interviewee #2).

Guidance in selecting suitable accredited journals to publish in

All nine interviewees indicated that it is essential to researchers that the eRKC guide them in selecting accredited journals to publish in. Selecting accredited journals was seen as beneficial to researchers' visibility, credibility and ability to qualify for research funding. The growing issue of predatory publications and publishers and avoiding these fake/dodgy publishing practices were raised in most interviewee responses. Eight interviewees responded yes to whether the eRKC provides this service at a high standard. The majority mentioned the availability of the list of accredited journals available on the Virtual Library platform and the deeply knowledgeable staff who assist in guiding the researchers to choose suitable journals to publish in. The Virtual Library platform acts as a hub of information for researchers. The eRKC develops it, and resources, accreditation lists and access to repositories and contact details of eRKC staff are facilitated through this platform. Again, the ICs were mentioned several times as being at the forefront of this service. The impact assessment reports done by the IS team also received some mention. One interviewee raised the concern that, although the eRKC is the knowledgeable unit that advises on these accredited journals, researchers do not always heed the advice given and go ahead and publish in non-accredited journals.

Raising awareness of open access as a publishing option

All nine interviewees believed that raising open access awareness is essential to researchers. Some of the reasons included were the extreme costs of creating research output and that being able to publish it to a broader audience via open access makes sense. It was also felt that publicly funded research should be shared in open access, providing easy access to information that would otherwise not be accessible. Five interviewees believed that the eRKC provided a high service standard in this regard. They mentioned the IC raising awareness about open access, training sessions on open access and a good workflow process. Three interviewees stated that the eRKC could do more to raise awareness, change

perceptions of the negative view of open access and influence researchers to use open access as a publishing option.

Establishing a publication fund for publishing

Eight interviewees indicated that this service was important to researchers. Interviewees mentioned the prohibitive costs of publishing in journals. One interviewee expressed their opinion regarding the importance of having a central place to see where the HSRC researchers usually publish and that this information could influence other researchers to do the same. Four interviewees indicated that they believed the eRKC is providing a high standard of service in this regard. They mentioned good article processing charges workflow and investment in the service over the past two years to ensure a faster, more streamlined process as reasons for their answers. One interviewee felt that the eRKC is not doing enough to promote this service and that researchers are unaware that this fund exists.

Research enabling services during the preserve phase

The development of research output repositories through accurate curation for storing, sharing and future use. All the interviewees agreed that this service is essential to researchers, as these repositories highlight their intellectual property, store it for future use, share it for reuse and make it easily accessible to a broad audience. Using archived information in a repository also makes it easy for researchers to find historical data, build on what has been done before, find loopholes and not repeat the research. Interviewee #2 summarised it nicely: “repositories are the home of research output”. All interviewees believed that the eRKC provided repositories at a high standard. Some comments were about resolute teams, good processes and ease of use. Many interviewees also commented on the high-quality information available in the repositories. One interviewee indicated that the eRKC should archive more information to improve their already excellent service.

Applicable metadata for research output repositories

All nine interviewees expressed that this service is essential to researchers. One interviewee noted that “applicable metadata is as important as the data itself”. Many interviewees referred to the advantages of discoverability, sharing and finding resources with proper metadata. All the interviewees believed that the eRKC provides this service at a high standard, as the eRKC has many knowledgeable staff members within IS and DSS to assist with high-quality standardised metadata. One interviewee further indicated that the metadata the eRKC provide is detailed. The integration of resources in the eRKC with applicable metadata is 96% completed, as noted by another interviewee.

Long-term preservation (more than 15 years) of research output

All nine interviewees indicated that they believed this service to be necessary to researchers. Interviewee #4 noted that long-term preservation allows for the analysis of historical data, and the more that is stored, the better. Interviewee #6 concurred with this opinion, stating, “South Africa is a unique country, with unique studies that build a historical profile of the country”. Interviewee #9 used the example of historical data for the Spanish Flu and SARS virus as instrumental in research for COVID-19 and asked, “Where would we be without the historical data?” Two interviewees believed the eRKC does its best to store research output, but that preserving it for more than 15 years might not be possible due to infrastructure challenges. Two interviewees (#6 and #8) were unsure if the eRKC does long-term preservation. The remaining interviewees indicated that the eRKC does provide this service

at a high standard, using data preservation folders and the research management system (that is backed up) and storing files in a long-term preservation format, such as PDF_A.

Promoting research output

All nine interviewees believed promoting research output was important to researchers. Reasons for visibility, sharing and reuse of the organisations' work were mentioned here. Overall, the interviewees were positive about this service being provided at a high standard. The majority felt that the eRKC is providing a good service in terms of open access, ease of access and storage of research output and trying its best to promote research output via various channels. One interviewee felt that research publications generally have more impact than research data because the data sets are not cited. According to one of the interviewees, the HSRC's impact assessment reports show high citations for certain journal articles but, in general, the h-indexes of HSRC researchers are low. It is, therefore, the overall feeling of the interviewed staff that more could be done to promote the HSRC's research output via social media and find other platforms that might work as well.

Research enabling services during the measure phase

Tracking the impact of their research through bibliometrics. All the interviewees believed that tracking impact through bibliometrics is essential to researchers. Reasons provided include impact assessment, NRF ratings, higher citations, h-indexes, tracking impact to see where researchers can improve, attracting funding and showing the relevancy of the HSRC. Five interviewees believed that the eRKC does provide a high-impact service in this regard. They all mentioned the detailed and high-quality impact assessment report the IS team provided.

Tracking the impact of their research through almetrics

One interviewee indicated he did not think this service was all that important to researchers. He explained that critical alternative metrics are less critical than bibliometrics for impact reporting. The remaining eight interviewees all believed that Almetrics is vital to researchers. Interviewee 3 had an interesting comment regarding the research world and societal impact: "The research world is very 'boring', and the societal impact can liven up the research and encourage researchers". Interviewee 6 agreed with this statement, stating that the HSRC is a research organisation that does societal impact research; therefore, it is essential to track this type of impact. Interviewee 8 mentioned that Almetrics is "the new kid on the block" and "the new normal" and should be a service provided to the HSRC researchers. Interviewees #5, 6, 7 and 8 noted that the eRKC could do better. They mentioned using PlumX as an impact measurement tool but also that more products should be investigated.

Discussion

This study intended to assess the current research support services provided by the eRKC in support of the HSRC research staff in achieving their research goals and to list any additional services that might be necessary to support the HSRC researchers. The recommendations resulting from the investigation are divided into categories for the eRKC to consider regarding their research support services during the research life cycle.

Proactive marketing of services has been less imperative in traditional libraries. With the developments within the information and communication technologies (ICT) sector, new legislation and traditional research practice are steered towards a more digital research

practice policy. Libraries must continuously prove the value of their services in this unfamiliar environment. According to [Vaughan et al. \(2013\)](#), libraries should make a reasonable effort to enhance their visibility among researchers. [Raju and Schoombee \(2013\)](#) also refer to librarians being proactively involved with the researcher throughout the research process. The eRKC is a distinctive service not available to university researchers, but HSRC researchers do not fully use it. Senior research staff are extremely busy and do not read every email sent to them by the eRKC and other units. The interview results also support the notion that there is insufficient awareness among eRKC staff as regards current research support services being offered. The eRKC's online visibility is also an aspect that needs attention. The effective marketing and online visibility of the eRKC's services is, therefore, crucial to ensure the support services on offer are visible and accessible in support of the HSRC researchers.

With the inception of the eRKC unit in 2018, the three sub-units, IS, GA and DSS, were incorporated into the eRKC with a shared vision of innovation development and strategic collaboration with research units. Although the eRKC prides itself in building capacity via brief workshops during staff meetings, this venture will be futile if many staff indicate that they are unsure of or unfamiliar with the research offerings. A suggestion to overcome this problem might be implementing an internal education drive, followed by testing to ensure that the unit staff are all aware and knowledgeable about the services on offer.

From the interview responses, it was clear that eRKC staff wanted more successful collaboration with the research units. One interviewee mentioned that although the eRKC tries to collaborate with units, it is primarily unsuccessful and that researchers attempt to involve the eRKC only late in the process, thus limiting its effectiveness. For the eRKC to be an integral part of research and as a partner throughout the research life cycle ([Vaughan et al., 2013](#)), collaboration and partnerships between the eRKC and research divisions are critical.

It is incumbent upon academic libraries to train researchers in the areas that they require ([Atkinson, 2016](#)). HSRC researchers' responses indicated that they believed training on the various eRKC services to be necessary for their work. Purposefully arranged orientation and training sessions for new and established staff, geared to the researchers' specific needs, are important. A suggestion would be to organise the training workshops according to the research life cycle to avoid missing essential activities in each phase. In addition, future awareness training on metrics for research impact is recommended, as interviewees indicated the importance of training on this topic for their work.

[Chiware and Mathe \(2015\)](#) recommend more advocacy for RDM, and academic and research libraries are urged to take the lead. Although interviewees (eight responses) believed data management to be necessary, several of them indicated that data management planning and guidance to complete a data management plan is required at a higher level. They mentioned that not all research divisions within the HSRC employ a data manager and that the eRKC can play a significant role in assisting in this regard, especially in the case of those units without a data manager. Proper data management planning could eliminate errors in the data when it is collected and could also lessen the data cleaning necessary during the curation process. One interviewee mentioned that the eRKC could do more to assist researchers with depositing data for curation, as the current process is very cumbersome. The eRKC is responsible for making this process easy for researchers to ensure that more data is submitted and curated to create visibility and reuse. A solution could be to add data management planning in more detail to the training workshops and to make data management planning more visible via the eRKC online platform.

In the words of one of the interviewees, one area that perhaps warrants further investment is the use of advanced database and algorithmic approaches to analyse HSRC data and to build the capacities of the HSRC to do this kind of work. The expectation of data analysis as a service in this study was excluded. Although it is essential, together with RDM, in the Gather phase, it would be impossible to commit one of the eRKC staff to data analysis for each HSRC project. Kong *et al.* (2017) suggest that libraries should include data analysis in their training workshops instead of taking data analysis on themselves to allow researchers to be more self-sufficient.

One of the eRKC's objectives is to contribute to research excellence and to support the drive towards research impact. According to Raju and Schoombee (2013), one of the reasons metrics are used is to show impact. Although not only one universal method exists to measure impact, funders and governments are becoming increasingly interested in the evidence of societal impact. With the developments in the ICT sector, the current metrics increasingly show their limitations, and more must be done to measure research impact. One interviewee suggested:

Think of ways to improve and measure the engaged scholarship profile of HSRC's work. In other words, and related to impact, track how research outputs are having or could have a more tangible impact in communities' social and economic dynamics.

Another interviewee indicated that one area that perhaps warrants further investment is the use of advanced database and algorithmic approaches to analyse HSRC data and the building of the capacities of the HSRC to do this kind of work. One interviewee requested that the HSRC's impact assessment report be shared with all colleagues in the eRKC.

Einstein and Parker (2012) recommend that academic libraries inspect their research support practices using the research life cycle model as a guideline. Vaughan *et al.* (2013) note that the library should be part of the entire research process and that research support services should be based on a research life cycle model. The research life cycle model, as used in this study, can effectively link the services of the eRKC to the activities and phases of the research life cycle model. Based on this framework, future services and research-related interactions can be developed effectively to align with researcher requirements.

The insights the researcher, as an HSRC employee, gained from the results in this study could guide effective expansion and awareness promotion of research support services to HSRC researchers.

Implications for research and practice

The current study investigated whether the eRKC-provided research support services align with HSRC researchers' requirements. The researcher aimed to provide insights into the eRKC's critical role in better enabling e-research practices in general and at the HSRC specifically. The eRKC management, HSRC research staff, other science councils and similar research organisations stand to benefit from the outcomes of this study.

Suggestions for further research include an in-depth evaluation of each of the services as they currently stand or a qualitative study to determine reasons and explanations for researchers' use or non-use of the eRKC services, to look into the entire HSRC staff's research needs or requirements, if any, and not to only apply it to research staff, a focus on the role of management in establishing enabling e-research services and it is suggested that further studies might look into the attitude and perceptions of management towards the role of the eRKC in e-research, an investigation to how the research support services of the eRKC differ within the different science councils in South Africa and perhaps what the HSRC could learn of how services in other science councils enable e-research, tracking impact and the

possibilities to enhance impact, how to build a data analysis capacity within the HSRC and possible in other science council, the link between the current Impact Centre and eRKC within the HSRC and finally, creating a more visible data management planning service for the HSRC and how this could be expanded to other science councils.

Conclusion

The study's findings have illustrated how the research life cycle model could be effectively overlaid on the eRKC's services, thereby determining whether researchers' needs are aligned within each phase. This study indicated that, overall, the current eRKC research support services are aligned with the requirements of the HSRC researchers. The feedback shows that HSRC researchers found most of the services essential to their daily work and were satisfied with the services they had used. A new service, data analysis and building data analysis capacity within the HSRC, was proposed in addition to the current eRKC research support services. Furthermore, the study enabled the researcher to highlight the research support services that could be expanded or better promoted to the HSRC researchers. Many other opportunities, such as an improved eRKC landing page, expanded impact assessment, better collaboration with research units, researcher orientation and training workshops and RDM. Receiving quality research support services from the eRKC directly impacts the HSRC researchers' productivity and achieving research goals, ultimately creating a high-calibre researcher within an excellent research organisation.

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Further reading

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