

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

by

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**submitted in accordance with the requirements for
the degree of**

Master of Philosophy in Digital Curation

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DECLARATION

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DEDICATION AND ACKNOWLEDGEMENTS

This dissertation is dedicated to all the undermentioned who have played such a significant role in my achievement and whom I would like to thank from the bottom of my heart.

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PREFACE

The reader should note that this thesis is presented in accordance with the requirements for the degree of Master of Philosophy in Digital Curation at the University of Cape Town.

The layout, in-text references and reference lists are in accordance with the guidelines as prescribed in the UCT Author-date Reference Guide: based on the Harvard referencing style (2016).

The student, Ms Baudin, was responsible for all aspects of the research, including matters such as identifying the research problem, formulating the research questions, the research design and execution of the research.

Dr Patrick Mapulanga was the supervisor of this thesis and was responsible for the academic guidance and critical reading.

ABSTRACT

The purpose of this study was to determine whether the eResearch Knowledge Centre's (eRKC) research support services are in line with the needs of Human Sciences Research Council (HSRC) researchers. It was also intended to identify gaps in services that could be filled by additional services.

The pragmatic research paradigm was used to guide the conduct of this study. This paradigm refers to a worldview that prioritizes what works in practice over what is absolutely and objectively true or real. The Research Lifecycle Model was chosen as a theoretical framework for this study because of its foundation in this paradigm. To collect data, a multi-methods cross-sectional descriptive design was used, employing both quantitative and qualitative methods. The two methods were used concurrently. A questionnaire was distributed to 156 members of the HSRC research staff in order to collect quantitative data. Interviews were conducted with nine eRKC staff members who were part of the sample to collect qualitative data. A Likert scale was used to determine whether a participant agreed or disagreed with the statements.

The quantitative data analysis was done using SPSS, while the interview data were analysed using Excel. Both the quantitative and qualitative data were aligned with the six phases of the research life cycle.

The findings demonstrated the effective targeting of current eRKC research support services to specific phases of the research life cycle model. The needs of HSRC researchers could be determined in each phase using this model. According to the study findings, the current eRKC research support services are aligned with the needs of HSRC researchers and highlighted 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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ABBREVIATIONS AND ACRONYMS

ACRL	Association of College and Research Libraries
CARL	Canadian Association of Research Libraries
COAR	Confederation of Open Access Repositories
DSS	Digital Scholarship Services
EC	Ethics committees
eRKC	eResearch Knowledge Centre
GA	Geospatial Analytics
GIS	Geographic Information System
HSRC	Human Sciences Research Council
IC	Information Consultant
ICT	Information and Communications Technology
IRB	Institutional review boards
IS	Information Services
JISC	Joint Information Systems Committee
LIBER	Association of European Research Libraries
LIS	Library and Information Services
NRF	National Research Foundation
RDM	Research Data Management
RMDC	Research Management and Data Curation
UCT	University of Cape Town

CHAPTER 1: INTRODUCTION AND OVERVIEW OF THE STUDY

1.1 Introduction

The Human Sciences Research Council (HSRC), South Africa's statutory research agency dates from 1968. As Africa's largest dedicated research institute, it concentrates on crucial development areas in the social sciences and humanities (HSRC, 2021) and its motto, "Social Science that Makes a Difference", closely fits its vision of becoming an all-round leader in "transformative social science research in the interests of a just and equal society" (HSRC, 2021). The HSRC focusses on producing and using targeted knowledge in support of eradicating poverty, reducing inequalities and promoting employment, being a trusted and engaged research partner to scientific communities and civil society, and guiding government towards informed policy-making (HSRC, 2021). HSRC research is primarily publicly funded and valued as a public good. The organisation's staff consists predominantly of researchers, but includes support staff.

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 external review and the HSRC's need for a researcher-supporting e-research strategy.

This study assesses the eRKC's current research support services offered to HSRC researchers towards their research objectives. The researcher set out to evaluate whether current eRKC are supportive of researchers in successfully producing quality research products, and if not, what changes or additional quality services could add impact to the research support and, in turn, aid researchers in purposefully and positively impacting lives in South African society.

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's 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. Further, it contributes to research excellence and supports the drive towards research impact. The unit focusses on augmenting the HSRC’s data with big data to respond to Sustainable Development Goals; the needs of research communities using its research output; harnessing technology to increase research use and uptake and identifying which spatial statistical techniques can assist in responding to National Development Priorities and Sustainable Development Goals.

Its vision is to enhance the HSRC’s research capability through innovative information services, geospatial solutions and digital scholarship services (formerly digital curation) (HSRC, 2018).

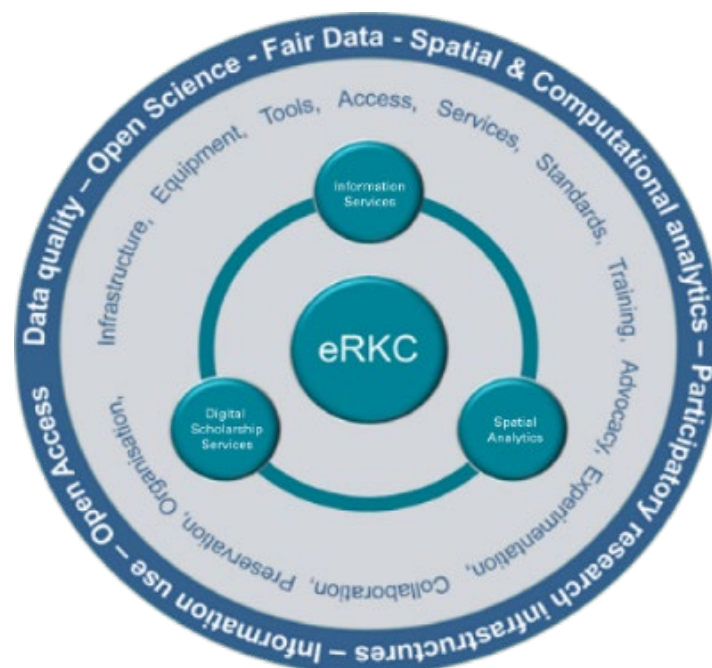


Figure 1: The research focus of the eResearch Knowledge Centre (2021)

At a time when researchers are being asked to work more collaboratively, with more interdisciplinarity, and with greater compliance with the demands of funders and governments, e-research addresses the challenges they face. Currently, HSRC researchers engage in e-research by using digital tools and technologies to facilitate good research practice. Responding to their research demands will require substantial coordinated effort from the eRKC to work with the research divisions and other support services in new ways to ensure that the products of research are well managed, readily

findable and, preferably, available in open access, while also recognising ethical and privacy issues.

The primary objective of this study was to investigate the experiences and insights of HSRC research staff into current eRKC services as regards to achieving their research targets and goals. The findings will be incorporated into the HSRC's e-research strategy, currently under development. Opportunities for updated and/or new services to ensure the unit's relevance and continued research support are also revealed.

A multi-method approach was adopted for this assessment (see Section 1.8), providing insight into the value of current eRKC research support practices, identifying possible additional services, and adding to the knowledge about the role of libraries in South Africa in enabling research. Other science councils and similar research organisations also stand to benefit from the outcomes of this study.

1.2 Defining e-research within the research community

According to Applebe and Bannon (2007:83), the term e-research (in reference to the shift from paper-based to digital research) dates from the year 2000. The review of e-research literature did not turn up a definitive definition for e-research and neither 'e-research' nor 'e-science' could be found in the Oxford English dictionary.

Borgman (2007:20) defines e-research as synonymous with cyberinfrastructure and as "technologies to facilitate distributed, collaborative, information-intensive forms of research and learning". Meyer and Schroeder (2008) stress that e-research is "only one part of the more recent internet-enabled scholarly communication system".

'E-science' also seems to be used synonymously with 'e-research'. Jankowski (2007:550) wrote that some European countries, such as the Netherlands, prefer to use the term e-research, which "is seen as more reflective of the work of both social scientists and scholars in the humanities". According to Whitmire (2013:69) e-science is "research involving immense datasets that require large-scale computing resources to facilitate analyses".

In the LIS context, citing the Association of Research Libraries (ARL) (2013), Whitmire (2013:69) describes e-research as "computationally intensive, large-scale, networked and collaborative forms of research and scholarship across all disciplines" (Association of

Research Libraries, 2013). Previous ARL reports describe 'e-science' similarly to 'e-research' – confusing when deciding which term to use. Libraries use the term 'e-research' much more loosely and, according to Whitmire (2013:69), it is applied much more widely than the ARL definition intended. Whitmire (2013:70) argues that e-scientists use 'e-science' and librarians use 'e-research'. For this study, Meyer and Schroeder's (2008) definition of e-research, "the use of digital tools and data for the distributed and collaborative production of knowledge", was adopted.

Martin (2014:3) characterises e-research as an enhancement to the research process, rather than trying to replace or compete with traditional research practices. The role of research, including e-research, has therefore not changed, the focus remaining on knowledge creation and dissemination. The difference lies not in what is happening during the research process, but rather in how the research process is conducted, communicated and preserved (Martin, 2014:3).

As regards the social sciences, a report by Berman and Brady (2005) expressed an aspirational vision of social sciences e-research potential for the near future. Dutton and Meyer (2008) state that, despite noteworthy innovations arising from information and communication technologies, e-research uptake has been slow in the social sciences, with social scientists "lack[ing] awareness of initiatives and innovations in this area". Meyer and Schroeder (2008) also considered the somewhat slow understanding of online research within the social sciences. Dutton and Meyer (2008) found that more exposure to e-research and training programmes could be effective in creating awareness for younger social science researchers who seem to be more interested in the e-social research environment. Genoni, Merrick and Willson (2009:93) include the types of informal communication and community-related practices found particularly within the humanities that, traditionally, did not have to rely on big data sets or all-embracing computational services. A study by Denison, Kethers and McPhee (2007:1) found a noticeable need for services in data management, and for new and improved technology and tools to support e-research and research data preservation.

1.3 The role of libraries in providing e-research support

Creating and growing this new digital scholarship in the e-research environment has become a significant part of what libraries are about today. Libraries are changing in how

they can support research. Raju, Raju and Johnson (2016:168) explain that the demand for new services to support research arises from changes in education and increased access to information and that the library's role has had to be redefined and re-evaluated. Devan (2020) notes that the library's role has evolved from delivering high-quality scholarly collections and resources meeting researcher requirements, to playing a bigger role in developing research staff skills and capabilities. Libraries are more focussed 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 the emphasis on digital content and establishing modern physical and virtual research spaces (Martin, 2014:98).

Kennan, Williamson and Johanson (2012:57) agree, stating that the upswing of e-research moved libraries' focus from activities, like depositing, preserving and storing, to new ways to fulfil researchers' needs and new roles for librarians in research data management.

Heidorn's (2011:670) study on the emerging role of libraries in data curation and e-sciences found libraries to have the skill set, longevity and most of the infrastructure to support the e-researcher needs.

McAlpine and McIntosh (2015:9), in creating an integrated model to support e-research at the University of Wollongong in Sydney, Australia, also used the research life cycle as their research theory. They found that many staff members already provided support to researchers within the research life cycle and concluded that libraries must remain aware of local context and take advantage of existing resources and relationships if they are to support e-research effectively. The challenge for research libraries is seizing opportunities to ensure a dedicated e-research service and infrastructure (McAlpine & McIntosh (2015:13).

While libraries aim to retain their identity as a place and as a provider of research support services, becoming a research collaborator within the scholarly communication community has forced librarians to re-evaluate their traditional roles and extend their skills into the digital spheres (Martin, 2014:98). Librarians becoming data librarians, mirroring the changes in their milieu, while moving into a space where they collaborate directly with

researchers, impacts their skills, according to Brown, Wolski and Richardson (2015:232) who found that formal skills remained important, but that informal training, mentoring and support networks were critical, with a need to scope the skills and expertise within teams and in the organisation at large. They also deemed in-depth knowledge of the research process within the organisation critical when librarians move into the research support practice.

A 2013 skills and competency study by the Association of Research Libraries (ARL), the Canadian Association of Research Libraries (CARL), the Association of European Research Libraries (LIBER), and the Confederation of Open Access Repositories (COAR) found that new roles for librarians are imminent in Research Data Management (RDM), Scholarly Communication and Open Access, and Digital Humanities (Schmidt, Calarco, Kuchma & Shearer, 2016:5-8).

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, 2016:10).

1.4 Background: HSRC's Library and eResearch Knowledge Centre (eRKC)

The HSRC and the HSRC library both date from 1968. Subsequently, the library has changed its name many times. At the inception of the eRKC, the library was officially named Library and Information Services (LIS). The library houses 155 000 print books, 55 000 electronic journals and a historically valuable research outputs collection in an award-winning architectural space at the HSRC's head office in Pretoria. Traditional library services – acquisitions, cataloguing and classification, interlibrary loans, circulation, desk research, storage and preservation of the various print and electronic collections – are facilitated by LIS (now Information Services) staff. HSRC staff have all-year access to globally sourced products and services via the Virtual Library (an online library platform). LIS also provides training workshops to inform researchers of the products and services on offer and their effective use. The more traditional library services have long been a support leg for HSRC research.

The Research Management Data Centre (RMDC) programme arose from recommendations in previous organisational reviews and was recognised as an essential programme in 2013. As a “cross-cutting” programme, it provided services to all HSRC research programmes. After five years, in 2017, the RMDC’s work was again reviewed in the context of the HSRC’s overall strategic objectives and against its own self-evaluation assessment prepared for the review (RMDC, 2017). The review found that the HSRC had taken a major step forward in establishing this unit with the purpose of “providing professional support and advice in the critical areas of research methodology, fieldwork, data collection, data processing, data curation and metadata generation, data preservation, statistical data analysis and modelling, as well as the spatial representation of data” (HSRC, 2017:2). The unit’s work was found to have been essential to achieving the HSRC’s organisational goals, with major successes attained since its inception. For the HSRC to be able to do research that no other research organisation can do, the RMDC had to be strengthened considerably to fulfil its mandate (HSRC, 2017:1), thus the amalgamation with LIS already mentioned.

The previously separate units now developed a shared mission and vision, along with shared research goals, developing innovations and forging strategic collaborations, especially in the context of ICT and computing.

1.5 The eRKC’s current research support services

The eRKC is a partner in the research endeavour through embedded knowledge services that contribute to the realisation of the strategic research goals of the HSRC. The unit contributes to research excellence and supports the drive towards research impact.

1.5.1 Information Services (IS)

The IS unit empowers its users to source reliable, accurate and relevant information, data and facts. It supports literature and information retrieval, trains staff (at workshops) to use the wide range of information resources available, sources specific documents as needed, requests information resources through Interlibrary Loans from other libraries, nationally and internationally, 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.

1.5.2 Geospatial Analytics (GA)

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

1.5.3 Digital Scholarship Services (DSS)

The DSS unit curates the HSRC’s research output, which includes data and research publications. The unit preserves, shares, promotes and monitors the use and impact of the HSRC’s 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 where to publish to avoid potentially fake publishers, assisting researchers with copyright matters related to the data or research publications, compilation and reviewing of Data Management and Sharing Plans. The unit also participates in the South African curation community.

1.6 The intended benefits of the eRKC support services

Table 1 details the benefits that the eRKC intends to confer through its support services.

Research enabling strategies	eResearch Strategies	Examples of eResearch activities
Create an enabling research environment	<ul style="list-style-type: none"> • Embed e-research support activities in research divisions • Support research innovation and productivity 	<ul style="list-style-type: none"> • Establish a process of continuous improvement of service delivery • Deliver efficiencies across e-research activities

Provide end-to-end research process support	Provide a set of integrated services to support the research process	<ul style="list-style-type: none"> • Facilitate access to information and knowledge in the social sciences and humanities through the provision of services and resources • Share information with the social sciences and humanities communities both inside and outside the HSRC
Support internationalised research in a technology-intensive environment	Facilitate access to appropriate ICT infrastructure and support	<ul style="list-style-type: none"> • Provide a trusted eResource base, computing, data storage, data analytics, connectivity, equipment and software and enable collaboration across networks
Increase the visibility of the HSRC's research	Facilitate research data management and eScholarship	<ul style="list-style-type: none"> • Preserve, provide access to and promote the HSRC's intellectual output (data and publications)
Care for the intellectual output of the organisation and increase the impact of our research	Preserve, share and promote research output	<ul style="list-style-type: none"> • Provide platforms to share and engage with audiences around research data and insights • Promote the use of data and publications
Support engaged scholarship	Raise awareness and build e-research capacity	<ul style="list-style-type: none"> • Create and deliver opportunities for developing e-research capabilities
Harness innovation in ICT in support of social science and humanities research	Develop and establish approaches, methods and capacity in the use of new research information and data resources, and innovative data intensive research	<ul style="list-style-type: none"> • Initiate and participate in research projects using new data sources and innovative data-intensive research methods such as machine learning, artificial intelligence, and predictive analysis

Table 1: Intended benefits of the eRKC support offering. (Adapted from the 2019 eRKC Strategic Plan).

1.7 Problem statement

Within the HSRC, researchers have always had full 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 (HSRC, 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 and from it, the eResearch Knowledge Centre (eRKC) was born. The recipe saw staff from both units thrown unceremoniously together and then having to work seamlessly and effectively as a team, their different qualifications and backgrounds, and the widely divergent services to be delivered to the HSRC’s researchers, notwithstanding.

Moving from a more traditional research practice into the new e-research environment would require additional services and support for researchers and their already 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 is successfully supporting HSRC researchers.

The study investigated whether the eRKC-provided research support services align with researchers’ requirements.

1.8 Objectives of the study

While HSRC researchers already use digital tools and technologies – such as audio/video recordings, online surveys, mobile devices to capture questionnaire data, websites, the Virtual Library platform, visualisation tools, GIS services and the HSRC Research Output Repository to facilitate good research practice – this study intended to prove the positive value of the current eRKC services, which could then be expanded, upgraded, or improved to better enable the production and dissemination of high-quality research products within the digital environment.

Uniquely, the eRKC combines specialised digital scholarship and geospatial analytics with more traditional library functions. The decision to have a dedicated geospatial unit seems to have been opportune, as these data-related services are now a growing trend (Kallaher & Gamble, 2017:559). Most traditional libraries cannot provide these services, or must secure them, at great cost, to support e-research practices. The GA team contributes

extensively to research projects, often playing a crucial role in the success of research undertaken in the HSRC. The DSS unit ensures high quality data curation for re-use, ensuring that data sets used are authoritative and readily accessible. The data curation practices are well developed.

Despite many successes, continued, purposeful effort is required to develop the unit further, implying a need for systematic assessment to determine the unit's fitness for purpose. Since 2018, the eRKC has focused on establishing the newly created joint unit and on research support services in line with the goals of enhancing HSRC research capability (HSRC, 2018:3), all of which will enhance the HSRC's research.

Despite no hard evidence supporting this new HSRC model, the eRKC staff are subjectively aware of the unit's strengths and any gaps in its services. This study is therefore motivated by the need for objective reflection on areas requiring the most attention and for an evidence-based approach to provide both excellent research support and contribute to the e-research strategy development within the HSRC.

The main aim of the study was to assess whether current eRKC research support practices align with researchers' requirements in achieving their research objectives. The objectives of the study are:

1. To assess the current eRKC research support services and to determine which are adequate, and which are not, in supporting the HSRC researchers.
2. To determine which additional services, if any, the eRKC will need to implement to be able to effectively support the HSRC researchers.

The researcher gained clarity and insight into the extent and value of these services as experienced by HSRC staff. Understanding user experiences and opinions of current eRKC services provides valuable strategic direction for eRKC management and for future strategic decisions for inclusion in the HSRC's e-research Strategy.

1.9 Research questions

A research question aims, through a research study or project, to address the problem identified. According to Mattick, Johnston and de la Croix (2018:104) addressing the issue

or problem in a research question often leads to new insights through the analysis and interpretation of the data collected.

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

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

1.10 Significance of the study

The eRKC plays a critical role in assisting researchers to fully benefit from opportunities in the networked environment. However, the possibility exists that the eRKC is under-equipped to support the needed change. The user perspective of the current services will provide new insights into this critical role to better enable research in the organisation. An understanding of the value of current eRKC services, as well as knowledge of the services needing upgrading or new additions, will provide valuable direction for eRKC management in terms of support of research activities. Determining the need for new or improved services will lead to stronger collaboration with researchers and the re-focusing of the eRKC's services to promote and exploit research practices.

1.11 Research methodology

Research methodology refers to the steps the researcher adopts in solving a research problem systematically. The information needed for each step during the research process is grouped in one place (Kumar, 2014:20). The research methodology used for this study is outlined below.

1.11.1 Multi-method approach

A multi-method approach was adopted. Multi-methods are "based on a methodological research strategy that includes more than one method of collecting data and or more than one method of analysing the data. Such methods can be based on qualitative techniques, quantitative techniques, or a mix of both" (Mills, Durepos & Wiebe, 2010). The study accommodated a quantitative technique, using a questionnaire administered to HSRC research staff, and a qualitative technique in the form of interviews with eRKC staff

members, to assess whether the current eRKC support services align with HSRC researcher requirements.

The researcher believes that the multi-methods approach provided more comprehensive, more nuanced findings. The reasons behind choosing multi-methods are explained in more detail in section 3.5.

An online questionnaire was used to survey the HSRC research staff (Appendix A). Interviews were conducted with the eRKC staff (Appendix B). The interviews were conducted concurrently with the administration of the questionnaire.

1.11.2 Population

The population was chosen through a census to include 156 HSRC research staff members. The nine eRKC staff members were purposively chosen. The sample population is explained in more detail in section 3.5.

1.11.3 Data collection

For the quantitative part of this study, the data was collected by means of an electronic questionnaire. Interviews were done as part of the qualitative study.

1.11.3.1 Questionnaires

The researcher used the free version of Google Forms to create and disseminate the questionnaire and employed a mixture of open- and closed-ended questions. It was administered to HSRC research staff with a valid HSRC email address on the distribution date of the questionnaire. The questionnaires are addressed in more detail in section 3.4.1.

1.11.3.2 Interviews

Virtual interviews via the Zoom platform were used to collect data for the qualitative approach of this study and were recorded and anonymised. The interviews are discussed in more detail in section 3.4.2.

1.12 Limitations and delimitations to the study

Price and Murnan (2004:66) refer to a study design or instrument limitation as a “systematic bias that the researcher did not or could not control and which could inappropriately affect the results”. This study is limited to an assessment of the eRKC’s support practices in the

HSRC in Pretoria, South Africa, due to the time and resources needed for a more comprehensive study on HSRC research services, capabilities and capacity.

A further limitation is the questionnaire response rate. A contributing factor might be the dispersal of the respondents across South Africa and their possible unavailability due to fieldwork or Covid-19 challenges. Ample response time was allowed. A well-structured questionnaire ensured that direct, relevant, time-efficient questions were posed. The study also opted for a population census, rather than sampling, to ensure a higher response rate. Follow-up reminders were issued.

In contrast, researchers do have control over a delimitation. A delimitation is “a systematic bias intentionally introduced into the study design or instrument by the researcher” (Price & Murnan, 2004:66). The researcher has delimited the study to the eRKC within the HSRC. The researcher was thorough in her collection of data on this smaller entity in the hope that the results might paint a broader picture of research services in the organisation.

The researcher has a vested interest in the research support services, given her employment in the Digital Scholarship Support unit of the eRKC.

This study is focused on the HSRC and the findings cannot allow for generalisation. However, important trends in supporting research may be revealed and further, wider-scale investigations prompted.

1.13 Thesis structure

This study is divided into five chapters. Chapter 1 (Introduction) introduces the topic and explains its selection for the study. This chapter also presents the problem statement and research goals, the methods employed, and the research limitations. Chapter 2 (Theoretical Framework and Literature Review) takes the form of a critical overview of literature related to this study. The literature review focuses on the role of libraries in providing research support and library services to enable research within organisations. Chapter 3 (Research Methodology) describes the mixed methodology employed and explains the research life cycle as a theoretical framework in terms of the eRKC offerings. Chapter 4 (Empirical Evidence and Discussion) presents, interprets and discusses the results. Chapter 5 details the main results and presents the recommendations and conclusion.

CHAPTER 2

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Introduction

The theoretical framework of a research study is akin to an architectural blueprint. The blueprint is a virtual framework for the building and details floor plans, plumbing, electrical and mechanical systems, according to Grant and Osanloo (2014:12). The theoretical framework is thus a “guide to build and support your study, and also provides the structure to define how you will philosophically, epistemologically, methodologically, and analytically approach the dissertation as a whole” (Grant & Osanloo, 2014:13).

Theoretical frameworks are built on one or more existing theories that have been tested and validated as acceptable in the scholarly literature (Grant & Osanloo, 2014:16). The theoretical framework and the literature review are fundamentally connected.

A literature review is “essential when planning a research project and for placing research findings in context” (Winchester and Salji, 2016:308). To be able to make a valued input one must understand one’s research field landscape. A review of literature on the topic should be informative and, importantly, unbiased towards contradictory arguments or variations in the literature (Winchester & Salji, 2016:308). The literature review forms an integral part of the research process.

Selecting an appropriate theory for this study, and applying it to the unique HSRC environment, ensured the identification and application of theoretical constructs for this study. Reviewing the literature assisted the researcher in clearly understanding the unique concepts and their interconnectedness within the literature and permitted the framework and literature review to develop amicably in support of data collection, results, analysis and providing recommendations.

The theoretical framework is offered first, while the next section discusses related studies delving into the ability of libraries to support research needs. Research enabling or support services during the research life cycle, as discovered in the literature and arranged according to the Prepare, Gather, Create, Share, Preserve and Measure phases of the adopted research life cycle, are then discussed. A summary concludes the chapter.

2.2 Theoretical Framework guiding the study

Selecting an appropriate theoretical framework is an important part of planning the research study. This decision will affect how the selected argument is constructed, will define the context in which the problem is placed, and will provide an explanation for the eventual findings (Grant & Osanloo, 2014:24). The concepts of the theoretical framework are intertwined with the research process to become one with the research study.

In a study examining research support in academic libraries, Raju and Schoombie (2013:28) describe the new role of the library in research as supporting increased research and scholarship productivity. Libraries must seize the opportunities provided by the e-research infrastructure and become coordinators in the research process. In developing a research life cycle model for libraries, Vaughan et al. (2013:312) found that libraries should embrace their new role, tailoring their services within the research life cycle activities by being active partners throughout the process.

Research libraries are guided by their mission statements to meet organisational targets (Heidorn, 2011:662). Chiware and Mathe (2015:3) write that “science has entered a ‘fourth paradigm’ which is more collaborative, more computational and more data-intensive than the previous experimental, theoretical, and computational paradigms”. With pressure on researchers to publish their results, research libraries must support all scholarship and partake in the entire research process (Jaguszewski & Williams, 2013:4). Webb, Gannon-Leary and Bent (2007:2) echo the library’s role of supporting research, through collection management, dissemination of research findings and access to information. The e-environment is increasingly critical for researchers, as are the tools and services supporting the research life cycle process.

Pasipamire (2015:65) notes that scholars differ regarding the stages, components and wording of depictions of the research life cycle. No approach, then, is incorrect, with all describing a similar process. No matter the approach chosen, a defined research life cycle, especially when broken into clear stages, facilitates a proper understanding of the research process (Vaughan et al., 2013:313).

Mamtora (2013:256) describes the research life cycle as having four elements, including idea discovery, funding approval, experimentation and results dissemination. This study engages all four of these elements, though they are named differently here.

The study by Vaughn et al. (2013:312) explained the five stages of the UN-CH life cycle model as including idea development, funding applications, proposal writing, conducting research and disseminating the results. Gessner et al. (2017:534) agreed with Vaughn's 2013 research life cycle model of five stages. This research study looks at all five of Vaughn and Gessner's life cycle stages.

Raju and Schoombee (2013:33) 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). This research life cycle model was interrogated for all six phases through a questionnaire and interviews and the eRKC staff interview framework.

Libraries can structure their services to the various stages of the research process by applying a research life cycle model (Pasipamire, 2015:65). This is supported by Parker (2012:8) who advised academic libraries to inspect their research support practices, using the research life cycle model as a guideline.

For Vaughan et al. (2013:313), employing the research life cycle in libraries facilitates customised services that fit user needs. 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 stage. 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. Vaughan et al. (2013:13) state that the research life cycle facilitates the library's growth and promotion of its services throughout the research process, while remaining engaged in the process. The library thus forms an integral part of research and as a partner throughout the research life cycle. The research process and the services provided are linked. Auckland (2012:16) emphasises understanding the research process when designing suitable services for researchers, as such understanding helps ensure that these services will match researcher needs.

A 2020 study at the University of Cape Town (Dlamini, 2020), adopted the Raju and Schoombee (2013:33) research life cycle as the supporting theoretical framework to

investigate the extent of the University of Eswatini’s library research support services for master’s and doctoral students.

From the literature, scholars agree that the research life cycle model is relevant and suitable to provide a framework to assess researchers’ needs and guide libraries in structuring their support practices according to the research life cycle stages.

This study adopted Raju and Schoombee’s (2013:32) adapted research life cycle model. Figure 2 captures the phases to be used as a theoretical framework to measure eRKC-provided research support practices and determine any additional HSRC researcher support needs.

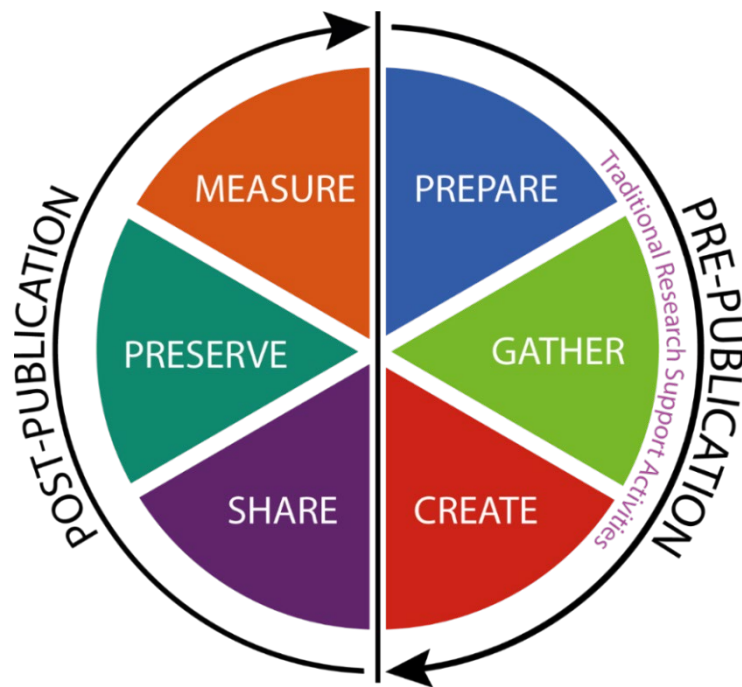


Figure 2: Adapted Research Life Cycle (Stellenbosch University Model of Raju and Schoombee, 2013:33)

For each of the phases in the current study, as detailed below, the researcher administered a survey questionnaire to HSRC research staff (Appendix A) and interviewed eRKC staff (Appendix B) to interrogate the activities identified in the phase concerned for each of the three models discussed.

2.2.1 Prepare Phase

During the “Prepare” phase (ideas and planning), the researcher chooses a topic and composes a research question. Thereafter, the budget is calculated, funding secured, a suitable supervisor/advisor identified, background reading undertaken, workspaces identified, the project plan created, and skills workshops attended (Raju & Schoombee, 2013:33).

The Joint Information Systems Committee (JISC) research life cycle includes a preparatory stage made up of ideas and partners and which is also very similar to the model of Raju and Schoombee (2013). During the preparatory stage, the background or initial literature is collected, a subject competitive analysis is performed, research methods and tools to analyse the data are investigated, training sessions on searching and usage of literature are attended and information on grants and further funding opportunities are collected (Liu, 2017:21-24).

Another research life cycle indicating similar activities to those in the Prepare phase of Raju and Schoombee’s life cycle model (2013) is that of the University of Washington, which refers to activities in the plan/propose stage, resembling those of the Prepare phase. These include the development of the hypothesis or research question, conducting an initial literature search, recruiting the research team, finding research spaces and facilities, writing the proposal and securing funding (University of Washington, 2021).

2.2.2 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 submission for ethics approval takes place (Raju & Schoombee, 2013:33).

The research life cycle employed by the University of Reading characterises the Collect stage as similar to the Gather phase. During this stage, secondary materials are obtained, experiments carried out and surveys undertaken. As with the Gather phase, this stage (Collect) also includes the research methods and the data collection instruments to be able to eventually interpret and re-use the data (University of Reading, 2021).

Wolski and Richardson (2011:1) describe similar activities as part of their four-stage research life cycle, specifically in the Cleansing and Processing stage. Activities, such as experiments, data collection and analysis, and conducting research happens in this stage, which is similar to the Prepare and Collect stages described above.

2.2 3 Create Phase

The “Create” phase sees the researcher undertaking proof-reading, fulfilling copyright requirements and avoiding plagiarism. The referencing and bibliography are completed, along with the initial writing up, editing, analysis and interpretation of results (Raju & Schoombee, 2013:33).

Maxwell (2016:120) describes the Publication cycle, which includes very similar activities to those mentioned in Raju and Schoombee’s (2013) Create phase. During this Publication cycle, the researcher does the initial write-up of results and editing of the final paper or article.

Liu (2017:21) compares the Publishing stage of the Joint Information Systems Committee (JISC) research life cycle to Raju and Schoombee’s (2013) Create phase. This is where the writing-up happens. Interestingly, the analysis of data is not described here, as is the case with the Create phase, but is included in the previous step in the life cycle as part of the Development and Research Phase.

Another research life cycle model, prepared by the University Library System Research Data Management Working Group in 2015, includes similar activities to the Create Phase of Raju and Schoombee (2013) in their Process, Visualise, Analyse stage in which the activities include documenting and recording results, reviewing of work, validating and summarising results and the work-up or write-up of the paper or article (Lyon, Jeng & Mattern, 2017:54). This life cycle model differs as it does not mention anything about copyright or referencing, though this matter is included in Raju and Schoombee’s Create phase, as used for this study.

2.2.4 Share Phase

Included in the “Share” phase are optimising researcher visibility, building research networks, publishing and collaborating with other researchers and sourcing publishing funds (Raju & Schoombee, 2013:33).

In the research life cycle, as adopted by Wolski and Richardson (2011:3), the activities shared by Raju and Schoombee’s (2013) Share phase and that of Wolski and Richardson’s Publishing and Preservation for Re-Use stage also show some resemblance. This stage (Wolski and Richardson’s Publishing and Preservation for Re-Use stage) includes researcher visibility through persistent identifiers, publishing in a repository or data store as well as other open access options. Copyright, access rights and metadata are included here as part of managing the repository. Repository management, as mentioned in this stage is, interestingly enough, not part of the Share phase, but is discussed in the Preserve phase below. Therefore, the Wolski and Richardson research life cycle combines the Share and Preserve stages.

The research life cycle model, adopted by the University of Melbourne, Australia, notes similar activities to the Share phase of Raju and Schoombee (2013) in their Publishing and Sharing stage of the life cycle. This stage includes online user-profiles and engagement to influence success rates and impact in competitive environments. This model also provides guidance on publishing options and the selection of the appropriate journal, as well as encourages open access publishing within the Publishing and Sharing stage, as is the case with the Share phase adopted for this study (University of Melbourne, 2021).

2.2.5 Preserve Phase

“Preserve” includes backing up research conducted, making research output discoverable, archiving outputs and managing/archiving datasets for sharing and future use (Raju & Schoombee, 2013:33).

The Electronic Preservation Cycle, as described by Maxwell (2016:120), includes activities, such as the preservation and dissemination of scholarly output. In this phase, the output is shared via the repository and archived for future use.

Back-ups received no more than a mention in the Raju and Schoombbee model, while long-term preservation of research output did not make an appearance in any of the models investigated.

2.2.6 Measure Phase

“Measure” uses metrics in support of funding applications, demonstrating impact, and deciding where the research should be published (Raju & Schoombbee, 2013:33).

While there are many reasons to measure research impact, there has been no universal agreement on how to do so (ALA, 2019). There is also not currently one single tool or system that completely measures impact. 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.

Mamtora (2013:5), writing about the comprehensive research life cycle adopted by The Queensland University Libraries Office of Cooperation (QULOC) in 2012, explains the Results Dissemination stage as being similar to the Measure phase of Raju and Schoombbee (2013). This stage includes bibliometrics, impact assessment and support for publication – as is the case with the Measure phase. Also interesting is that this Results Dissemination stage includes repository management and open access publishing, as already discussed in the Share phase.

Assessing Research Impact, as the last stage in the research life cycle adopted by Ragon (2017:387), looks at the major activities at play here. This stage does not refer to the funding application support as is noted in the Measure phase, but the activity of grant applications and the value of the library in this process did receive a mention.

2.2.7 Summary of studies

The studies by Vaughn et al. (2013), Mamtora (2013), Lyon, Jeng and Mattern (2017), Gessner et al. (2017), Raju and Schoombbee (2013), Ragon (2017), Liu (2017), Wolski and Richardson (2011), and Maxwell (2015), as well as the Universities of Reading and Washington, all identify similar activities of the research life cycle, even though the stages in which these activities will be included will vary from life cycle to life cycle. The support

roles identified from the studies mentioned are grouped in Figure 3 according to how they will be applied in the six phases of the life cycle model adopted for this study.

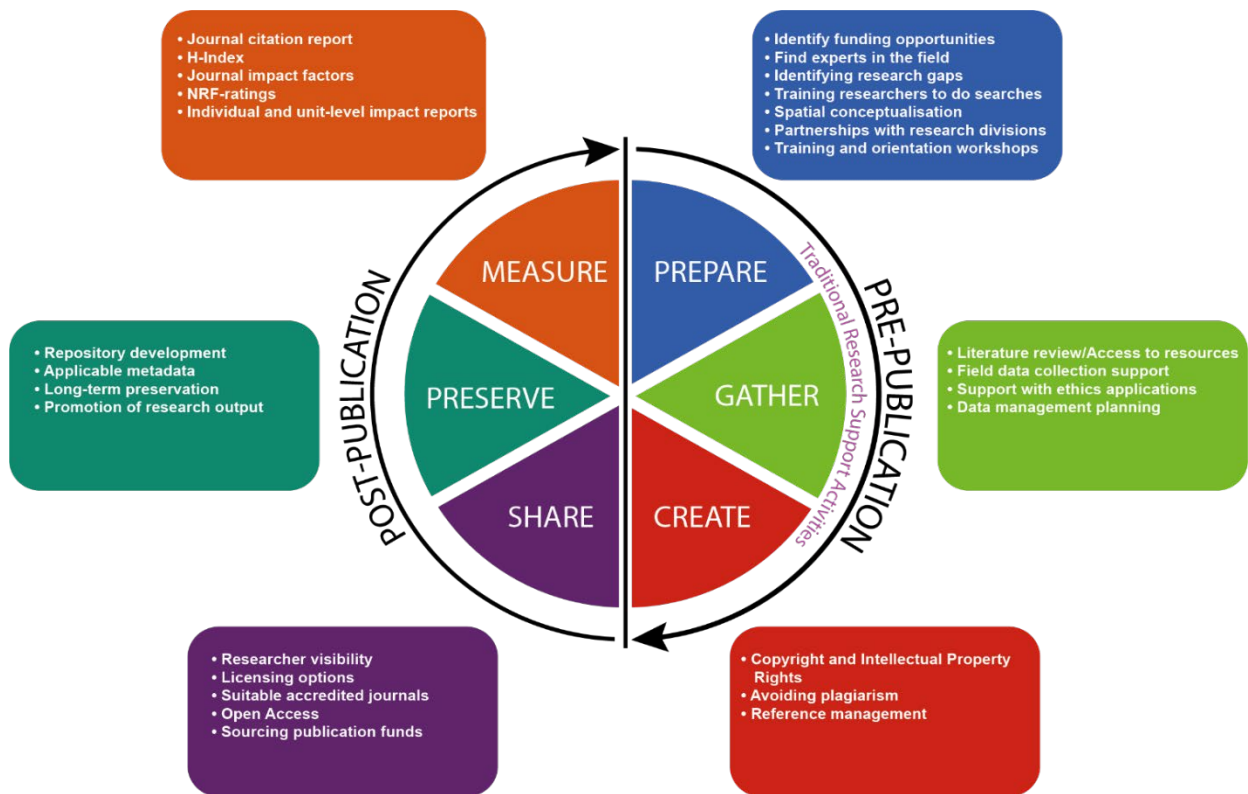


Figure 3: Library support practices in the research life cycle

The phases and activities of the research life cycle formed the basis for the design of the questions, as well as for the structure of the interviews (Appendix B) and the survey questionnaire (Appendix A), thereby providing a framework that allowed all eRKC research support activities to be assigned to a specific stage in the research life cycle.

2.3 Literature review

2.3.1 Related studies on the ability of libraries to support research needs

Although a core library's purpose is to play a supporting role in research (Webb, Ganon-Leary & Bent:2007:2), the library's role has shifted to accommodate the changes brought about by the digital age. The ability of academic and research libraries to support e-research and meet e-researcher's needs is a challenge for all involved. This section will review studies with similar intentions or methodologies to the proposed study.

A study by Mulligan (2016:2) used a survey to collect data on the support of researchers and the research process as collaborators, services and partnerships with other units

outside of the library. The survey, delivered to 124 research libraries, as members of the Association of Research Libraries, elicited 73 responses (59%). Nineteen digital scholarship activities were identified, and participants were asked where they would find support for each of these – whether in the library, elsewhere on campus or outside the organisation. Interestingly, the findings show libraries – to some extent – as supporting all nineteen activities. It was found that activities around database administration, software platforms and technical upkeep continue to fall outside of the library (Mulligan, 2016:3). In addition, “as the research, tools, and methods to produce digital information rapidly evolve and transform, research libraries strive to meet and anticipate the demand for support and collaboration” (Mulligan, 2016:3).

Citing Cohen (2007), Greenhow, Robelia and Hughes (2009:253) write that the main qualities of social scholarship lie in openness, conversation, access, sharing and revision. With new, emerging technologies available, stronger emphasis falls on social knowledge practices within digital scholarship (Markauskaite, 2010:90). Today, digital scholarship includes a range of new products for building digital knowledge bases and expanding scholarly dissemination (Greenhow, Robelia & Hughes, 2009:247). Lynch and Carleton (2009:240) talk about the changing role of research libraries within the four typical research library functions: collection, organising, providing access and archiving. Each of these is changing within the digital sphere.

With the publication of the National Research and Development Strategy in 2002, the library and Information sector anticipated possible new services and activities. In the Page-Shipp et al. (2005:1) study, a literature review, followed by structured interviews, was adopted as a research methodology. Prompted by the study, Page Shipp et al. (2005:2) suggest a minimum of six components necessary to provide supportive services for e-research activities: computation and data transmission infrastructure, research tools and applications, ability and willingness to share data, publishing open access content, and digital curation and preservation, and involvement in innovative new projects.

Denison, Kethers and McPhee (2007:1) note the “significant need for professional data management services and for improved tools capable of supporting the management of e-research and the long-term preservation of research data”.

A report, prepared for the Association for Research libraries by Jaguszewski and Williams (2013:4), interviewed administrators from five research libraries on services that research libraries should or should not offer. The findings described six trends in the way libraries will have to develop to support e-research. These are user-centred library services, emerging specialised functions, rapidly changing user needs, renovated and repurposed spaces and strong technical support, collaboration and partnerships and workforce re-skilling and development (Figure 4).

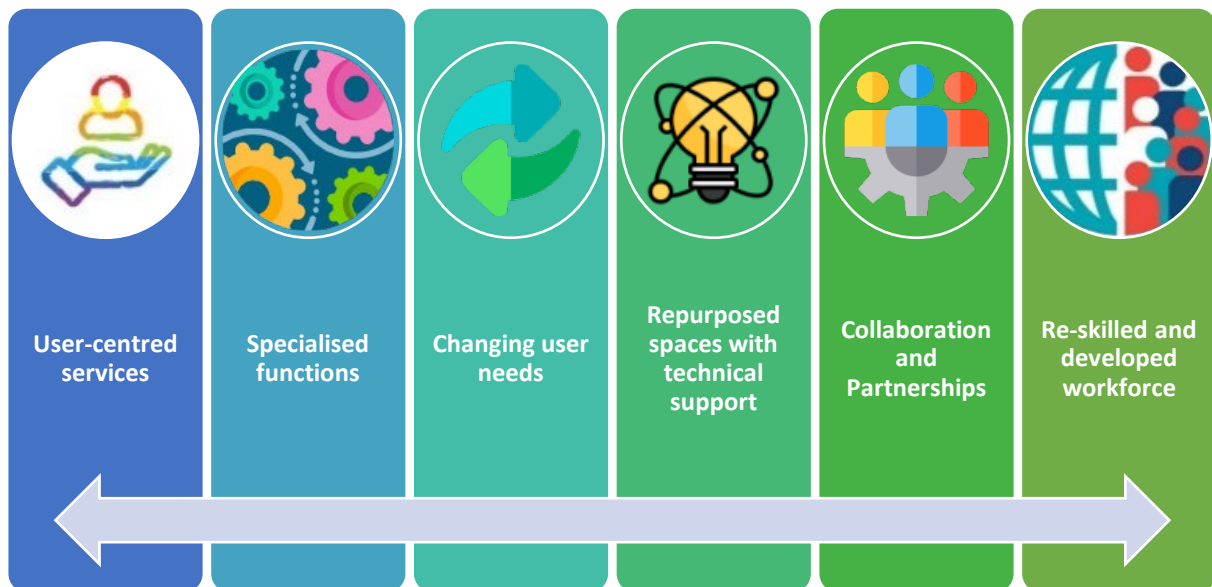


Figure 4: Trends in the services libraries offer to support e-research

The components suggested by Page-Shipp et al. (2005) are complemented by the trends posited by Jaguszewski and Williams (2013:4), with the latter emphasising the human element and describing the skills that are necessary today. Throughout the literature reviewed, the components named by Page-Shipp et al. (2005) and the trends suggested by Jaguszewski and Williams (2013) appear as focus points for most libraries.

Citing Brown and Swan (2007:1), a research study commissioned by the Research Information Network and the Consortium of Research Libraries collected evidence of how researchers and librarians saw library services changing in the future. The study found that research libraries need to plan and provide innovative services to meet researchers' upcoming needs. (Brown & Swan, 2007:8).

An Australian study investigated e-researcher needs and the ability of the Queensland University of Technology (QUT) in providing e-research services (Thomas, 2011:36). While

a case study methodology was adopted, describing the stages of a project to develop the capability of the library to offer e-research services, the model ultimately generated applies very closely to the study proposed for this research study. The study found that e-research activities are increasingly becoming part of academic libraries. Thomas (2011:46) noted that “it is important that services in support of e-research expand simultaneously to guard against problems that may arise such as data loss, mismanagement of copyright and prevention of data re-use”. Funding is an enormous factor in libraries’ ability to attract researchers, increase research quality and build effective services in support of e-research (Thomas, 2011:46).

Since 2011, the libraries of one of the USA’s largest research universities, the University of Minnesota, have been involved in projects exploring the needs of e-researchers through user needs studies. Johnson, Butler & Johnston (2012:2) reported on these studies from 2011, noting that, through collaborative actions, the development of e-services was prioritised. The study further concluded that the efficiency of sharing best practices and resources on e-research through forming cross-institutional relationships is evident and that libraries are well-positioned to build an engaging, knowledgeable group of e-research librarians (Johnson, Butler & Johnston, 2012:8).

The e-Uptake study of 2010, in the United Kingdom, provided valuable proof that Higher Education institutions are adapting their services as regard e-research support. The e-Uptake study interviewed over 50 researchers and more than 50 staff members in higher education environments about their engagement with e-infrastructure. The data collected confirmed the existence of interrelated aspects impacting the implementation of e-research services (Voss et al., 2010:4162). In view of the high-quality data garnered in the cited study, the proposed study will also employ interviews, although on a much smaller scale.

Closer to home, it is encouraging to see the South African research and academic libraries focusing on e-strategies for their institutions, looking at digitisation, promoting open scholarship and e-resources and providing better access platforms in support of e-research (Chiwere & Mathe, 2015:3). Locally, research libraries struggle to (79.2%) implement these new services and roles. For example, Chiwere and Becker’s (2018:1) study on the readiness of southern African academic and research libraries to deliver research data management services, revealed slow southern African uptake, with countries outside South Africa having no such plans for the foreseeable future. Their study recommended

advocacy for research data management and for academic and research libraries to take the lead in this role.

2.3.2 Research enabling/support services during the research life cycle

Research support, according to Raju and Schoombee (2013:29), refers to the librarian being pro-actively 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. (2017:40), 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 a 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.

2.3.2.1 Research enabling/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, 2016:118). 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, 2016:118). Another study, by Atkinson (2016:138), also suggests that libraries should assist in identifying potential funders for research.

In a study by Ragon (2019:386), researchers were asked about their activities and the support they required 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. Riera-Quintero, Padrós-Cuxart and Zuñiga-Ruiz (2012) note that the library's role in information provision is not only that of assisting with a literature review, but also that of identifying leading authors or researchers. Hollister and Schroeder (2015:98) agree that researchers could benefit from greater library support in grant applications.

A study by Liu (2017:22) identified five library support functions during the planning stage of the research life cycle. These include research information provision, a discipline

development service, construction of discipline resources, training researchers in literature searches and building service platforms. Bruxvoort and Fruin (2014:20) agree that libraries should extend their services to include researcher training on how to conduct literature searches. Atkinson (2016:138) further suggested that libraries include support in identifying research gaps for future studies in the preparation phase.

A study done by Kong, Fosmire and Branch (2017:420) suggests that libraries could support GIS (Geographical Information Systems) needs with services related to spatial consultations, providing information around “spatial concepts, available 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, Fosmire & Branch, 2017:420).

For the purposes of this study 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 researchers are assisted by HSRC Legal Services in this regard.

2.3.2.2 Research enabling/support services during the Gather phase

The planning cycle gives rise to a research proposal, either initial or complete (Maxwell, 2016:118). This proposal is then executed during the Gather phase. From Atkinson’s study (2016:138), it is suggested that libraries include support in assisting researchers with proposal writing. University faculties, together with a dedicated writing centre, usually oversee this role. However, there is an opportunity for libraries to connect researchers to statisticians and methodological experts during this phase. Libraries could also offer training in note-taking and tools, such as EverNote, in support of this activity (Atkinson, 2016:138).

In the traditional sense, libraries have always been the custodians of information and the librarian's role has been that of providing this information to the client. Searching for the information included the discovery and acquisition of journal articles, images, data sets and or 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. 2017:538). In a study done by Gabbay and Shoham (2017:724), their results show a consensus among faculty members and librarians regarding the role of the library in providing access to electronic databases and printed books and journals, as more than 92% of respondents from both groups perceived these components to be within the roles of the library with respect to research. Riera-Quintero, Padrós-Cuxart and Zuñiga-Ruiz (2012) agree that, during this phase, the researcher and librarian work together to establish a state-of-the-art bibliography on the topic.

However, this information provision role has changed from the way it has always been. According to Raju and Schoombee (2013:34), 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”. The suggestion is, therefore, to change the library's training workshops to ensure that researchers become more self-sufficient (Raju & Schoombee, 2013:34).

A study by Liu (2017:22) identified library support functions in this phase as that of research data management and data analysis consulting services. Semeler, Pinto and Rozados (2017), cited in Koltay (2019:76), describe research data management as “a comprehensive set of activities for the organisation, storage, access, and preservation of data”. Research data management, therefore, includes services, tools and infrastructure to support research data management across its life cycle. Cox & Tam (2018), as cited by Koltay (2019:76), take note of the usability of life cycle models in research data management because these models “provide a simple and understandable visualisation and to some extent reflect, how researchers themselves perceive research “.

A data management plan (DMP) is a short, written plan at the start of the research project that describes the data that a researcher will collect and generate during the project. It encompasses data creation, data description, data analysis, data storage, data sharing and data preservation of any type (Schiermeier, 2018:403). However, a study done by

Ragon (2019:387) noted 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 the use of such data management plans is supported by many libraries. It is also good to research practice to keep track of the data for comparison in cases where other researchers fail to produce the same results. Any data that serve as evidence for a researcher's claims and results should be archived.

Riera-Quintero, Padrós-Cuxart and Zuñiga-Ruiz (2012) agree that large datasets and extensive notes need to be organised in some way, with appropriate metadata (tags and headings) assigned with the assistance of academic librarians.

Hamad, Al-Fadel and Al-Soub (2019:2) note that data is an "essential part of research that should be managed, preserved, and shared. Researchers should have the ability to collect, analyse, share, and effectively manage and preserve their research data".

Atkinson (2016:138), Raju and Schoombee (2013:28) and Hollister and Schroeder (2015:110) agree that research data management should be one of the new and expanded services provided by the library.

Institutional review boards (IRB) or Ethics committees (EC) play a critical role in research organisations and universities. They act as an ethical and legal manager or overseer of the research project. It is therefore important for the library to build a strong relationship with the IRB or EC in the organisation as this strategic relationship facilitates a view of research projects in the organisation. Access to these projects will allow the library to reach out to clients and provide logistical support during the ethics process (Maxwell, 2016:119).

In the study done by Kong, Fosmire and Branch (2017:420), they note that library services to support GIS (Geographical Information Systems) needs relate to the organisation of data, the collection of field data and the data publication. Setting up a GIS server environment, geodatabase and storage space, in the study concerned, was facilitated through the library (Kong, Fosmire & Branch (2017:420).

For the purposes of this study, 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. It is suggested by Kong, Fosmire and Branch (2017:421) that, instead of a

hands-on approach, training be provided to users to allow them to be more self-sufficient in data analysis. The four services that will be included in this study are listed below:

- Literature review/Access to resources
- Field data collection support
- Support with ethics applications
- Data management planning and metadata support

2.3.2.3 Research enabling/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 findings of the research study. For libraries, strategically speaking, this would be the perfect opportunity to assist with the writing and editing of emerging reports or papers (Maxwell, 2016:120). 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 to host writing workshops as well as training researchers on their intellectual property rights (Maxwell, 2016:120). Atkinson (2016:138) and Bruxvoort and Fruin (2014:20) concur that libraries include their support in carrying out research by advising on copyright matters.

Copyright law influences the way that libraries take shape, with authors and content creators accorded particular monopoly rights to compensate them and promote the production of intellectual works. Libraries and educational institutions depend on the law to maintain power equilibrium among creators, publishers, and users – even more so given that licensing is replacing purchasing (Henderson, 2019). Libraries need to promote institutional repositories for increased visibility, provide advice to authors on intellectual property rights, advocate for open access and balance the rights of authors and users alike (Nilsson, 2016:78).

Reference services have always been one of the core functions of libraries. The automation of bibliographies and the development of 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, 2016:119). This opinion is shared by Nockels (2005:422), who mentions the real contribution made by librarians to promote academic practice, and by teaching researchers about referencing and how to use the referencing tools available. Mitigating the damage caused by plagiarism is a service that librarians can

provide. Without becoming the organisation's copyright police, libraries are perfectly placed to train users in proper citation methods, and the dangers of plagiarising, as well as about whichever of the relevant tools, for example, Turnitin or iThenticate, is available to them (Zimmerman, 2012:297-298).

For the purposes of this study, proofreading is excluded, as this service is not in the mandate of the eRKC and provision thereof is outsourced. The following three services will be included in this study:

- Copyright and Intellectual Property Rights
- Avoiding plagiarism
- Reference management

2.3.2.4 Research enabling/support services during the Share phase

The dissemination or sharing of research results or findings refers to the process of sharing these findings with stakeholders and a wider audience. Sharing research findings is critical for research uptake which, in turn, is important for the success and sustainability of long-term research networks.

It is therefore not surprising that, when asked about activities to disseminate research results, researchers unanimously agreed on publishing in peer-reviewed journals (Ragon, 2019:387). This opinion is shared by Raju and Schoombée (2013:29) in that the librarian will, together with the researcher, identify appropriate journals to publish the results in. The library can also guide other publishing options.

In the study by Ragon (2019:387), researchers were very much aware of funder requirements of open access publishing, but they were more invested in compliance than in their aspirations towards making their work available in open access. Ragon (2019:390) noted that more than 50% of library leaders showed services directed at journal selection for publication and open access, as well as funder public access policy compliance. Raju and Schoombée (2012:29) agree that one of the new and expanded support services that libraries should offer is facilitating open access practices.

Article processing charges (APCs) are used by publishers to fund open access publications. Authors are charged upfront to make the article available in open access at no cost to the reader. Many academic libraries and institutions have established special

funds to carry the costs of these APCs so that authors can get published. According to Reinsfelder and Pike (2018:2), supporting authors with APCs shows the libraries' commitment to supporting the open access movement. However, these APCs are expensive and can usually only cover one article at a time. New publishing initiatives, based on a crowdfunding model, might be the future solution for libraries to share the cost of open access in a much more cost-effective manner than APCs (Reinsfelder and Pike (2018:1). As licensing slowly replaces purchases (ALA, 2019), the role of libraries is to advise researchers on the types of usage licenses for their publications in open access journals (Raju & Schoombee, 2013:30).

Another strategic move, suggested by Maxwell (2016), would be for libraries to move into the publishing space. Being a partner to the organisation's publishing unit or press can result in the library's involvement in the research life cycle from the idea planning stage right through to the final publication of the article, book or chapter (Maxwell, 2016:120).

Creating a researcher identifier and profile is a known method to organise all intellectual output by a specific researcher in one place and acts as a reliable source for individuals and organisations (Kumar, 2020:188). One of the extended services, suggested by Bruxvoort and Fruin (2014:20), is that of the library managing the researchers' scholarly identity through ORCIDs (Open Researcher and Contributor ID). Hollister and Schroeder (2015:110) note that researchers could benefit from library support in intellectual property management and assistance in increasing researchers' visibility and professional status. In the study by Ragon (2019:387), other researcher profile platforms, namely ResearchGate and LinkedIn, were mentioned as ways for them to manage their professional identities. Libraries have a responsibility to educate users about these researcher profiles, show them the advantages and also assist in creating a profile to connect all their publications (Kumar, 2020:192).

For the purposes of this study, four research enabling/support services are 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. The eRKC does, however, foster a good working relationship with the HSRC Press and collaborates with the HSRC Press on various projects.

2.3.2.5 Research enabling/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 re-use. Libraries, in particular, academic libraries, often play a big role in preserving and re-use as they provide the infrastructure to enable these activities. Institutional repositories and other types of software platforms are frequently provided by the library to fulfil this role. Atkinson (2016:138) agrees that libraries should include institutional repositories and data curation as supporting services.

MacColl (2010), as cited by Hamad, Al-Fadel and Al-Soub (2019:5) note that it is critical for libraries to engage in curating, advising and preserving research output. Data curation and preservation services are also suggested by Raju and Schoombee (2013:29) as a critical new service offering. The expertise that the library brings to the data curation processes is critical to securing data sets and making them available. "Datasets are the knowledge backbone of multi-year research projects" (Maxwell, 2016:120).

Of vital importance at this point in the research life cycle is metadata services. Appropriate metadata will maximise the organisation's scholarly output (Maxwell, 2016:120). Librarians are traditionally skilled in the design, selection and application of metadata and these skills would benefit the data curation and sharing process (Shaffer, 2013:11). These metadata management skills will likely be critical in the retrieval and curation activities within research data management (Hamad, Al-Fadel & Al-Soub (2019:5). According to Tenopir et al. (2013:76), academic research librarians are the best qualified to fill the need for research data services, including data management planning, digital curation (selection, preservation, maintenance, and archiving), as well as metadata creation and conversion.

The purpose of preservation is to ensure the protection of 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 short period, the fragility of the files, and technology obsolescence have all proved to be a difficult pill to swallow for librarians whose key function in society is to archive information (ALA, 2019). In the study by Ragon

(2019:390), the majority of library leaders did not indicate that support services related to the long-term preservation of experiment materials and data archiving had been considered for their libraries. Raju and Schoombee (2013:35) also noted that the Stellenbosch university library does not have a long-term preservation policy.

Libraries are continuously looking for ways to maintain and preserve digital information, at reasonable prices, to stay economically sustainable (ALA, 2019). Shaffer (2013:11) also acknowledges the challenges faced in terms of storing data and making it available for analysis and reuse (Shaffer, 2013:11). In terms of geospatial services, the study by Kong, Fosmire and Branch (2017:424) found that libraries should negotiate for more capacity to host geospatial data for future use.

For the purposes of this study, three research enabling/support services are included in the Preserve phase of the current study. These are:

- Research output repository development
- Metadata services
- Long-term preservation
- Promotion of research output

Engagement with the IT unit to facilitate curation processes, storage and dissemination, as well as to mitigate risks of digital information loss, takes continuous effort from the eRKC, but due to engagement being an indirect service to the researchers, it is not included in this study.

2.3.2.6 Research enabling/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 patterns of publication within a given field of literature” Raju & Schoombee (2013:31) and can greatly improve the visibility of research output (Raju & Schoombee, 2013:29). Quantitative methods, such as citation counts, the h-index, and journal impact factors are some of the most-used impact measures in libraries today (Berkeley Library, 2021). In a study by Liu (2017:27), it is noted that citation analysis is necessary for research approvals, as well as to authenticate the ability and level of researchers. The study showed that 33% of interviewees asked for more information on this service to assist them with funding applications. Astrom and Hansson (2013:16) note that a resilient link between the library and the university management can develop, arising

from providing evaluation information through bibliometric analysis and, therefore, becoming part of the funding processes.

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 & Barbrow, 2014:3). Altmetrics, or alternative metrics, refer to newer impact measures that are not meant to replace bibliometrics, but rather complement them by holding reader attention online and ensuring engagement with the material, such as social media and other online content interactions (Berkeley Library, 2021).

Astrom and Hansson (2013:17) note that libraries should take on the role of articulating the benefits of bibliometrics to the organisation, as well as to the research community and that by so doing, they are putting themselves at the very centre of higher learning. Rodgers and Barbrow (2014:6) agree and motivate libraries to become active partners in awareness raising and literacy around new measures of scholarly research.

For the purposes of this study, 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 (Training and orientation workshops on services and tools, referred to on p38).

2.4 Summary

Librarians have a fine understanding of the research life cycle and provide services in support of aspects thereof. However, the complexity here lies in the research processes which are growing ever more idiosyncratic and individual. Technological innovation is here to stay. Libraries and librarians fulfil an essential role in supporting scholarship creation throughout the e-research process. Both are moving towards a tailored approach to and management of research data rather than simple preservation. Libraries are adapting too, driving the wide-scale adoption of digital tools in support of e-research and the management, curation and visualisation of data. This process is not without difficulty with, for example, uptake of research data management in the southern African context remaining slow. Gessner et al., 2017:542) side with Stamatoplos (2009:236) who states

that it is incumbent upon libraries to provide services at multiple points along the research life cycle and who also suggests that such services be customisable. Bringing together a skilled workforce, funding and technology will provide us with the right guidance for the research library of the future (Gessner et al., 2017:543).

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The research plan, tools and methods underpinning this study are presented in this section. Research design is defined as “designing a study and developing a strategy to guide you during the research process” (Neuman, 2014:165).

In the methodology section, the reader is provided with sufficient detail to understand the process of how the researcher intended to find answers to the research questions and how the conclusions were reached (Struwig & Stead, 2013:54).

This study aimed to assess the current eRKC research support practices in support of HSRC research activities. The outline below describes how the researcher planned to gather the necessary data, sample the intended population and analyse the results. The researcher would then set about providing a conclusion to the investigation.

3.2 Research theory

Theory, according to Collins and Stockton (2018:2), refers to the bigger idea that plays the role of organising many other ideas and by doing so provides powerful explanations. Theory, therefore, assists in making sense of the methods that will eventually provide answers to the research questions.

Theory, or theories, used together with the principles or beliefs of the researcher, provide a clear theoretical framework to explain the way forward for how the study will process new information and knowledge (Collins & Stockton, 2018:2). The theoretical framework brings together existing information and ideas regarding the study, the researchers’ outlook, and character as well as analytical research methods in order to bring unity and wisdom to the study (Collins & Stockton, 2018:2).

This study is supported by an established research life cycle model. To Cox and Tam (2018:2), the life cycle metaphor is especially appealing concerning research because it aligns with established thinking on system and workflow design. This implies distinct, logically ordered stages for activities. A structured research life cycle defines a road map, detailing every task and milestone in the research process.

3.3 Research paradigm

The paradigm, according to Kivunja and Kuyini (2017:26) refers to the philosophical orientation of the researcher and is significant in the choice of methodology for a research study. Raju (2019:3) compares a paradigm to that of a reflection structure that explains how things are seen and understood by the researcher.

This study was conducted according to the precepts of the pragmatic research paradigm. This paradigm refers to a worldview that focuses on what works in practice rather than what might be considered absolutely and objectively true or real (Creswell, 2008:10). Pragmatism, as a research paradigm, positions itself in identifying a real-world problem and then solving this problem. The research problem will only be effective if the purposes of the study are achieved. This paradigm is also used by researchers who are more practically minded (Kaushik & Walsh, 2019:1).

The researcher believes that the eRKC provides well-considered services to HSRC staff, but the current study intends to assess their fitness for purpose, which is to enable research. It is further intended to identify gaps that could be filled by additional services, or where existing services could be improved upon. The researcher is not committed to any specific philosophy or reality and applied multi-methods to attract substantial results from the quantitative and qualitative approaches.

3.4 Research approach: multi-methods

For many years, researchers used either qualitative or quantitative methods individually in their research projects. The combining of both qualitative and quantitative methods, however, “expand[s] and strengthen[s] the study’s conclusions”, according to Schoonenboom and Johnson (2017:110). According to Creswell (2008:9) pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as different forms of data collection and analysis.

Thus, questionnaires (quantitative) with HSRC Research staff and interviews with eRKC staff (qualitative) are accommodated within this approach. The researcher’s motivation for deciding to apply multi-methods is best explained by stating the following arguments, as quoted by Creswell (2008:14):

- The insufficiency argument – using quantitative or qualitative methodology individually for this study may be insufficient by itself. Both opinions and views of the research staff (at the receiving end of the services) and the eRKC staff (providing the services) are valuable in this study.
- Multiple viewpoints argument – using both a questionnaire and interviews deliver a wider angle to the study.
- The more-evidence-the-better argument – more evidence is generated by using the combined quantitative and qualitative approaches, leading to a stronger argument for the case.

The researcher selected the multi-methods approach for this study believing that the findings and recommendations would be valid and that the researchers' requirements and the eRKC support practices would be correctly interpreted and understood within the science council space.

3.4.1 Questionnaires

Questionnaires, when “standardised and carefully constructed”, according to Babbie and Roberts (2018:202) can provide descriptive data in the same format from the concerning individuals or groups. The quantitative measurement precisely captures details of the social world in which the study is focussed, and these details are expressed in numbers (Neuman, 2014:203). A questionnaire suggests a collection of questions, but can also include statements to which respondents can agree or disagree (Babbie, 2016:249).

Using a survey questionnaire brings benefits such as cost-effectiveness, generalisability, reliability and versatility to the research. Data collection methods can also have their weaknesses, such as inflexibility and a lack of depth (DeCarlo, 2018:301-302). An advantage of using an online questionnaire is that it is relatively inexpensive to create and administer. For this reason, the researcher chose to collect the quantitative data by creating and disseminating the online questionnaire using the free version of Google Forms. Another advantage of an online questionnaire is the ease of data collection. HSRC research staff are spread over three South African locations. Using the online questionnaire ensured that data collection took place in all three locations. The questionnaire link was emailed to participants, providing anonymity and avoiding

researcher bias (Neuman, 2014:345). Emailed questionnaires, completed at respondents' convenience, provided more favourable response rates. Leedy and Ormrod (2015:175) also note that online software allows for follow-on questions and, without conceding the honesty of the answers, enables respondents to skip questions.

A structured questionnaire with closed-ended questions was used – including an open-ended question to allow participants to share any additional comments not covered by the questions. Although Creswell (2014:38) states that open-ended questions are preferred to allow participants to share their views easily, for this study open-ended questions would have made the questionnaire far too long. The analysis of the open-ended answers was encoded using Microsoft Excel. Closed-ended questions contain certain fixed possible answers, with the respondent choosing the most appropriate of these. Kumar (2014:151) opines that it is good practice to provide an “other/please explain” category to accommodate any response that arises but that is not pre-listed.

In this study, a combination of questions and statements was used to assess the current eRKC services provided in support of the research life cycle, as well as future services that might be helpful to or requested by researchers. A Likert scale was employed to determine how strongly respondents agreed or disagreed with the statements presented.

The data files were extracted as an Excel file from Google forms. From there they were uploaded into Statistical Package for the Social Sciences (SPSS), a package used for statistical analysis.

A great deal of thought, time and effort went into formulating the questionnaires. Both questionnaires were piloted on four colleagues within the eRKC, who all provided constructive feedback. Much of the follow-up involved why certain question types or statements were used, duplication of themes or topics, language used in the questions, reducing ambiguity, having two questions in one statement and general punctuation. The researcher was grateful for the feedback and considered all suggestions in formulating the final questionnaire and interview questions (Appendices A and B).

3.4.2 Interviews

This study employs interviews as part of the qualitative approach. According to Creswell (2014:240), interviews are “intended to elicit views and opinions from the participants”. Interviews are generally used as a method of data collection where two people discuss information through questions and answers. DeCarlo (2018:363) explains that interviews have certain advantages, such as gathering detailed information; following up on questions; anticipating longer explanations, questioning a complex issue or studying decision-making. Through interviews, researchers are able to obtain the ‘full story’ behind the interviewees’ responses, but in some cases, interviews can have their weaknesses as well, such as relying on the accurate responses and descriptions, time constraints and possible emotional tension (DeCarlo, 2018:363).

The researcher chose to use interviews because the topic of research is complex and some questions or aspects within questions warranted further explanation during the interview. The interviews were also chosen to obtain views and opinions of the current eRKC research service as well as views and opinions on researcher requirements in achieving their research goals. Both views and opinions are more effectively gathered during an interview.

The research interview involved the usual norms, expectations and social roles as applied during any other human or social interaction and mutual respect was upheld during all the interviews. The researcher allocated 60 minutes per interview, with some flexibility built-in, if any questions had to be explained or clarified, or if the interviewee needed additional time. The interviews were scheduled and confirmed for a suitable time using Zoom’s scheduling assistant (Appendix F). Upon interview request acceptance, the researcher deleted the appointment so as not to compromise the interviewee's identity.

The researcher obtained permission from interviewees to record the interview, thus preventing information loss and improving attention paid to participants. Interviewees were requested to sign the consent form (Appendix C) before the interview started. The interviews were transcribed using MS Excel. Not all the data were transcribed, and the researcher focussed on relevant concepts while applying sound ethics and discretion during the transcription process. 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. This method is usually guided by a flexible interview

procedure and “supplemented by follow-up questions, probes and comments” (DeJonckheere & Vaughn, 2019:1). The researcher was able to gather open-ended data and delve deeper into responses needing further clarification.

The research life cycle was incorporated into questions designed to guide the interview, thus helping determine the views and opinions in respect of eRKC services. The data obtained was coded using Excel. Frequency relationships between the various responses were highlighted and, using Excel, the mutual themes were identified as per the research life cycle phases and used for recommendations.

3.5 Population and sample size

The population refers to those targeted to participate in a study. The HSRC’s research staff component is small and therefore a census of the population was adopted for the questionnaire to ensure the maximum response rate. As an alternative to limiting the population to a small sample, data can be collected using a census based on all the relevant cases in the set concerned (Babbie & Roberts, 2018:148). The census approach ensures that every population section is addressed. Only staff with valid HSRC email addresses were approached. One-hundred percent of the respondents were HSRC research staff, with 9% junior researchers, 19% master’s and PhD interns and 56% senior researchers (Table 2).

HSRC Research Staff	Census Totals	Relative Frequency
Division Heads and Directors of research divisions	25	16%
Researchers and technical researchers	102	65%
Interns (Masters and PHDs)	29	19%
Total	156	100%

Table 2: Population and sampling figures for the quantitative data collection
 Purposive sampling was chosen to interview the eRKC staff for the qualitative data collection. According to Leedy and Ormrod (2015:183) “in purposive sampling, people or other units are chosen, as the name implies, for a particular purpose”. From Table 3, 100% of the respondents

were eRKC staff, with three representatives (33.3%) for each of the three subunits within the eRKC.

eRKC Staff Members	Purposive sampling for personal interviews	Relative Frequency
Staff within Information Services (IS)	3	33,333%
Staff within Digital Scholarship Services (DSS)	3	33,333%
Staff within Spatial Analytics (GA)	3	33,333%
Total	9	100%

Table 3: Population and sampling figures for the qualitative data collection.

3.6 Analysis of data

Analysis of the quantitative data was undertaken using the Statistical Package for Social Sciences (SPSS) software, with respondent frequency counts being determined for every question. After data coding, the data were grouped into themes. The interview data were analysed, using NVivo, according to themes identified in the research questions and aligned with the theory behind the study. This is supported by Leedy & Ormrod (2015:310) who state that “the first step in the meaning-making process is to identify a list of potentially helpful ways of categorizing 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.

3.7 Reliability and validity

“Reliability and validity are ideas that help to establish the truthfulness, credibility, or believability of findings”, writes Neuman (2014:212). Both are central to desirable measurement results and researchers strive toward reliable and valid study outcomes.

3.7.1 Validity

Validity, according to Heale and Twycross (2015:66), is defined as the “extent to which a concept is accurately measured in a quantitative study”. Content validity is about whether the questionnaire adequately covers the content for the intended variable; construct validity is about whether conclusions can be formed with the test results and criterion validity is when there are data collection instruments available in other studies that measure the same variable (Heale & Twycross, 2015:66). For this study, validity was improved by reviewing similar studies done on library support practices that enable e-research. The content and the data collection instruments were drawn from similar studies by Brown and Swan (2007); Chiware and Mathe (2015); Chiware and Becker (2018); Tenopir et al. (2014); Thomas (2011); Raju, Raju and Johnson (2016); and Anduvare (2019) and then applied to this study. This study used a questionnaire as the quantitative approach. Interviews were chosen as the qualitative approach. Careful consideration of the structure and questions for both methods was applied. The results drawn from the quantitative data collected were correlated and compared with the data drawn from the interviews, which ensured concurrent validity before conclusions were drawn.

7.2 Reliability

Reliability needs consideration throughout data collection. Reliability refers to the accuracy of the data collection instrument. Heale and Twycross (2015:66) describe the accuracy of the instrument as the extent of consistency in the results when re-applied to the same situation. One area of concern in terms of reliability is researcher subjectivity. To counteract this, the researcher opted to use a more objective quantitative questionnaire. Questions were precisely and unambiguously phrased to prevent unreliable and divergent results. The selected respondents for both data collection approaches were chosen because of their familiarity with and knowledge of the research process and support services. Data collection was applied consistently through careful planning and ensuring that each step was the same for every respondent. Conditions for the data collection were kept as constant as possible and external influences minimised, especially during the interviews.

3.8 Ethical considerations

Ethical considerations are an integral and critical part of any research project. This study considered ethical compliance in terms of institutional approval, informed consent and confidentiality and anonymity.

3.8.1 Institutional approval

The researcher complied with ethics requirements, pursuing approval from the University of Cape Town (Appendix D) and the HSRC (Appendix E).

3.8.2 Informed consent

“In every discipline, it is considered unethical to collect information without the knowledge of participants, and their expressed willingness and informed consent” (Kumar, 2014:285). Participants gave their consent as part of the online questionnaire. This informed consent acknowledged the protection of participants’ rights during data collection (Appendix A).

Participants in the personal interviews were informed of how they were selected and that participation in the interview was voluntary. An informed consent form (Appendix C) was administered by the researcher prior to the start of the interviews.

3.8.3 Confidentiality and anonymity

Questionnaires included a cover letter introducing the study and describing its nature and determination, and how the resulting data would be used. The letter assured data confidentiality and anonymity, with personal information neither required nor shared. It clarified that participation in the study was voluntary and that participants were free to withdraw at any time.

Participants in the interviews were informed that the interview would be recorded for data retrieval during the analysis and that the audio transcript would be anonymised.

3.9 Summary

This chapter has outlined the research approach and methods used in this study and presented the pragmatic research paradigm underpinning it. A multi-method approach was adopted, consisting of quantitative and qualitative data collection designs. Purposive sampling was used to select the 156 HSRC research staff and nine eRKC staff members

as the units of analysis. A survey questionnaire for the quantitative data and semi-structured interviews for the qualitative data were adopted. The quantitative data analysis was done using SPSS, while the interview data were analysed using Excel. The data were aligned with the six phases of the research life cycle, which is the theory behind the study. The ethical research requirements of the University of Cape Town and the HSRC were adhered to. The results are presented in the next chapter.

CHAPTER 4

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This study attempted to assess the current eRKC research support practices and investigate whether these services align with HSRC researchers' requirements in achieving their research objectives. The rationale behind this study was to obtain a better understanding of the needs of the HSRC researchers and to evaluate whether current eRKC services are supporting HSRC researchers.

The study used quantitative and qualitative data collection methods. For the quantitative part of the study, online questionnaires were distributed to every member of HSRC research staff with a valid email address, across all four of the HSRC offices. Qualitative data were obtained through individual interviews with selected eRKC staff members. The data obtained from the questionnaires and interviews were used to address both of the study objectives, namely:

1. To assess the current eRKC research support services and to determine which are adequate, and which are not, in supporting the HSRC researchers.
2. To determine which additional services, if any, the eRKC will need to implement to be able to effectively support the HSRC researchers.

Data obtained from the questionnaires were used to analyse the current eRKC services and to determine any gaps in the eRKC support offerings. Interview data were used to analyse possible differences and similarities between what researchers regard as their support needs (along with their level of satisfaction with the services provided) and what the eRKC staff regard as the researchers' important support needs (along with their perception of the level of service the eRKC currently provides).

The data from both data collection methods were used to answer the research questions:

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

The study design and the structure of the data collection instruments – questionnaire and interviews – were guided by the research life cycle as the conceptual framework.

This chapter reports on the data obtained – questionnaires and interviews – from participants in this study.

4.2 Quantitative results: questionnaire

This section will report the results of the data obtained through the online questionnaire sent to HSRC research staff. The results presentation order reflects the construction of the questionnaires. The outcomes for each of the questions and sub-questions are supported by a figure detailing participant responses. The data obtained are visually summarised per the research life cycle phase at the end of the quantitative results.

4.2.1 Structure of the questionnaire

The structure and design of the questionnaire were guided by the six research life cycle phases, as adopted for this study. The different phases were broken down into sub-categories referring to relevant activities within the research life cycle phases. A detailed presentation of the sub-categories is listed from 4.2.4 onwards.

Participation in the questionnaire was voluntary and participants were allowed to choose not to answer certain questions, as well as to submit their responses even if the questionnaire was not entirely completed (Appendix A).

4.2.2 Population and response rate

A list of HSRC research staff was obtained through the HSRC's Research Management System (RMS). This list included all HSRC research staff in the employ of the HSRC at the time of data collection and based in all four HSRC offices – Pretoria, Cape Town, Durban and Sweetwaters. The final list included 156 research staff who met the criteria for this study.

The online questionnaire was distributed via internal electronic mail on Tuesday, 15 March 2022 to all 156 research staff identified for the current study. Reminders were sent on 22 March 2022, 29 March 2022, 5 April 2022 and 11 April 2022 and a final plea for responses was sent on 14 April 2022. The questionnaire was closed on Sunday 24 April 2022. Fifty-three responses were recorded, resulting in a 34% response rate.

The reason for the low response rate (34% – or only one-third of the identified research population) is unknown and one would have liked to have had a higher response rate. However, research indicates that response rates for survey questionnaires are typically low. Future field study recruitment may be enhanced by using pre-issued cash incentives and sending follow-up waves, which could maximize the representativeness and number of people to recruit (Smith et al., 2019). This may be an effective future strategy.

4.2.3 Biographical information of the respondents

The first section of the online questionnaire collected the biographical details of each respondent.

4.2.3.1 Respondent’s current job title/rank held at the HSRC

Figure 5 shows that 20.8% held the current job title/rank of Senior Research Specialists, while Interns accounted for 9,4% and Executives for 7,5%.



Figure 5: Current Job Titles/Rank of respondents

4.2.3.2 Respondents’ highest academic qualification obtained

The majority of respondents (54.7%) held doctoral degrees, followed by 41,5% who held master’s degrees. Only 3,8% fell into the postgraduate or honours degree level category. Interestingly, no respondents (0.0%) held only an undergraduate qualification (Figure 6).

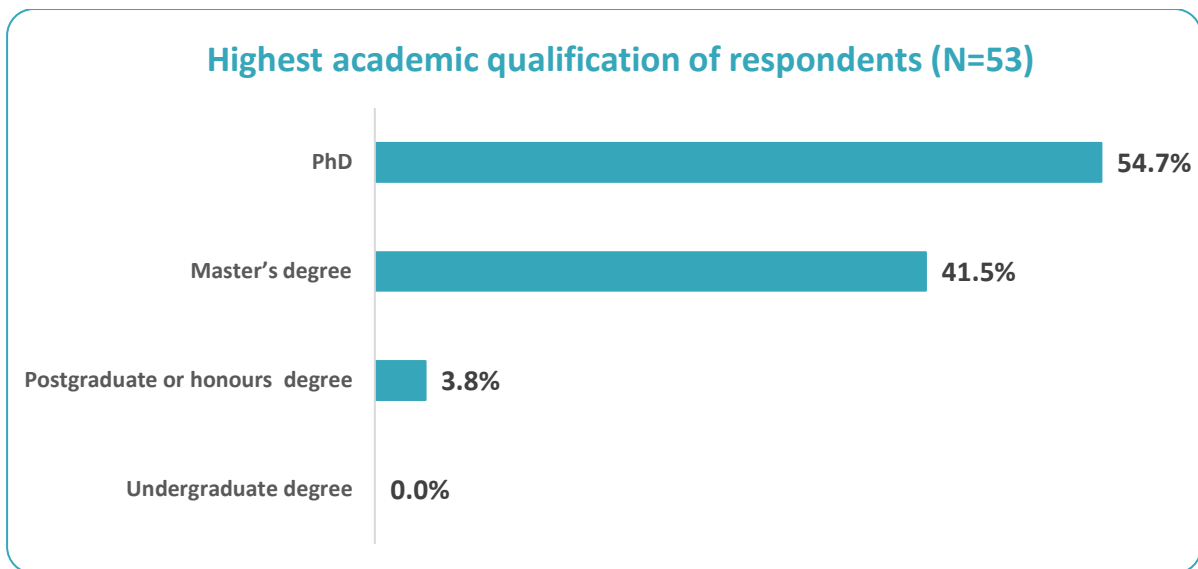


Figure 6: Highest academic qualification of respondents

4.2.3.3 Respondents' length of employment at the HSRC

A large number of respondents have been with the HSRC for six years or more (67.4%). Respondents who had worked at the HSRC for less than two years represented 18.9% (Figure 7).

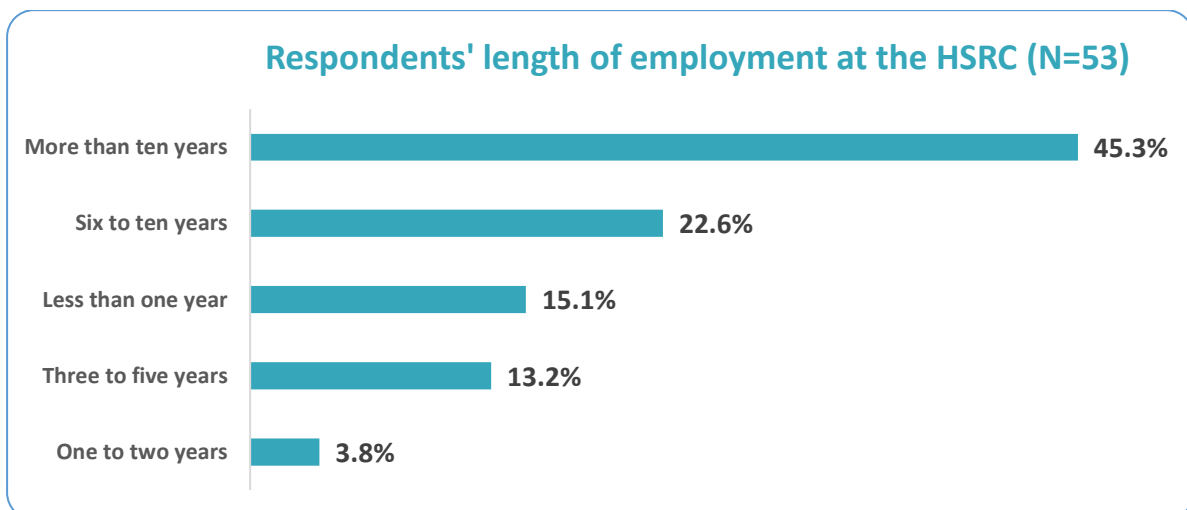


Figure 7: Respondents' length of employment at the HSRC

4.2.3.4 Respondents' assigned office location

Figure 8 shows that 47,2% were based at the HSRC's Cape Town office. Respondents from the Pretoria office accounted for 26,4%, followed, closely by Durban at 20,8%. The Sweetwaters office represented 5,6% of the responses.

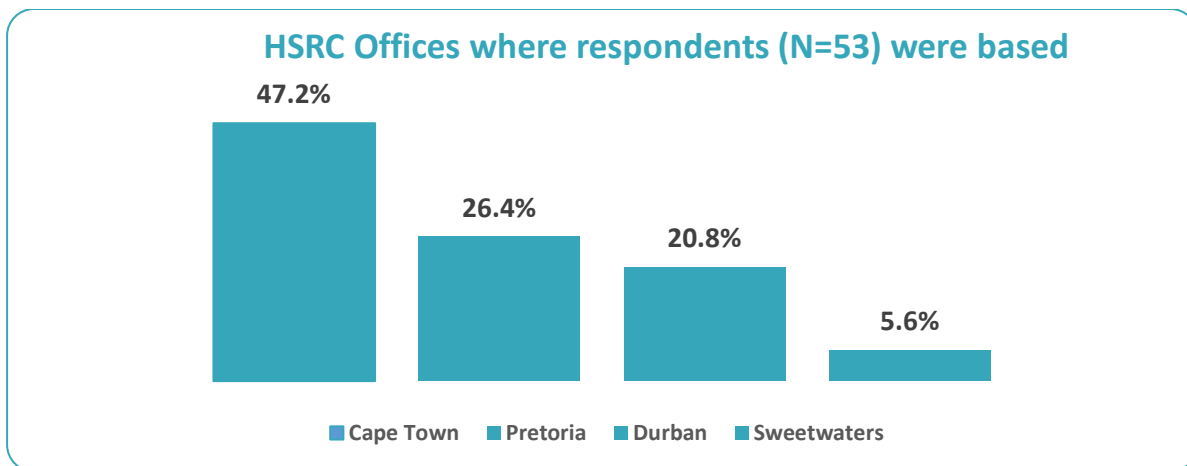


Figure 8: HSRC offices where respondents were based

Although the Pretoria office is the head office of the HSRC, the Cape Town and Pretoria offices host research staff at 64 and 59 respectively. The reasons behind the higher Cape Town response rate could be attributed to higher volumes of project-related activities in the Pretoria office at the time the questionnaire was sent out.

Figure 9 shows the difference in the staff complement employed in the different offices, versus the response rate per office.

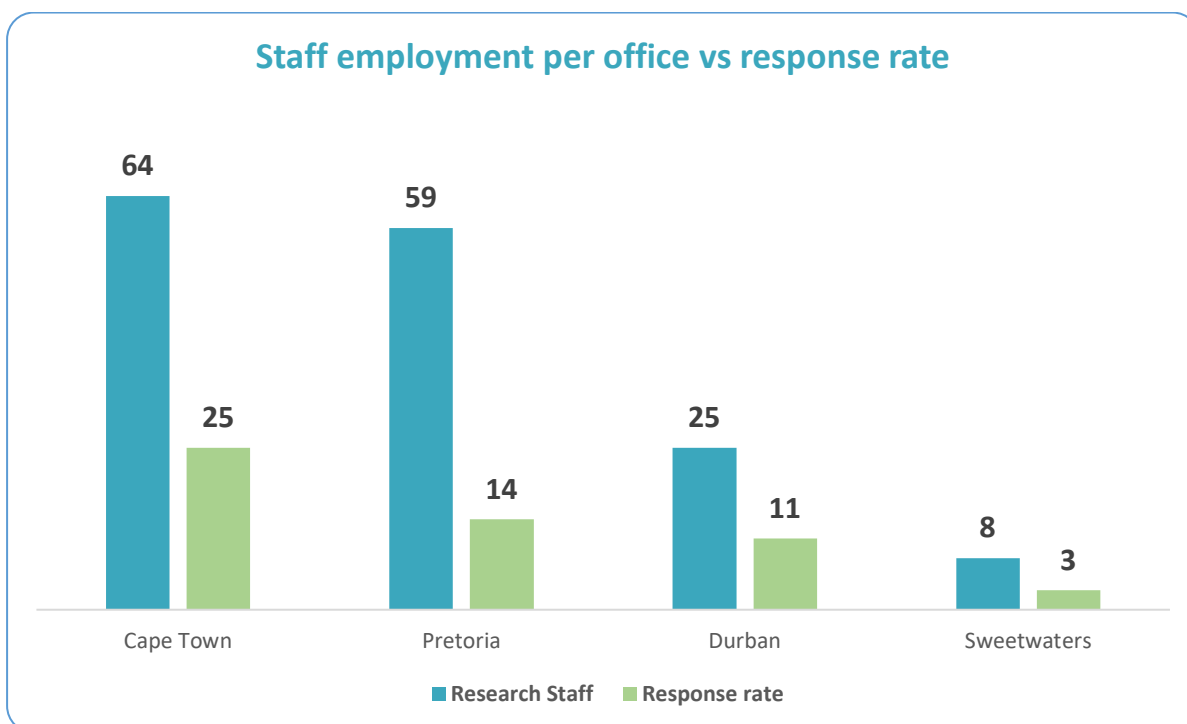


Figure 9: Staff employment per office vs response rate

4.2.4 Research enabling services during the Prepare phase of the research life cycle

4.2.4.1 Environmental scanning

Respondents (N=53) were requested to rate the importance of environmental scanning to their work. Of the respondents, 50.9% found this service to be important or very important (39.6%). None felt that this service was not important (Figure 10).

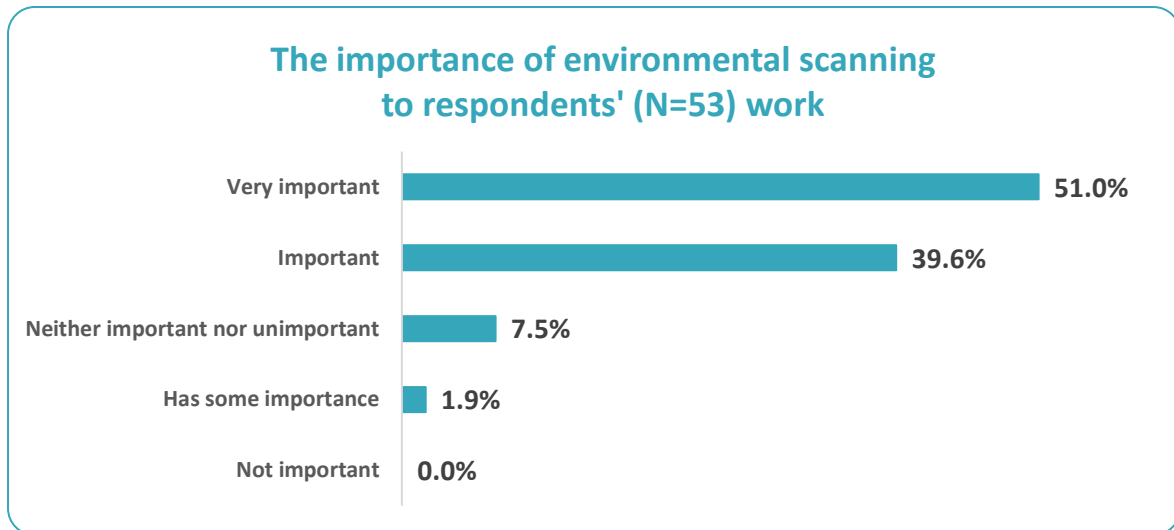


Figure 10: The importance of environmental scanning to respondents' work

Respondents were asked if they used or had considered using environmental scanning services. Of the respondents (N=53), 22.6% had used the service regularly and 39.6% had used it sporadically. None indicated that they would not use this service (Figure 11).

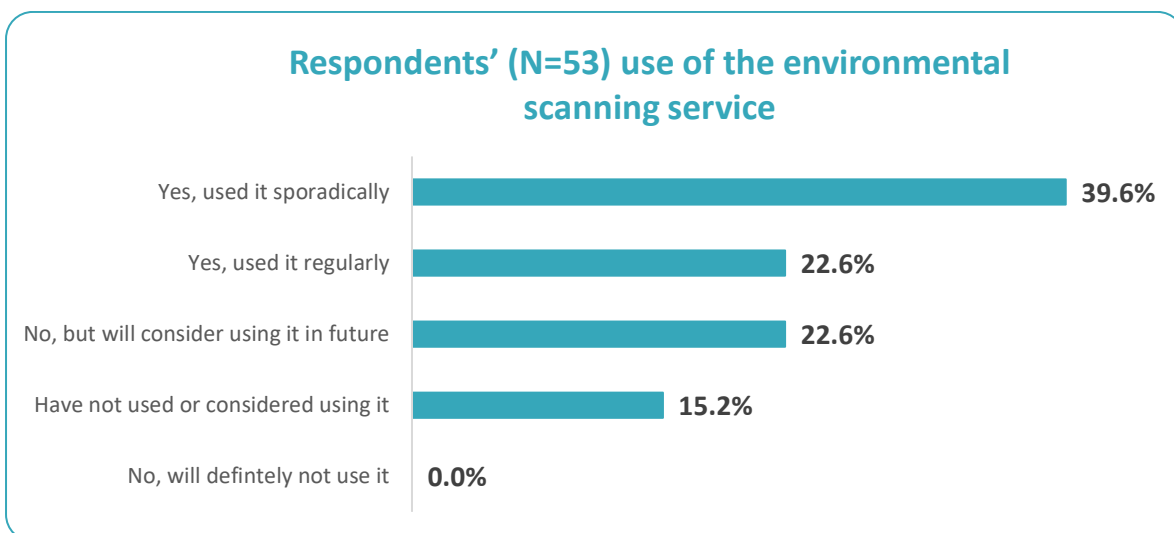


Figure 11: Respondents' use of the environmental scanning service

Respondents were asked if, in general, they were satisfied with this service. Of the respondents (N=33). 60.7% were satisfied. One respondent (3%) indicated a dissatisfied response. None of the respondents indicated that they were dissatisfied with the service, which is a positive outcome that the eRKC might wish to take note of (Figure 12).

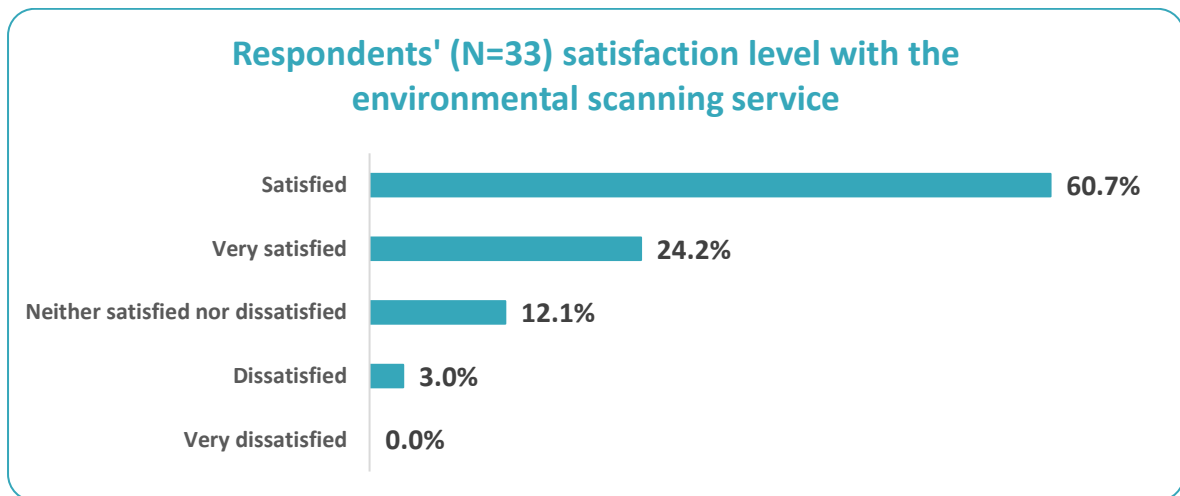


Figure 12: Respondents' satisfaction level with the environmental scanning service

4.2.4.2 Spatial consultation and conceptualisation on research topics

Respondents were requested to rate the importance of this service to their work. Of the respondents (N=53), 32.1% believed this service to be very important, while 41.5% believed it to be important. Only four (7.5%) respondents believed it had some importance (Figure 13).

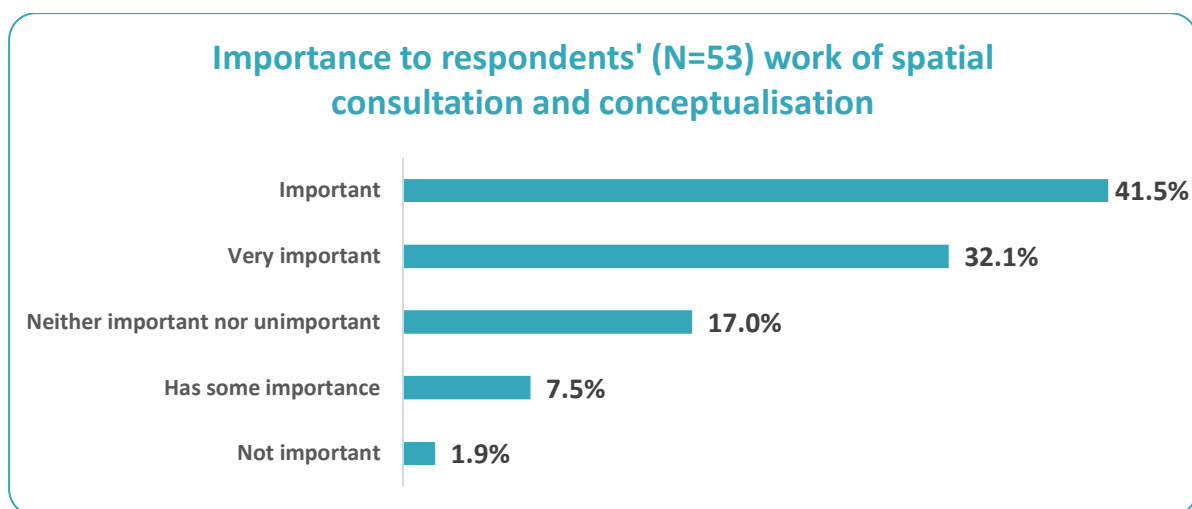


Figure 13: Importance to respondents' work of spatial consultation and conceptualisation

Respondents were asked if they had used or considered using this service. Of the respondents (N=32), 13.2% indicated that they used this service regularly, while 22.6% indicated that they had not used this service, but would consider using it in the future (Figure 14).

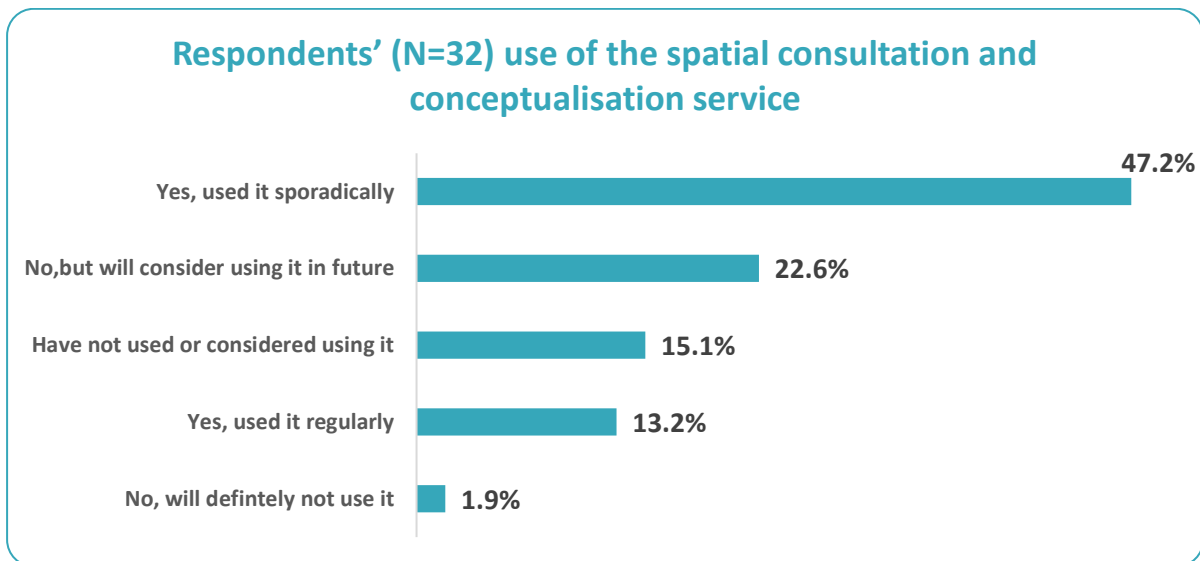


Figure 14: Respondents' use of the spatial consultation and conceptualisation service

Respondents were asked if, in general, they were satisfied with this service. Thirty-two respondents answered this question. Figure 15 shows that 10 respondents (31.3%) were very satisfied. No respondents were dissatisfied or very dissatisfied with this service, a positive outcome that the eRKC might wish to take note of.

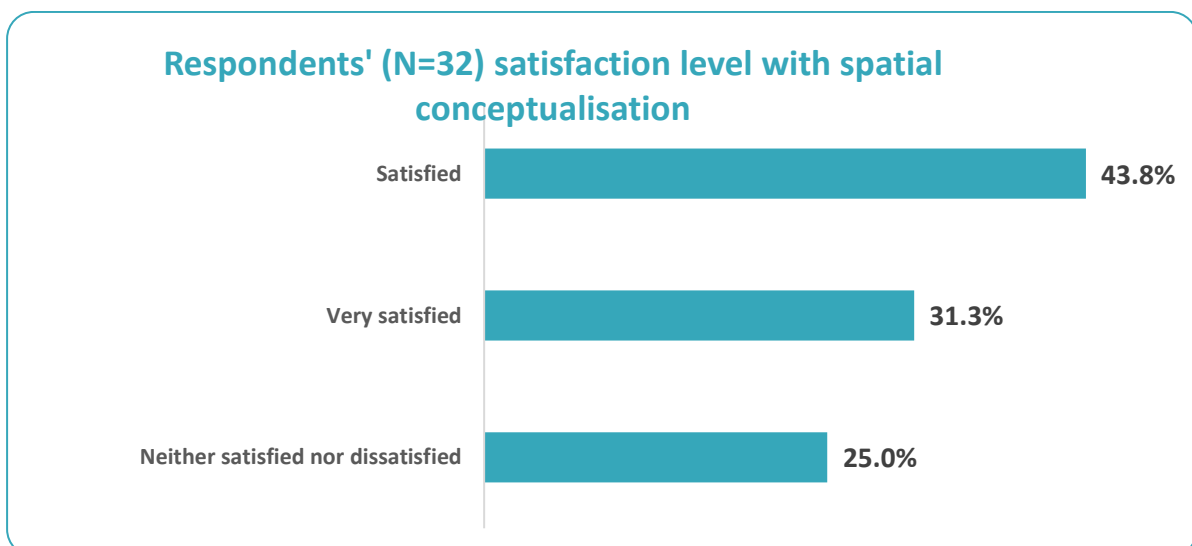


Figure 15: Respondents' satisfaction level with the spatial conceptualisation service

4.2.4.3 Identifying research funding opportunities

Respondents were asked to rate the importance of this service to their work. Of the respondents (N=52), 67.9% believed this service to be very important to their work. Of note are the responses received in terms of the 'neither important nor unimportant' (3.8%), 'has some importance' (3.8%) and 'not important' (3.8%) measures (Figure 16).

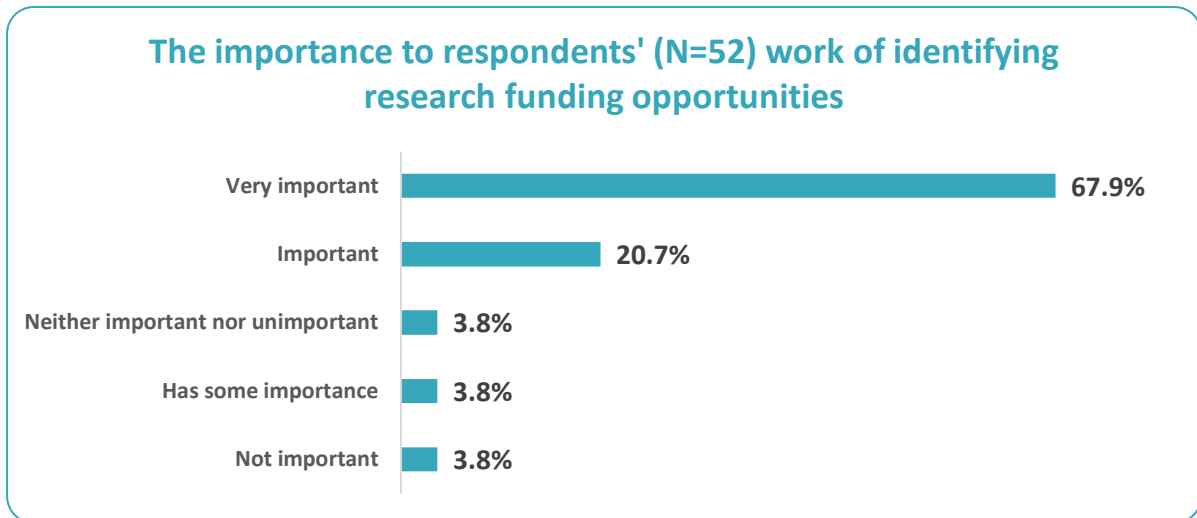


Figure 16: The importance of respondents' work in identifying research funding opportunities

Respondents were asked if they used or had considered using this service. Fifty-two responses to this question were received. Fourteen (26.9%) respondents indicated that they used this service regularly, while sixteen (30.8%) used this service sporadically (Figure 17).

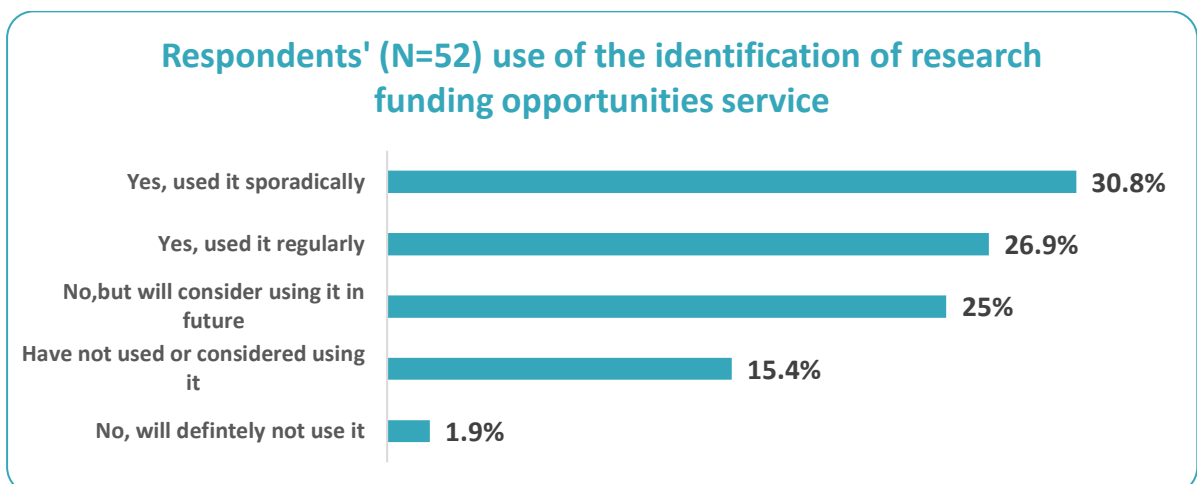


Figure 17: Respondents' use of the identification of research funding opportunities service

Respondents (N=31) were asked if, in general, they were satisfied with this service. Thirty-one respondents answered this question and 19.4% indicated that they were very satisfied with the service, while none of the respondents indicated being “very dissatisfied” – a positive outcome of which the eRKC might wish to take note (Figure 18).

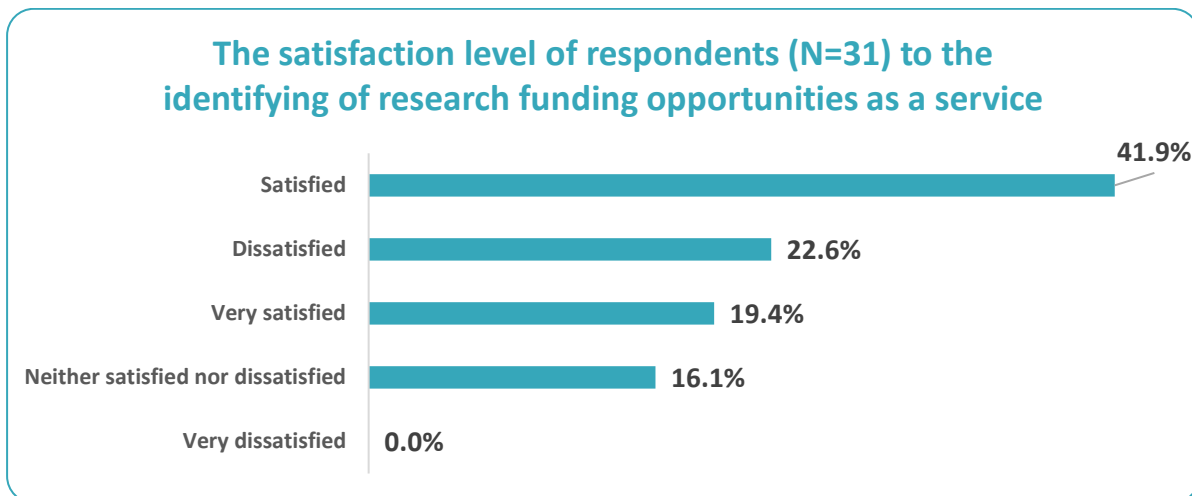


Figure 18: The satisfaction level of respondents to the identifying of research funding opportunities as a service

4.2.4.4 Partnerships between the eRKC and research divisions

Respondents were asked to rate the importance of these partnerships to their work. Of the 52 respondents, 50% believed that such partnerships were very important to their work. None of the respondents reported that these partnerships were not important (Figure 19).

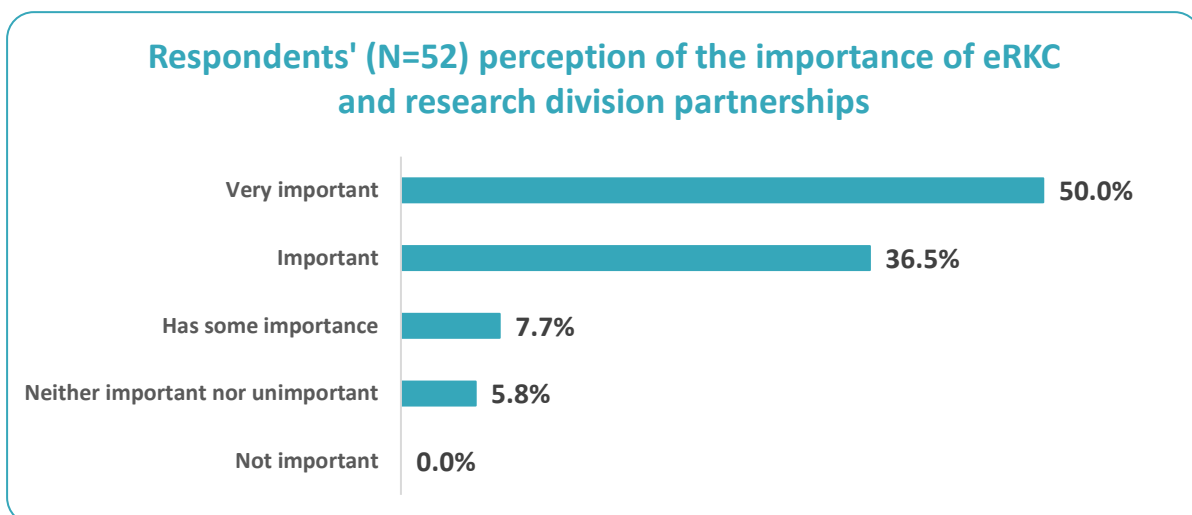


Figure 19: Respondents’ perception of the importance of eRKC and research division partnerships

4.2.4.5 Success of partnerships

Of the respondents (N=46), 13% believed these partnerships to be very successful and 37% believed them to be successful. Of note is the fact that ten respondents (21.7%) believed these partnerships to be somewhat successful, a response that could indicate a less positive experience in the past (Figure 20).

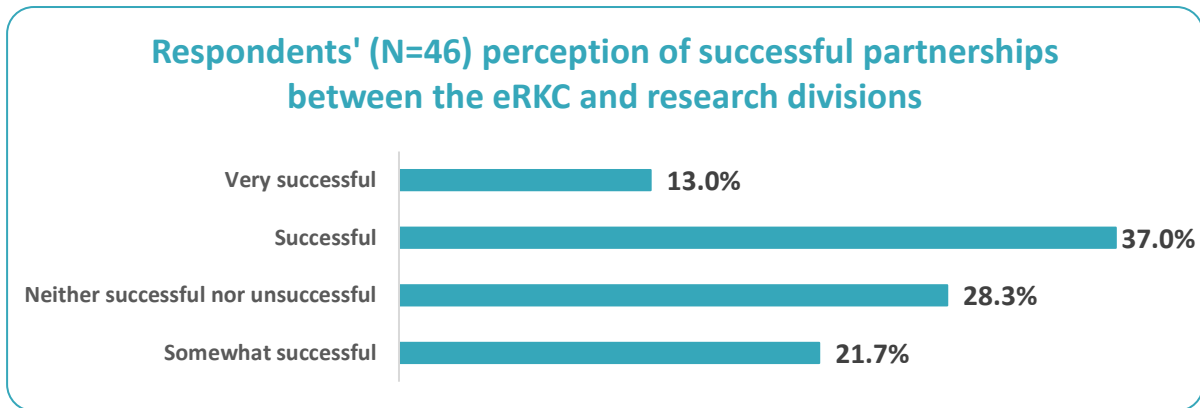


Figure 20: Respondents' perception of successful partnerships between the eRKC and research divisions

4.2.4.6 Training and orientation workshops on services and tools provided by the eRKC

Respondents were asked to rate the importance of these workshops. Of the respondents (N=53), 45.3% believed that attending such workshops was very important to their work. Two (2.8%) believed these workshops to have only some importance (Figure 21).

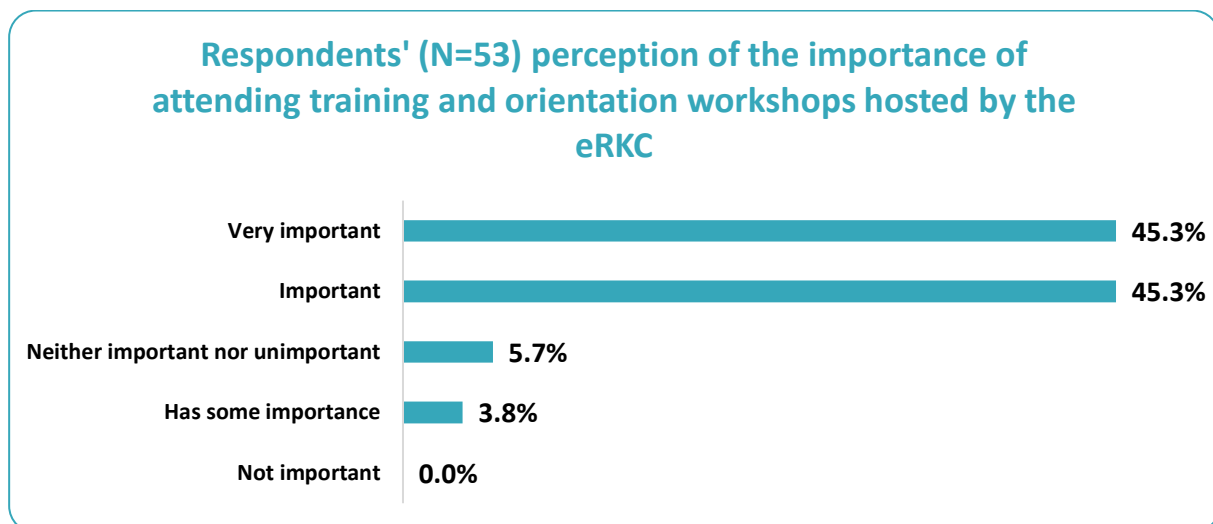


Figure 21: Respondents' perception of the importance of attending training and orientation workshops hosted by the eRKC

Respondents (N=53) were asked if they had previously attended or considered attending eRKC training workshops. Of the respondents, 71.7% had previously attended these workshops. This high attendance percentage could indicate that this service is well received and that the eRKC can be proud of what they have achieved so far. Of the respondents, 22.6% had not yet attended these workshops, but indicated that they would consider attending in the future. Non-attendance might be a result of the Covid-19 pandemic, during which fewer workshops were hosted by the eRKC. Also, a few respondents indicated that they had been with the organisation for less than two years, which might also explain their “not attended” response due to the eRKC’s having placed a lower priority on hosting these workshops due to the pandemic (Figure 22).

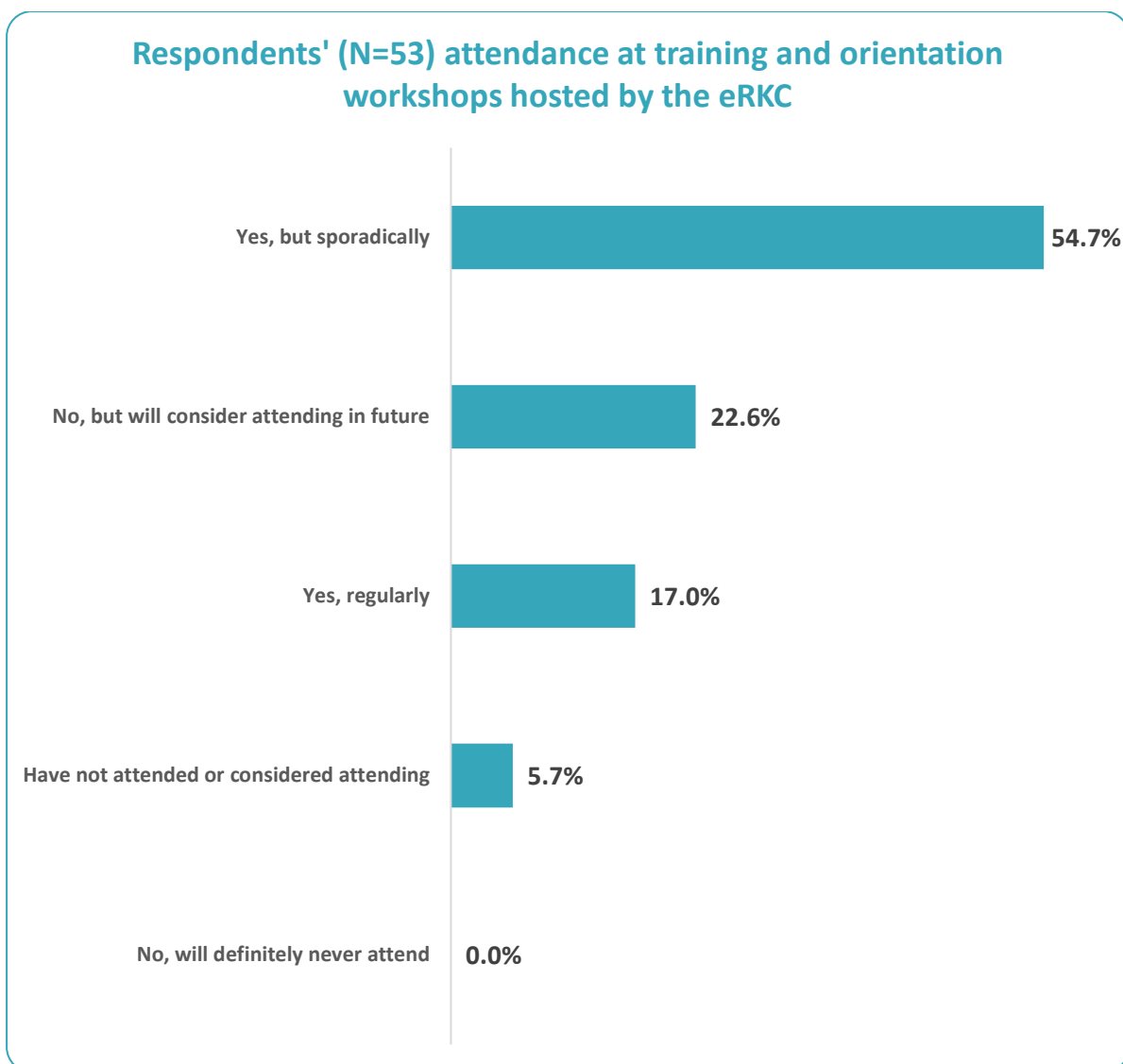


Figure 22: Respondents' attendance at training and orientation workshops hosted by the eRKC

4.2.4.7 Value attached by respondents to training on geospatial analytics in the research process

Of the respondents (N=33), 60.6% characterised the value gained by attending a workshop on geospatial analytics in the research process as moderately valuable. The results are reflected in Figure 23.

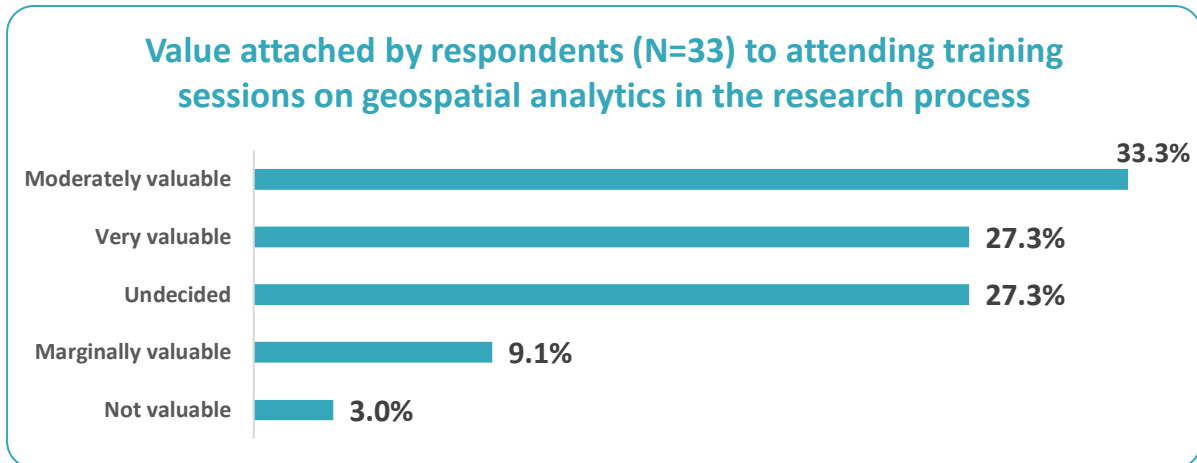


Figure 23: Value attached by respondents to attending training sessions on geospatial analytics in the research process

4.2.4.8 Value attached by respondents to training on exploring survey data using open-source GIS

Of the respondents (N=32), 21.9% indicated that they found these workshops to be very valuable, while 37.5% were undecided as to their value. This might indicate that there is room for improvement in the planning and presentation thereof (Figure 24).

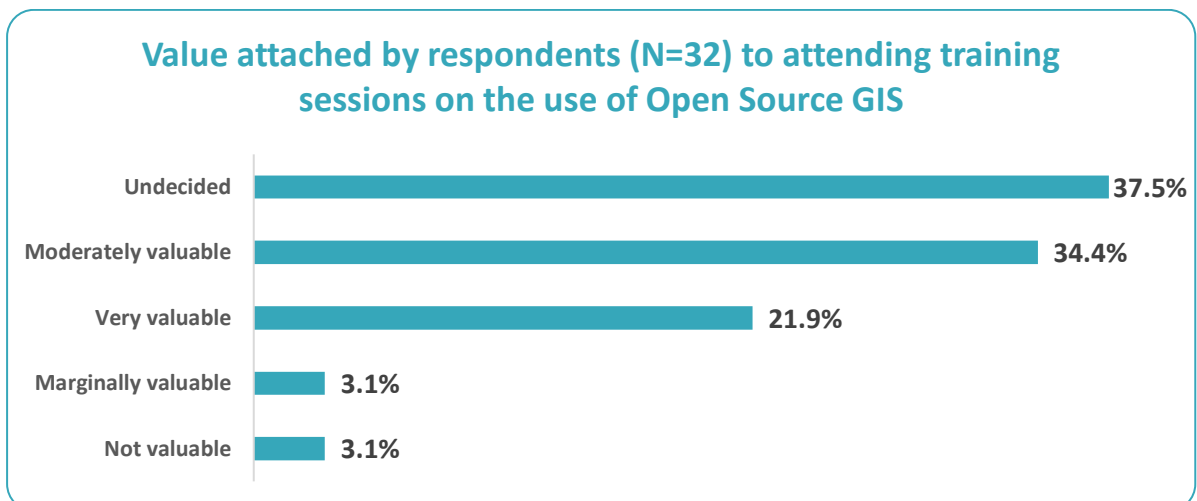


Figure 24: Value attached by respondents to attending training sessions on the use of Open Source GIS

4.2.4.9 Value attached by respondents to training on navigating the virtual library and WorldShare

Of the respondents (N=36) answering this question, 44.4% indicated that they found these workshops to be very valuable. No respondents indicated that this workshop was of no value and the eRKC might wish to take note of this result (Figure 25).

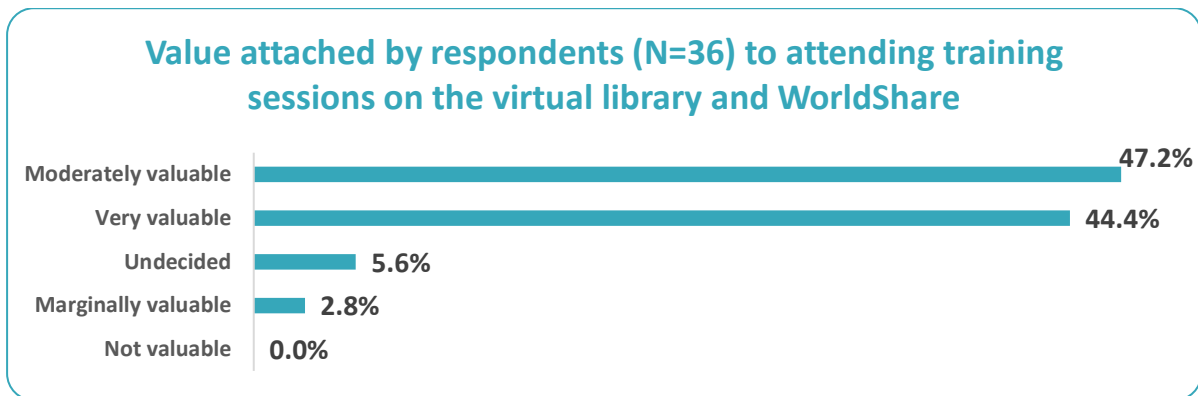


Figure 25: Value attached by respondents to attending training sessions on the Virtual Library and WorldShare

4.2.4.10 Value attached by respondents to training on literature review and search strategies

Of the respondents (N=35) answering this question, 62.9% found this workshop to be very valuable. None of the respondents indicated that this workshop was of no value. This is a positive result that the eRKC might wish to take note of (Figure 26).

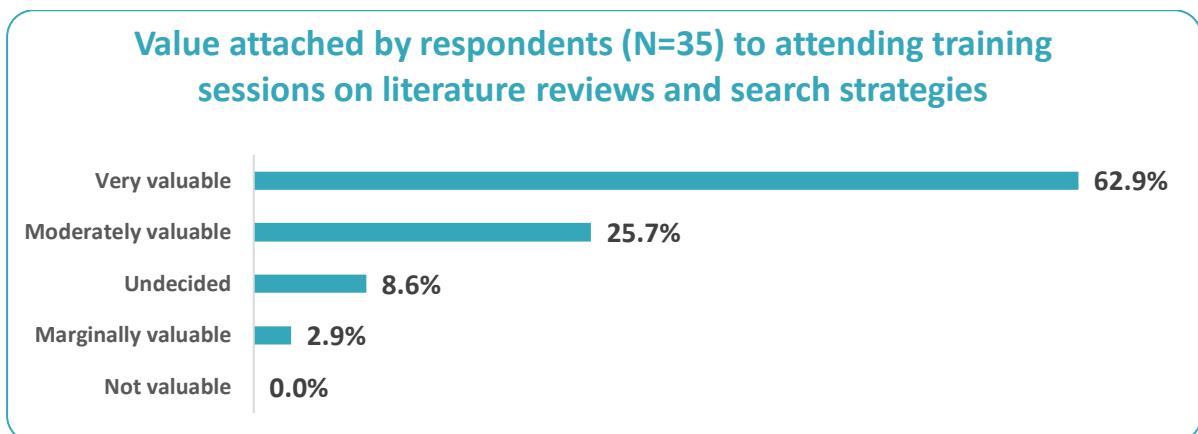


Figure 26: Value attached by respondents to attending training sessions on literature reviews and search strategies

4.2.4.11 Value attached by respondents to training on responsible authorship: iThenticate

Of the respondents (N=34) answering this question, 82.4% indicated that they had found these workshops to be very valuable. Only one (2.9%) indicated this workshop as marginally valuable. Although this is a low response rate, it might indicate an opportunity for the eRKC to follow up to ensure client satisfaction and to promote this workshop further (Figure 27).

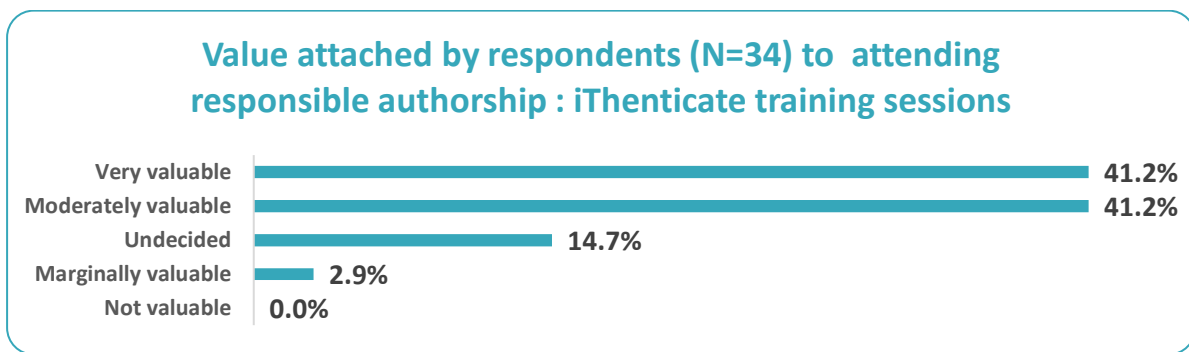


Figure 27: Value attached by respondents to attending responsible authorship: iThenticate training sessions

4.2.4.12 Value attached by respondents to training on ORCID and Google Scholar profiles

Of the respondents (N=35) answering this question, 82.9% found attending this workshop to be moderately valuable while 11.4% indicated that they were undecided as to its value. This might indicate that there is room for improvement in the planning and presentation thereof. No respondents indicated that this workshop was not valuable, something of which the eRKC can be proud (Figure 28).

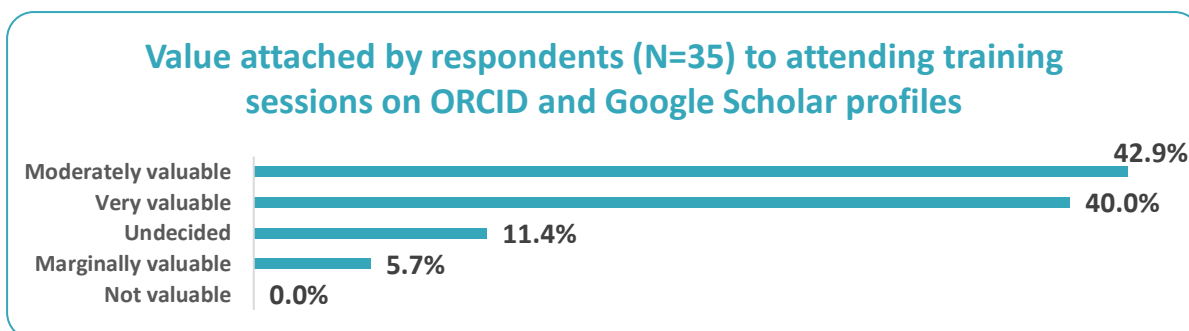


Figure 28: Value received from attending training sessions on ORCID and Google Scholar profiles

4.2.4.13 Value attached by respondents to training on how to use Scopus

Of the respondents (N=34) answering this question, 32.4% indicated that they found these workshops to be very valuable, while 41.2% found them to be moderately valuable. Only two (5.9%) indicated this workshop as marginally valuable. (Figure 29).

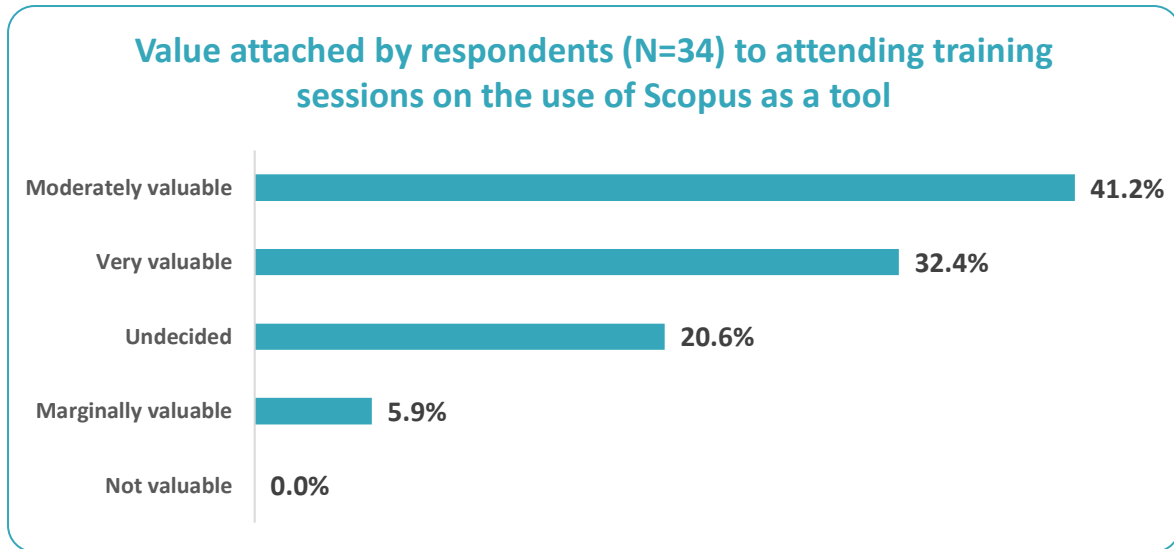


Figure 29: Value attached by respondents to attending training sessions on the use of Scopus as a tool

4.2.4.14 Value attached by respondents to training on how to use Research Africa

Of the respondents (N=33) answering this question, 27.3% indicated that they found these workshops to be very valuable. Only one (3%) found the workshop to be marginally valuable and one (3%) found it to be not valuable (Figure 30).

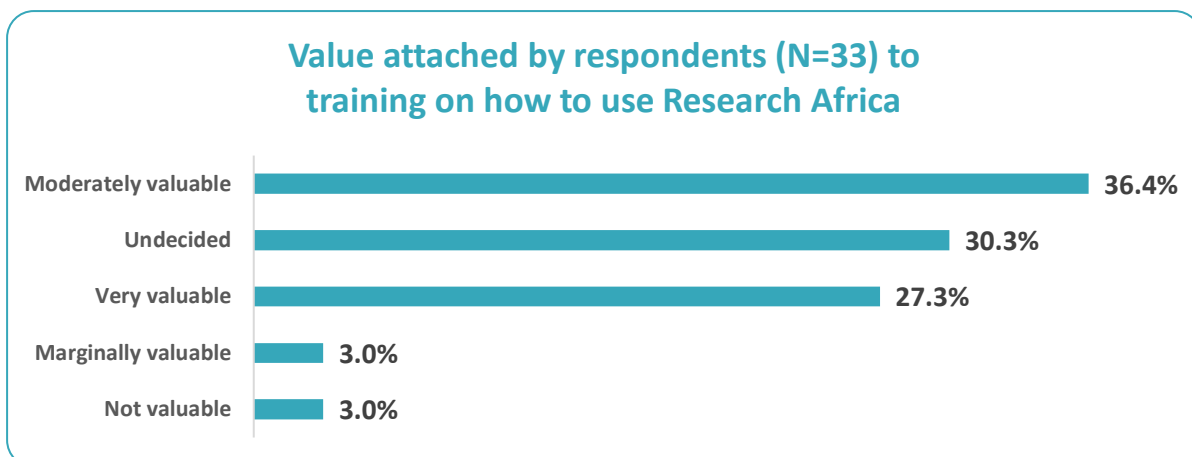


Figure 30: Value attached by respondents to training on how to use Research Africa

4.2.4.15 Value attached by respondents to training on data deposit and curation processes at the HSRC

Of the respondents (N=36) answering this question, 50% indicated that they found this workshop to be very valuable, while 19.4% found it to be moderately valuable. None of the respondents indicated that this workshop was not valuable at all, which is a positive result that the eRKC might wish to take note of (Figure 31).

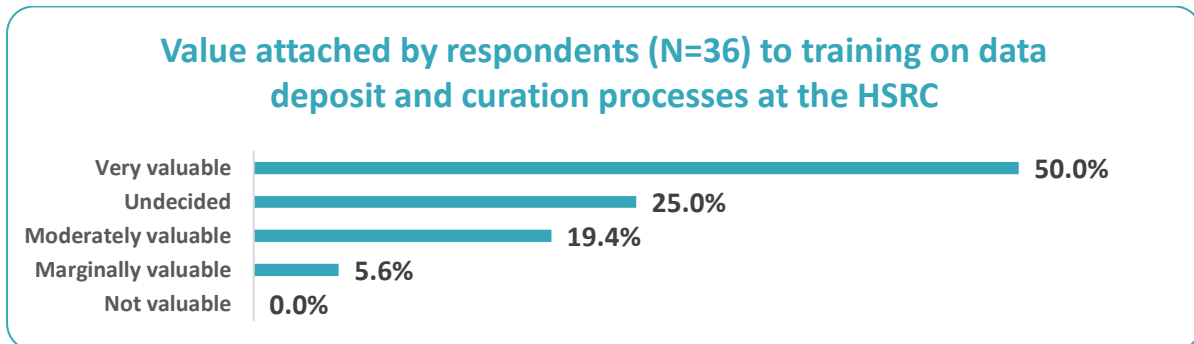


Figure 31: Value attached by respondents to training on data deposit and curation processes at the HSRC

4.2.4.16 Value attached by respondents to training on qualitative and quantitative data management

Of the respondents (N=32) answering this question, 37.5% indicated that they found this workshop to be very valuable. Interestingly, 34.4% of the respondents selected 'undecided' in respect of the value of this workshop. None of the respondents indicated that this workshop was not valuable at all, which is a positive result that the eRKC might wish to take note of (Figure 32).

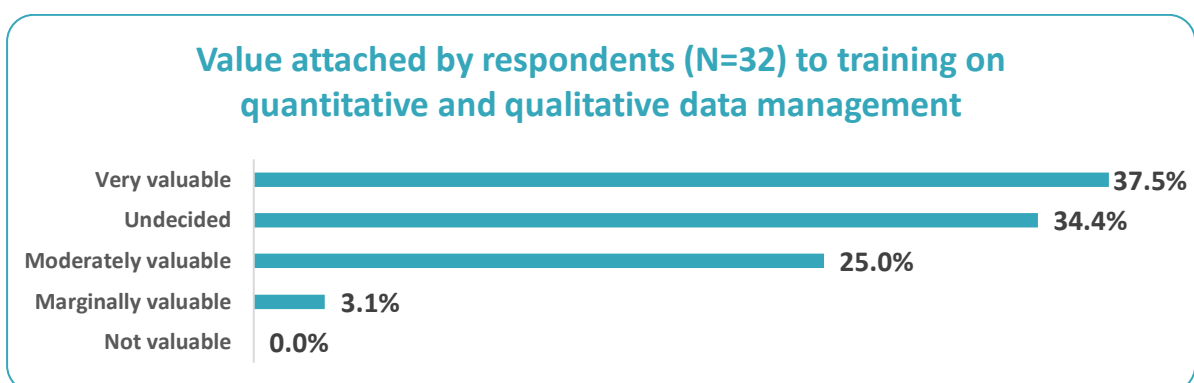


Figure 32: Value attached by respondents to training on quantitative and qualitative data management

4.2.4.17 Value attached by respondents to training on research output accreditation and reporting

Of the respondents (N=32) answering this question, 39.4% found attending this workshop to have been moderately valuable, while 36.4% found it to be very valuable. No respondents indicated that this workshop was not valuable, which is a positive outcome that the eRKC team might wish to take note of (Figure 33).

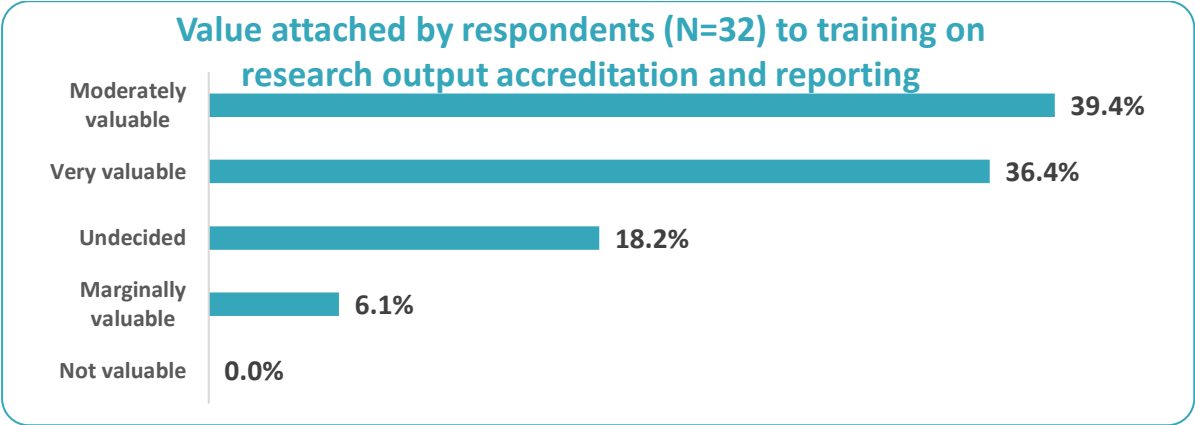


Figure 33: Value attached by respondents to training on research output accreditation and reporting

4.2.4.18 Value attached by respondents to training on potentially fake publishers and conferences

Of the respondents (N=33) answering this question, 42.4% indicated that the workshop was very valuable. None of the respondents indicated that this workshop had no value, which is a positive result that the eRKC might wish to take note of (Figure 34).

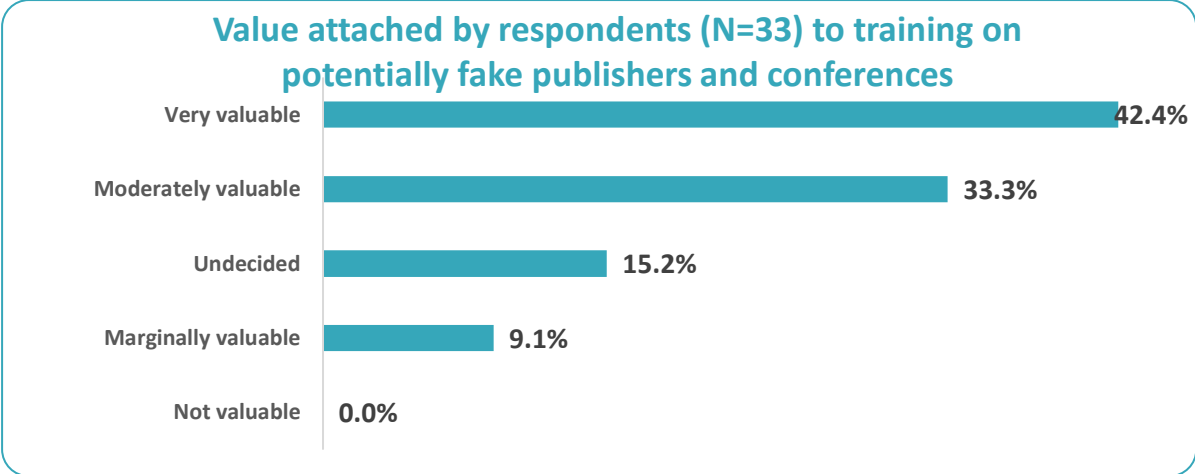


Figure 34: Value attached by respondents to training on potentially fake publishers and conferences

4.2.4.19 Value attached by respondents to training on bibliographic management: Mendeley

Of the respondents (N=31) answering this question, 54.8% indicated that they found the workshop to be very valuable, while 19.4% found it to be moderately valuable. None of the respondents indicated that this workshop was not valuable at all, which is a positive result that the eRKC might wish to take note of (Figure 35).

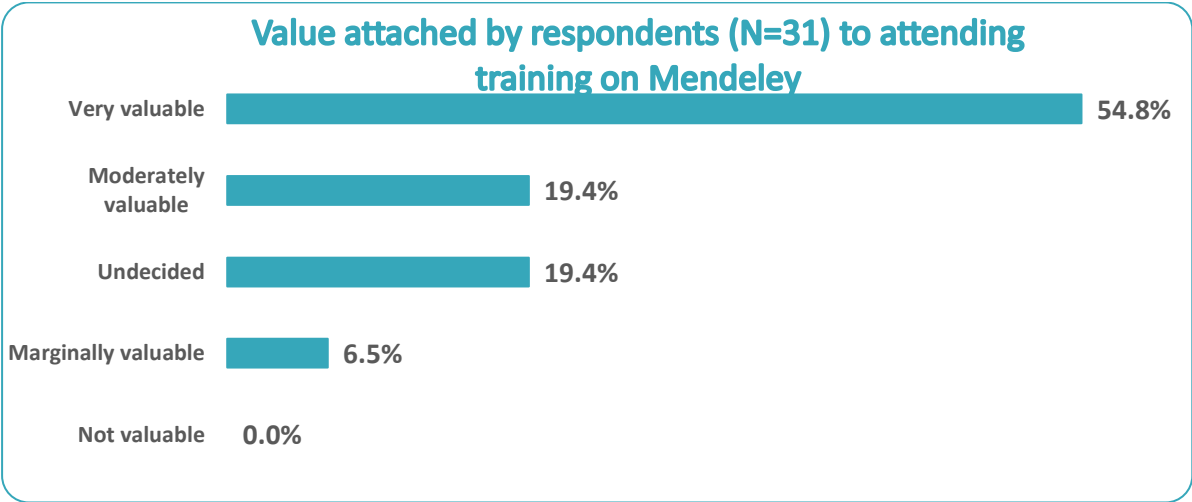


Figure 35: Value attached by respondents to training sessions on Mendeley

4.2.4.20 Rating the importance to their work of future awareness training on the use of metrics for research impact

Of the respondents (N=53) answering this question, 45.3% indicated that they believed this kind of training was very important to their work. One respondent (1.9%) indicated that this service was not important (Figure 36).

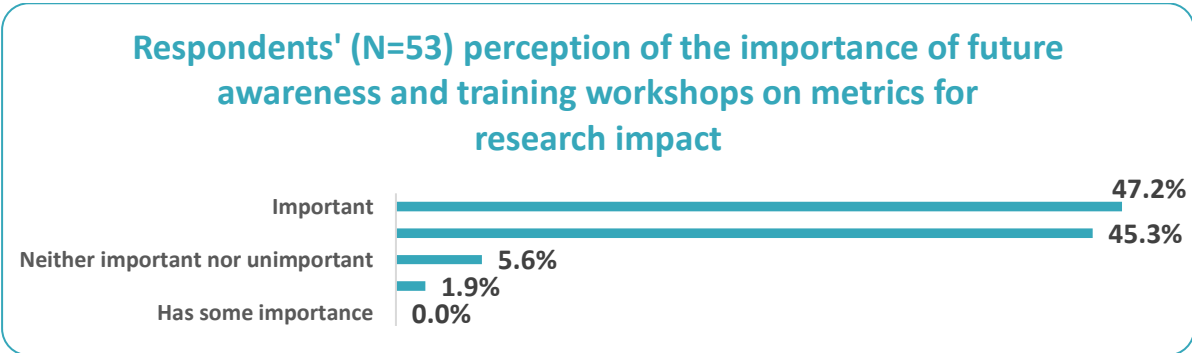


Figure 36: Respondents' perception of the importance of future awareness and training workshops on metrics for research impact

4.2.5 Research enabling services during the Gather phase of the research life cycle

4.2.5.1 Access to useful and high-quality information resources

The services listed below form an integral part of the information resources provided by the eRKC.

- Print collection (books and journals)
- e-Resources (e-journals and e-books)
- HSRC's Research Publications collection
- HSRC's Research Data collection
- Spatial information collection

Questionnaire respondents were asked to rate the importance to their work of each of the services listed below.

- Access to useful and high-quality print collection (books and journals)
Of the respondents, 37.3% considered this service to be 'very important', while 9.8% considered it to be 'not important'.
- Access to useful and high-quality e-resources (e-journals and e-books)
Of the respondents, 65.4% considered this service to be 'very important', while 1.9% considered it to be 'not important'.
- Access to useful and high-quality research output publications within the HSRC's repository
Of the respondents, 44.2% considered this service to be 'very important', while none considered it to be 'not important'.
- Access to useful and high-quality research data sets within the HSRC's repository
Of the respondents, 26.9% considered this service to be 'very important', while 1.9% considered it to be 'not important'.
- Access to useful and high-quality spatial information on projects and methods similar to those used in previous studies
Of the respondents, 17% considered this service to be 'very important', while 1.9% considered it to be 'not important'.

The results are reflected in Figure 37.

Importance of access to useful and high-quality information resources

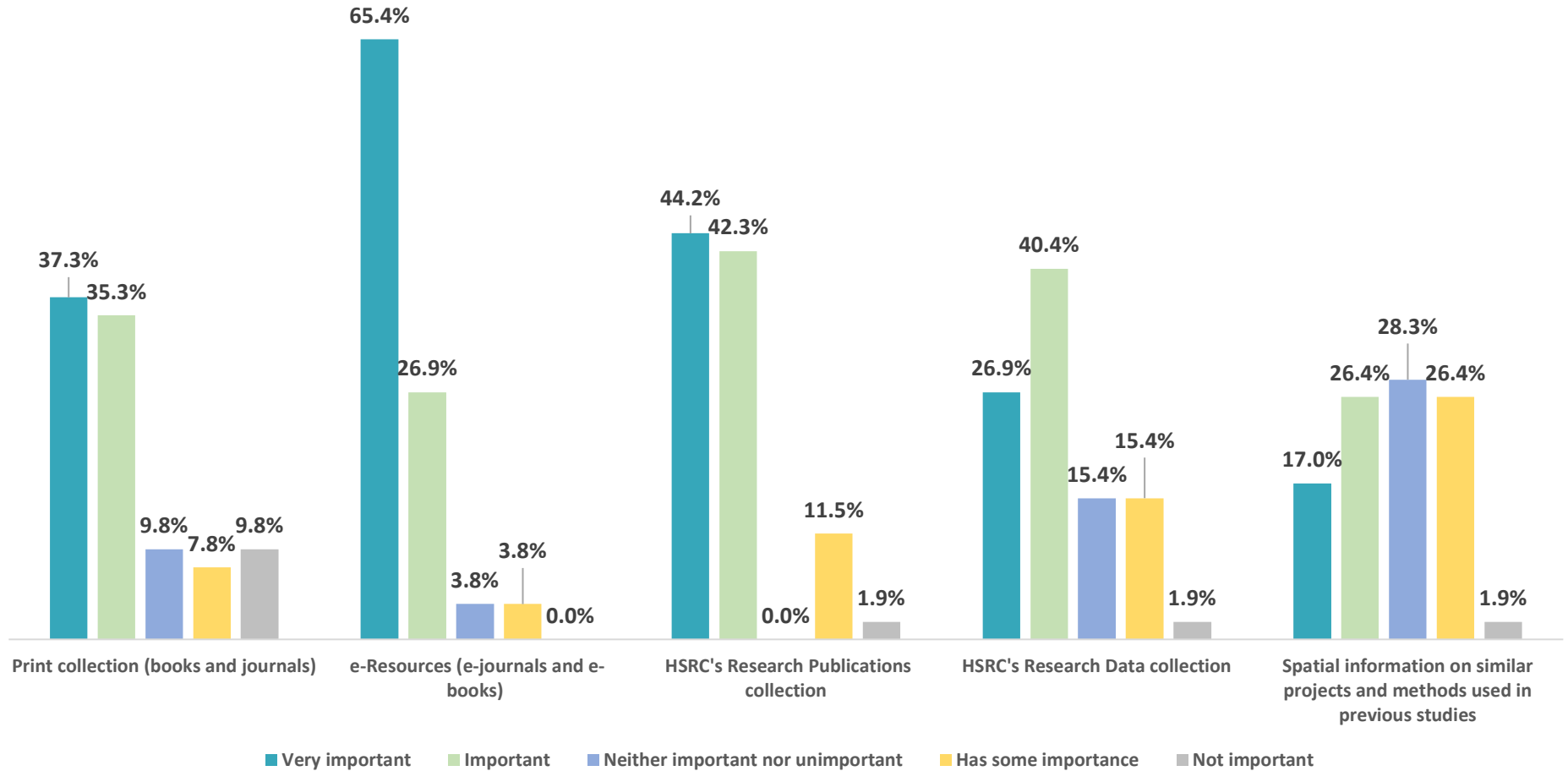


Figure 37: Respondents' perception of the importance of access to useful and high-quality information resources

Questionnaire respondents were asked if they used or had considered using each of the services listed below:

- Print collection (books and journals)
Of the respondents, 35.8% selected “Yes, used it regularly”, while 7.5% selected “No, will definitely not use it”.
- e-Resources (e-journals and e-books)
Of the respondents, 65.4% selected “Yes, used it regularly”, while 3.8% selected “No, will definitely not use it”.
- HSRC’s Research Publications collection
Of the respondents, 44.2% selected “Yes, used it regularly”, while none selected “No, will definitely not use it”.
- HSRC’s Research Data collection
Of the respondents, 26.9% selected “Yes, used it regularly”, while 15.4% selected “No, will definitely not use it”.
- Spatial information collection on similar projects and methods used to those used in previous studies
Of the respondents, 17% selected “Yes, used it regularly”, while 1.9% selected “No, will definitely not use it”.

The results might be an indication for the eRKC to expand the above collections and to create awareness for these collections among the HSRC researchers. The results are reflected in Figure 38.



Figure 38: Respondents' usage of useful and high-quality information resources

Questionnaire respondents were asked if, in general, they were satisfied with each of these services.

With regard to the different collections, access to useful and high-quality e-resources was accorded the highest percentage of 39.6% under the “very satisfied” measure.

None of the respondents indicated that they were very dissatisfied with any of the collections listed above (Figure 39).

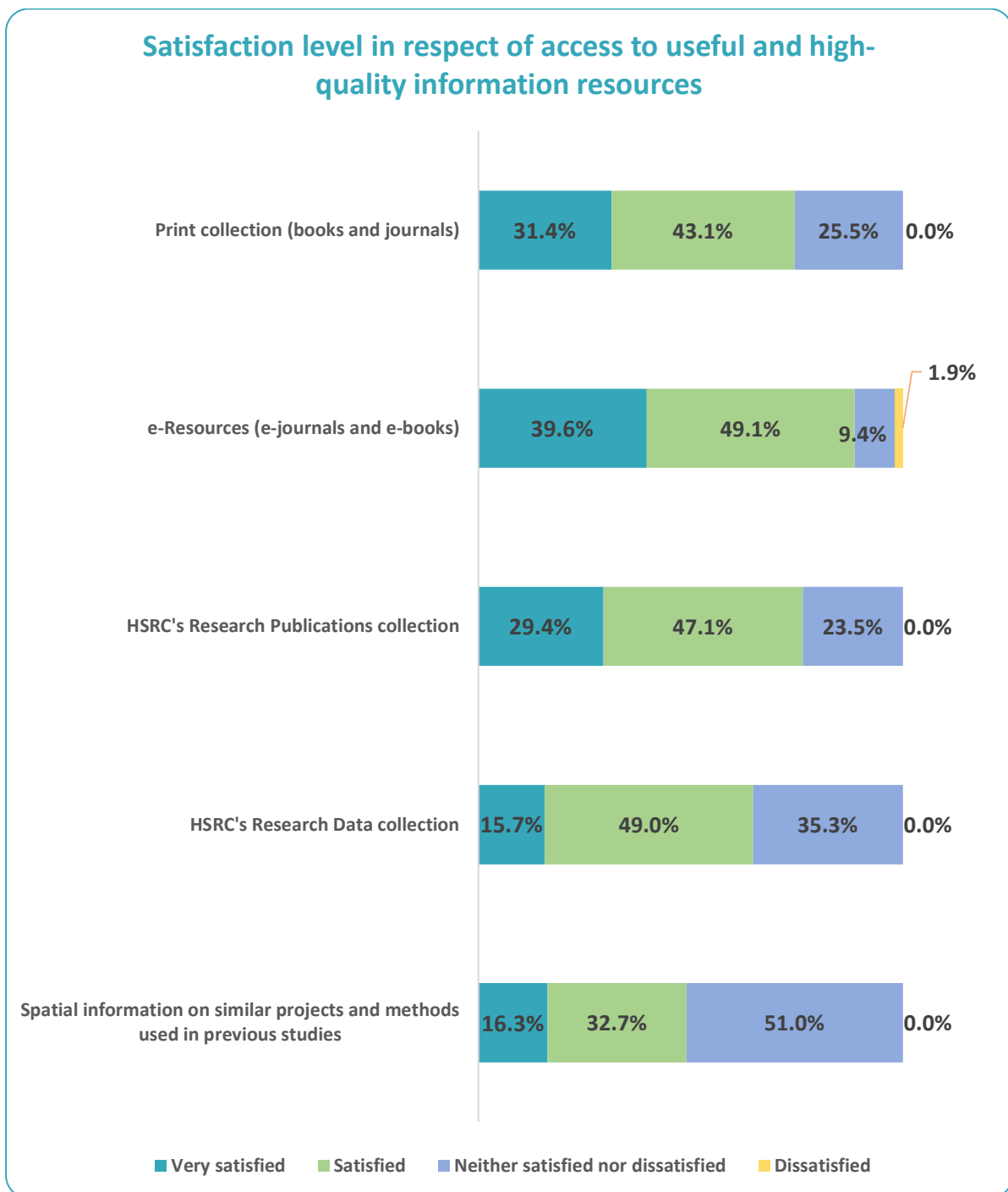


Figure 39: Satisfaction level in respect of access to useful and high-quality information resources

4.2.5.2 Respondents' rating of the importance to their work of guidance on data management planning and completing a data management plan service

Of the respondents to this question (N=53), 52.8% found this service to be very important to their work. Only one (1.9%) respondent felt that this service was not important to his/her work (Figure 40).

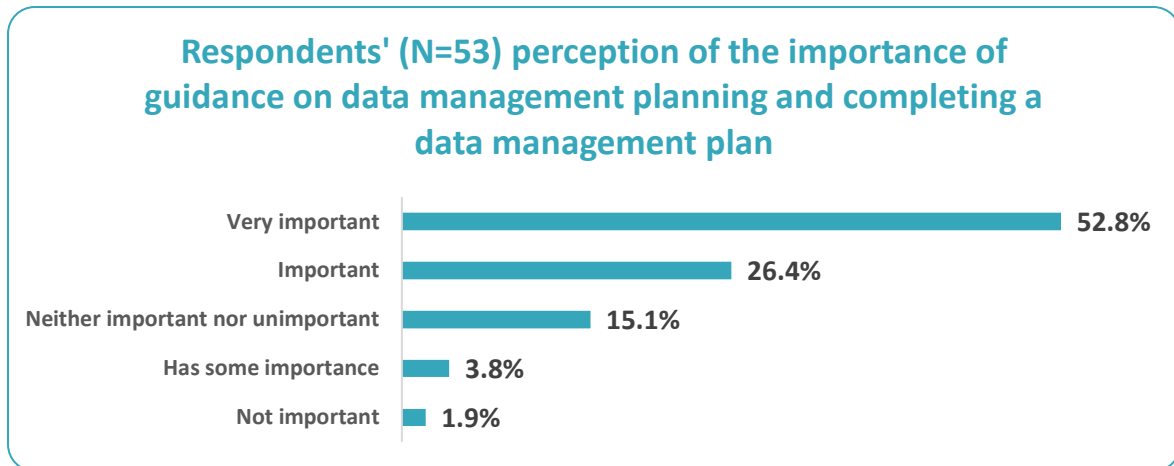


Figure 40: Respondents' perception of the importance of guidance on data management planning and completing a data management plan

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=53), 18.9% used this service regularly, while 24.5% used it sporadically. Of the respondents, 20.8% had not used or considered using this service, which might indicate that respondents, to date, had not needed to use it. None of the respondents indicated that they would not use this service (Figure 41).

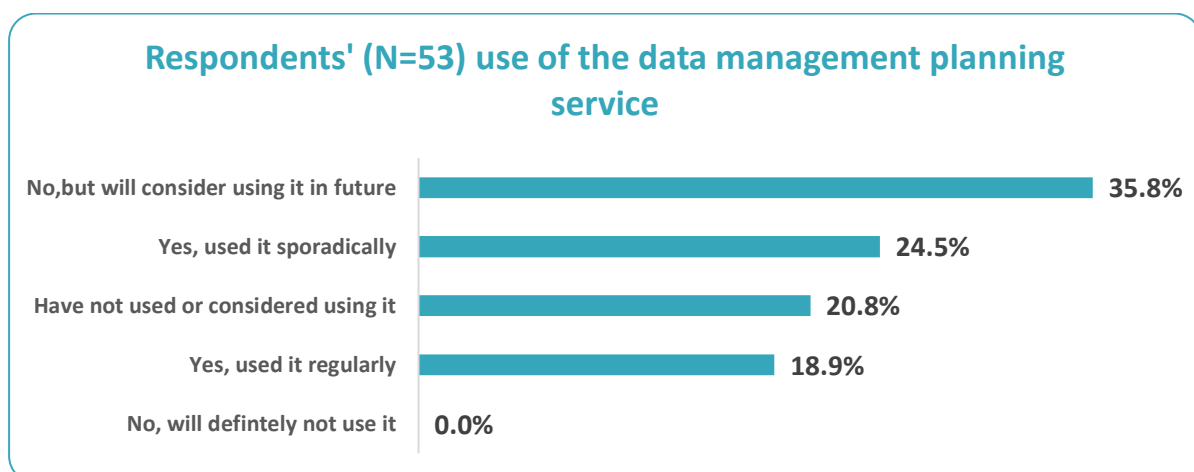


Figure 41: Respondents' use of the data management planning service

Questionnaire respondents were asked if, in general, they were satisfied with this service. As indicated in Figure 42, 39.1% of respondents (N=23) were very satisfied with the service. The response (17.4%) to the 'neither satisfied nor dissatisfied' measure is noteworthy and may be an indication for the eRKC to expand and actively promote this service to HSRC researchers. None of the respondents indicated that they were dissatisfied or very dissatisfied with this service.

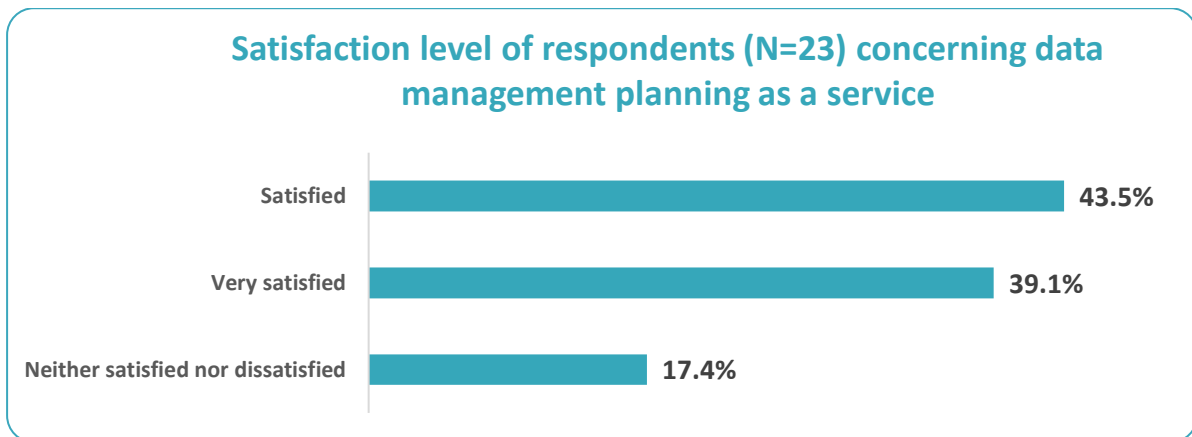


Figure 42: Satisfaction level of respondents concerning data management planning as a service

4.2.5.3 Respondents' rating of the importance of reviewing data management plans as part of the ethics application process

Figure 43 shows that 50% of the respondents (N=53) found this service to be very important to their work. None of the respondents indicated that the service was not important to their work.

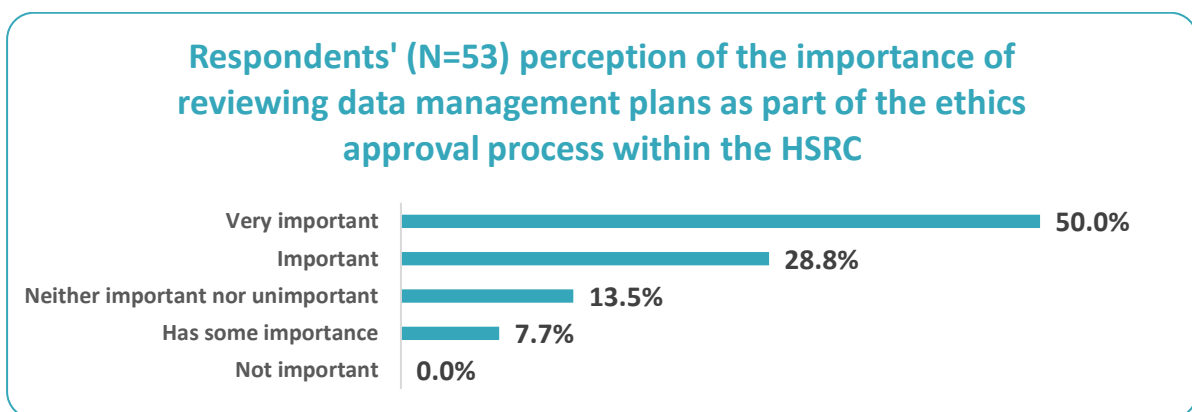


Figure 43: Respondents' perception of the importance of reviewing data management plans as part of the ethics application process within the HSRC

Questionnaire respondents were asked if they used or had considered using this service. Figure 44 shows that 24.5% of the 53 respondents had used this service regularly. None of the respondents indicated that they would not use this service.

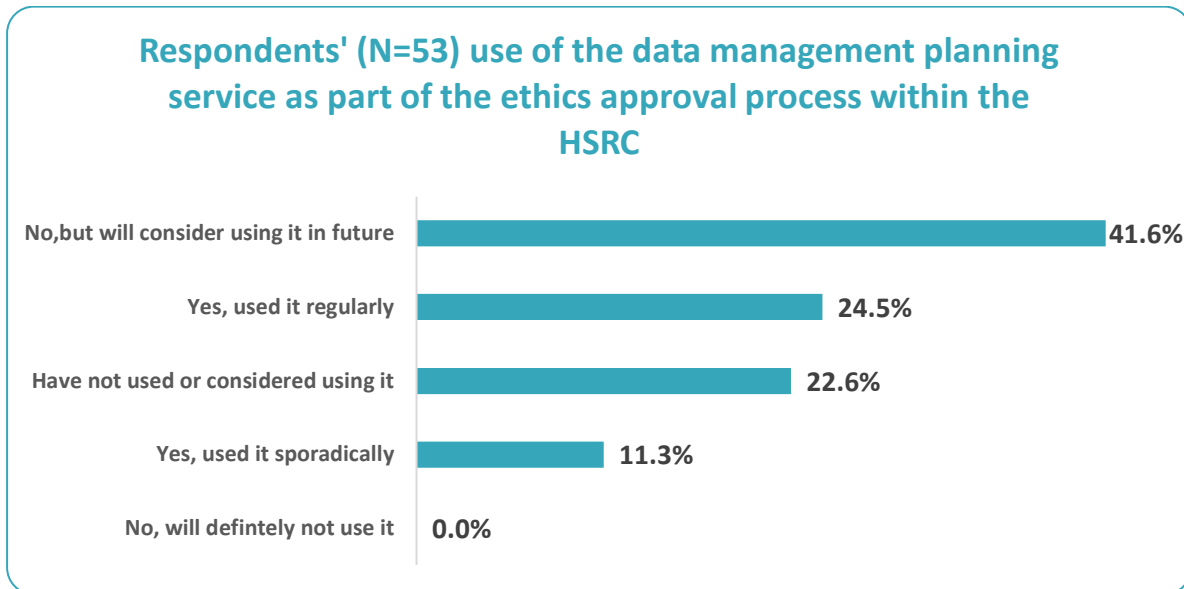


Figure 44: Respondents' use of the data management planning service as part of the ethics approval process within the HSRC

Questionnaire respondents were asked if, in general, they were satisfied with this service. Of those who did respond (N=19), 42.1% were very satisfied with the service and 57.9% were satisfied, accounting for all responses. The eRKC might wish to take note of this result as a positive outcome (Figure 45).

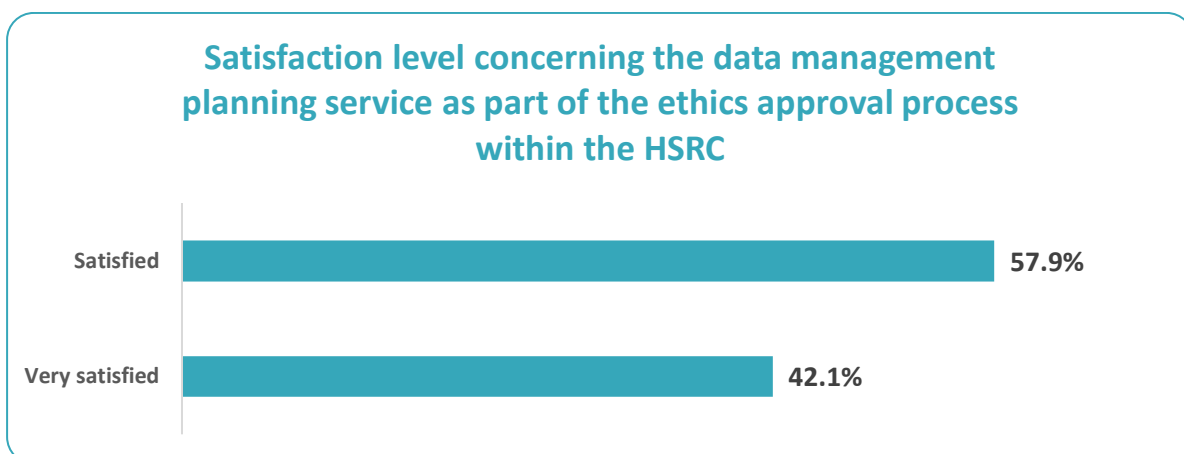


Figure 45: Satisfaction level concerning the data management planning service as part of the ethics approval process within the HSRC

4.2.5.4 Respondents' rating of the importance to their work of consultations and support in the collection of field data

Of the respondents (N=53), 43.4% indicated that this service was very important to their work, while 35.8% indicated that it was important. Noteworthy are the four (7.5%) respondents who indicated that this service was not important to their work (Figure 46).

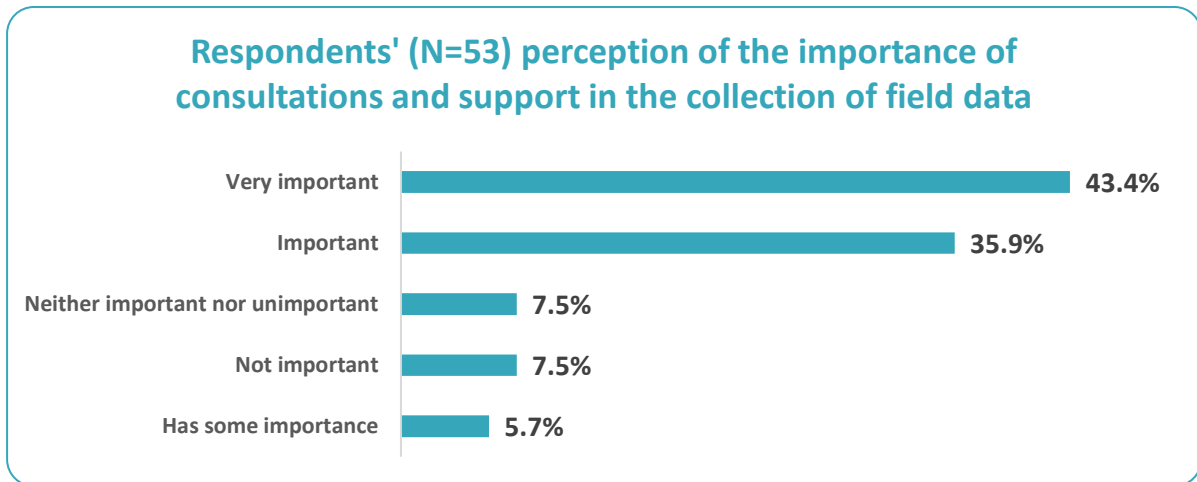


Figure 46: Respondents' perception of the importance of consultations and support in collecting field data

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=53), 17% used this service regularly, while 15.1% used it sporadically. Only two (3.8%) of the respondents indicated that they would not use this service. This result might be an indication of an opportunity for the eRKC to expand and actively promote this service to the HSRC researchers (Figure 47).

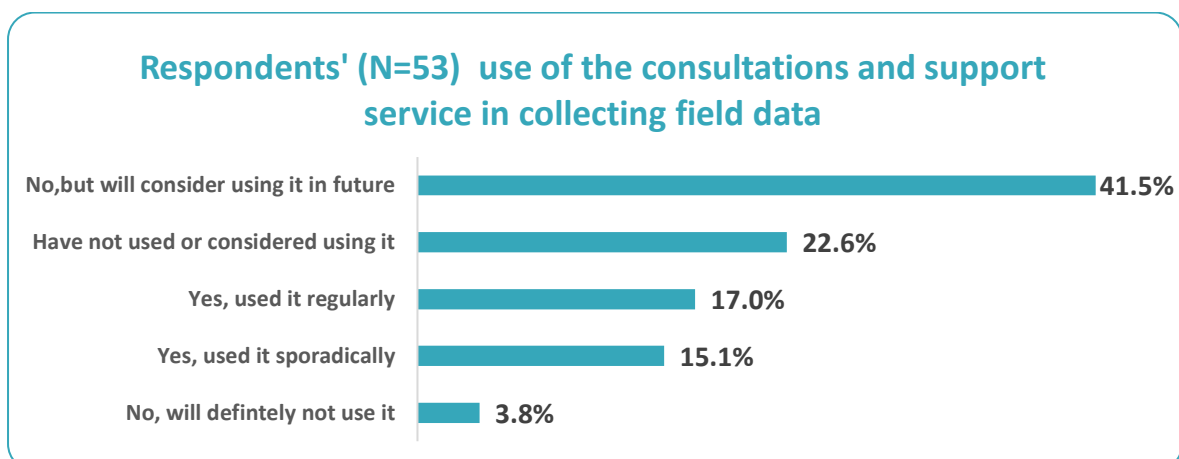


Figure 47: Respondents' use of the consultations and support service in collecting field data

Questionnaire respondents were asked if, in general, they were satisfied with this service. Only 17 responses were recorded for this question where 53% of respondents indicated that they were very satisfied, while none indicated that they were dissatisfied or very dissatisfied (Figure 48).

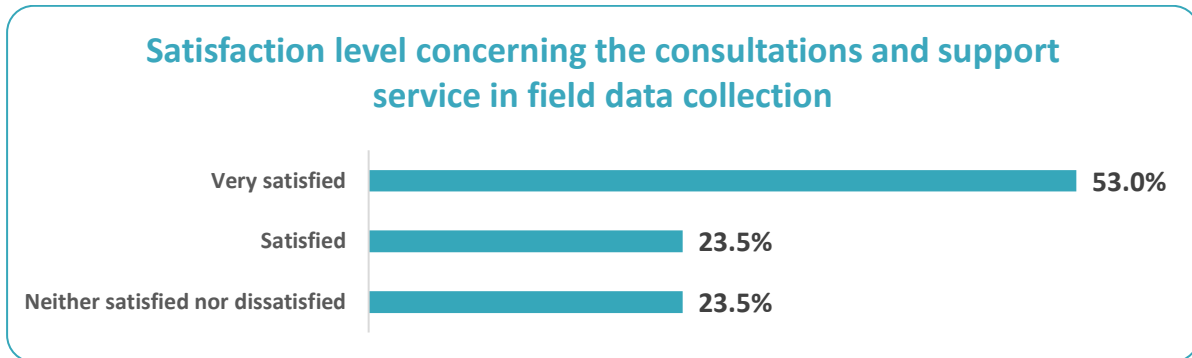


Figure 48: Satisfaction level concerning the consultations and support service in field data collection

4.2.6 Research enabling services during the Create phase of the research life cycle

4.2.6.1 Respondents' rating of the importance to their work of the service of clarifying copyright and intellectual property rights

Of the respondents (N=52), 50.9% found this service to be very important to their work, while 35.8% found it to be important. Only, two (3.8%) respondents indicated that the service was not important to their work (Figure 49).

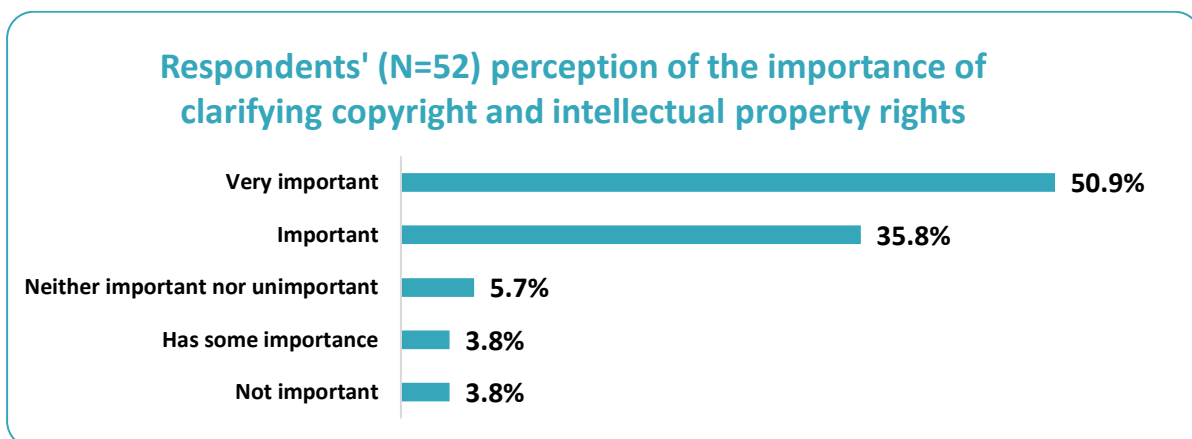


Figure 49: Respondents' perception of the importance of clarifying copyright and intellectual property rights

Respondents were asked if they used or had considered using this service. Of the respondents (N=52), 25% used it sporadically, while 9.6% used it regularly. Noteworthy, although part of the low response, are the two (3.8%) respondents who indicated that they would not use this service (Figure 50).

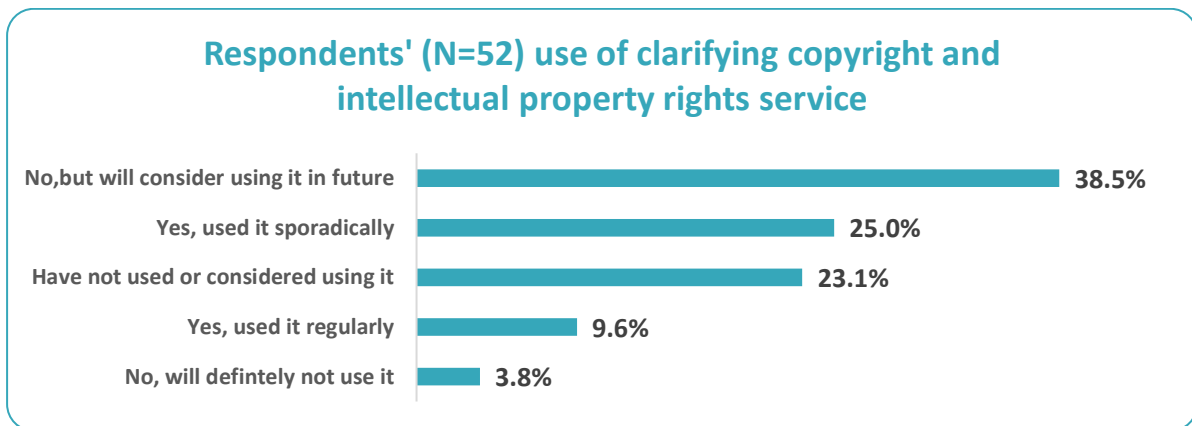


Figure 50: Respondents' use of the service of clarifying copyright and property rights

Questionnaire respondents were asked if, in general, they were satisfied with this service. Only 19 responses were recorded for this question where 57.9% of respondents were satisfied with the service, while 26.3% were very satisfied. None of the respondents indicated that they were dissatisfied or very dissatisfied with the service. The eRKC might wish to take note of the positive outcome (Figure 51).

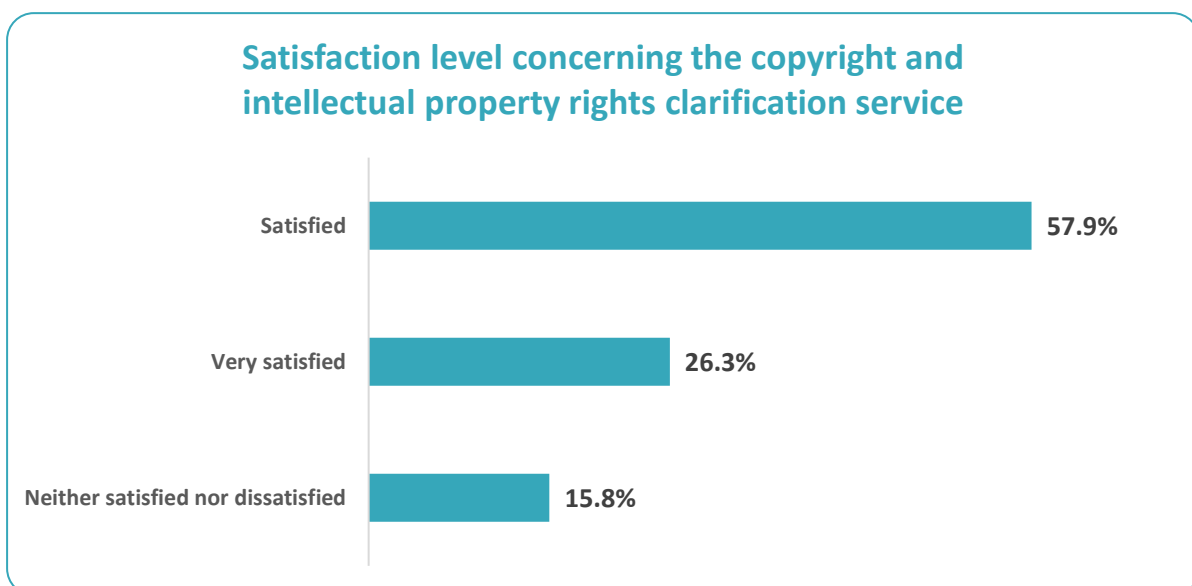


Figure 51: Satisfaction level concerning the copyright and intellectual property rights clarification service

4.2.6.2 Respondents' rating of the importance to their work of guidance on citation styles and referencing.

Of the respondents (N=53), 52.8% indicated that this service was very important to their work. Only one (1.9%) indicated that the service was not important to their work (Figure 52).

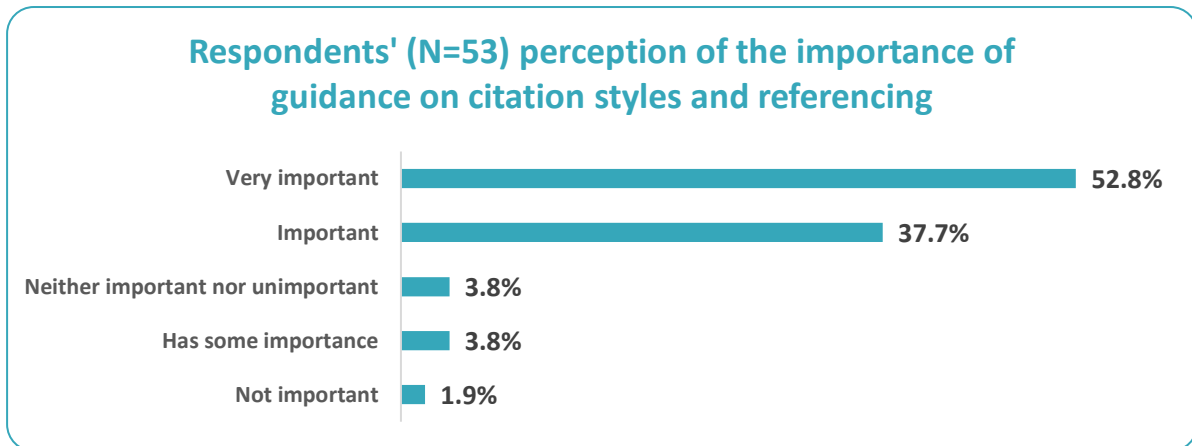


Figure 52: Respondents' perception of the importance of guidance on citation styles and referencing

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=53), 24.5% used it sporadically, while 13.2% used the service regularly. Of the respondents 37.7% had not used this service but would consider using it in the future. The fact that four (7.5%) respondents indicated that they would not use this service is noteworthy (Figure 53).

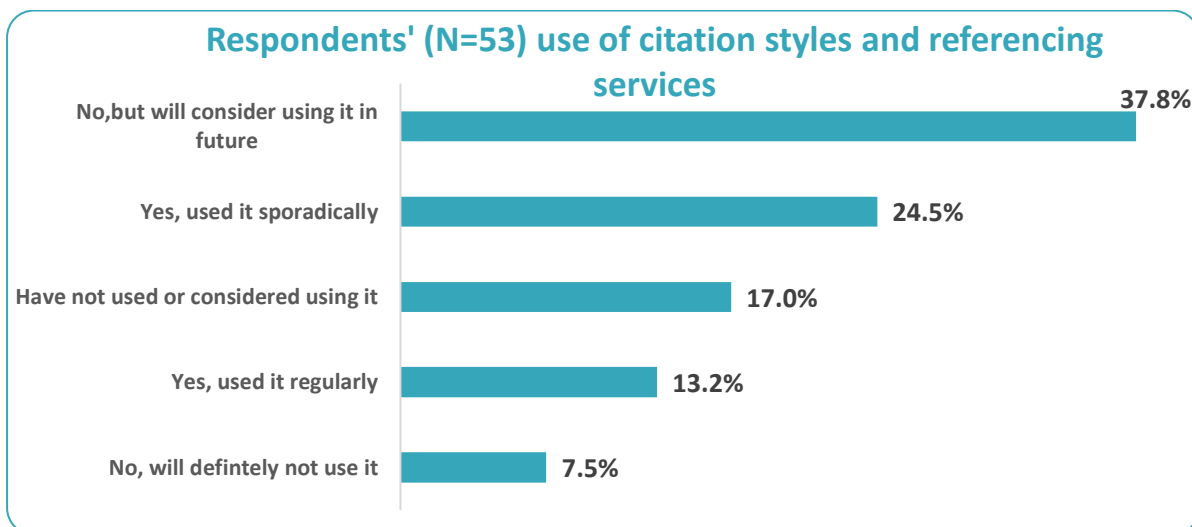


Figure 53: Respondents' use of the citation styles and referencing services

Questionnaire respondents were asked if, in general, they were satisfied with this service. Only 20 responses were recorded for this question and 60% of respondents indicated that they were very satisfied with the service, while 40% were satisfied (Figure 54).

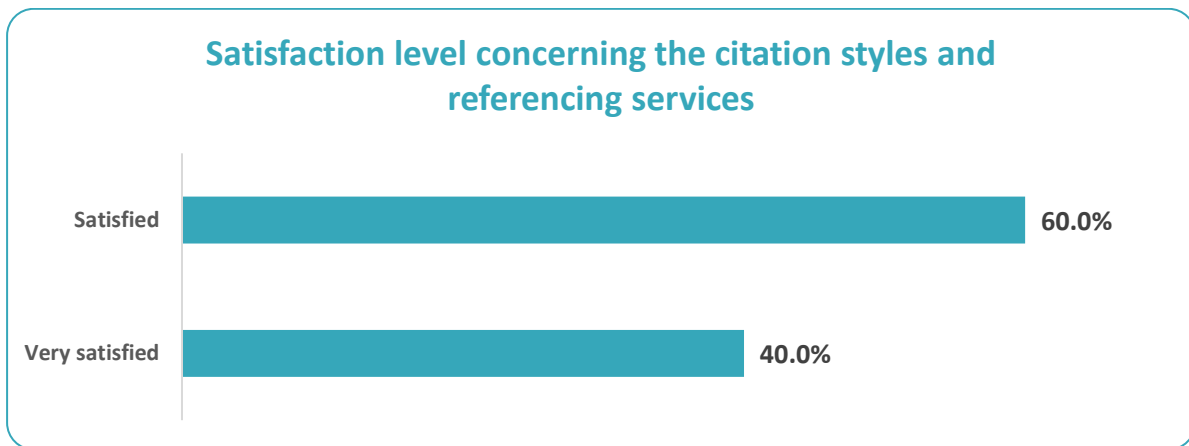


Figure 54: Satisfaction level concerning the citation styles and referencing services

4.2.6.3 Respondent's' rating of the importance to their work of guidance on avoiding plagiarism through the use of software such as Turnitin or iThenticate

Of the respondents (N=51) 68.6% indicated that this service was important to their work, while 27.5% indicated it to be important. None of the respondents indicated that this service was neither important nor unimportant or not important (Figure 55).

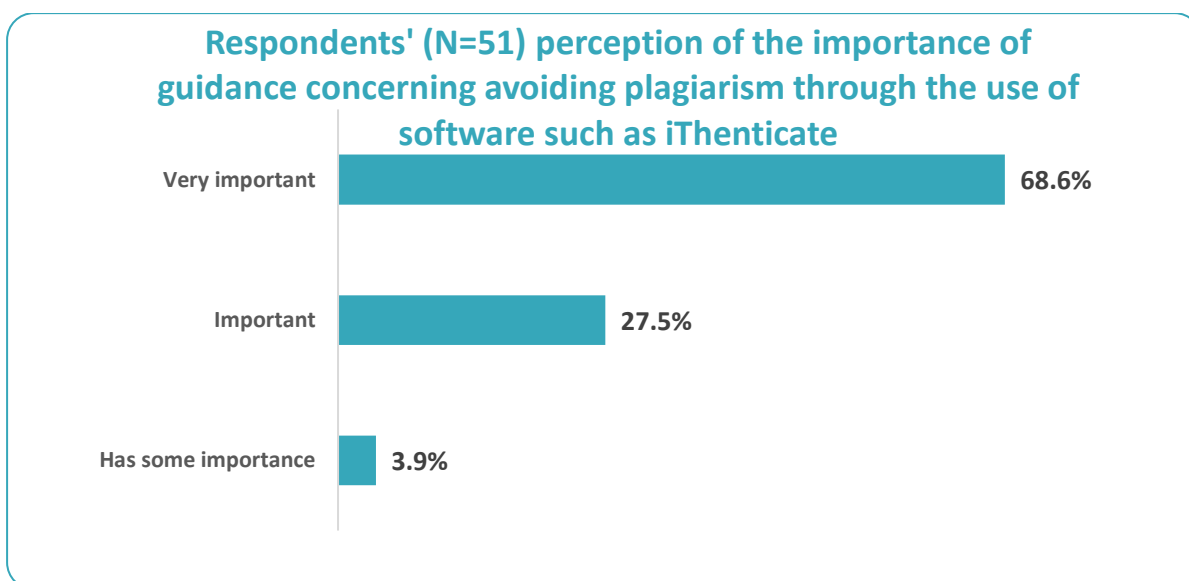


Figure 55: Respondents' perception of the importance of guidance concerning avoiding plagiarism through the use of software such as iThenticate

Questionnaire respondents were asked if they used or had considered using this service. Forty-one (78.8%) of the 52 respondents had used this service regularly while seven (13.5%) had not used this service but would consider using it in the future. No responses were recorded in the ‘will not use the service’ measure (Figure 56).

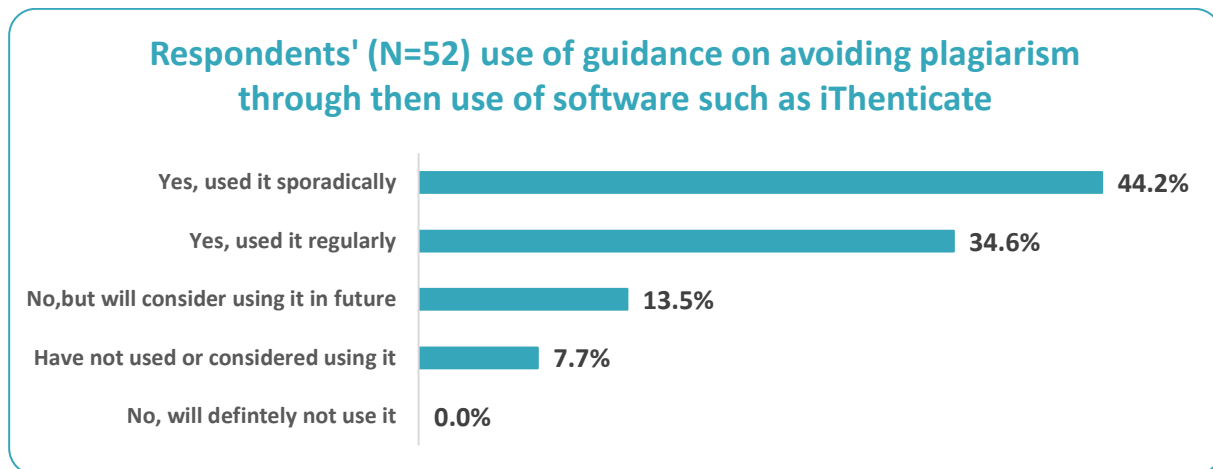


Figure 56: Respondents' use of guidance on avoiding plagiarism through the use of software such as iThenticate

Questionnaire respondents were asked if, in general, they were satisfied with this service. Of the responses (N=41) received, 48.8% of respondents were very satisfied with the service and 43.9% were satisfied with this service. None of the respondents indicated that they were very dissatisfied (Figure 57).

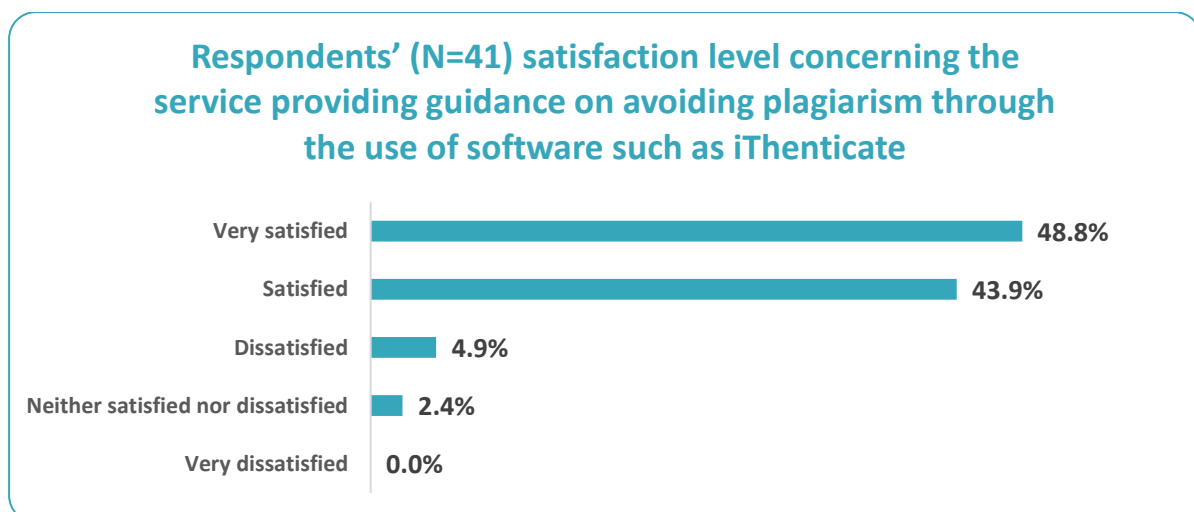


Figure 57: Respondents' satisfaction level concerning the service providing guidance on avoiding plagiarism through the use of software such as iThenticate

4.2.7 Research enabling services during the Share phase of the research life cycle

4.2.7.1 Respondents' rating of the importance to their work of updating professional information on the ORCID platform.

Of the respondents (N=52), 57.7% indicated that this service was very important to their work. None of the respondents indicated that this service was not important (Figure 58).

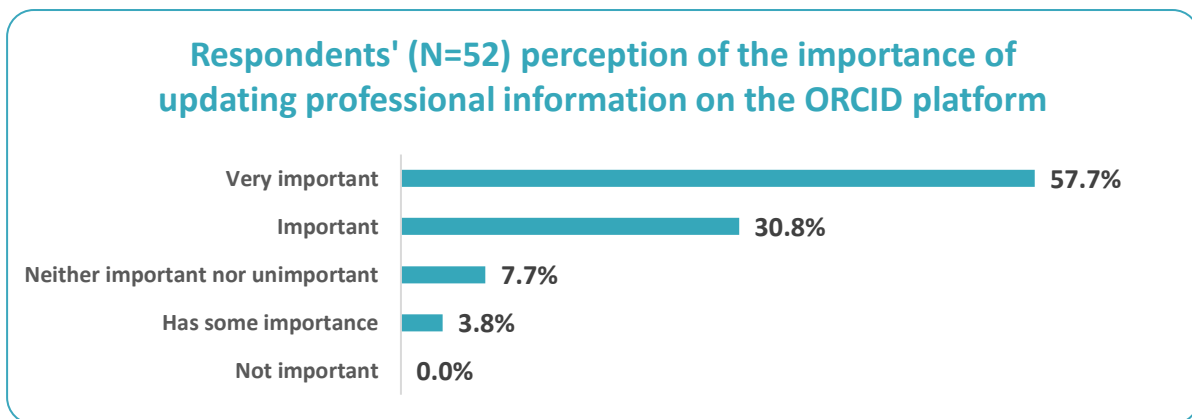


Figure 58: Respondents perception of the importance of updating professional information on the ORCID platform

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=53), 28.3% used this service regularly, while 15.1% used it sporadically. Of the respondents 11.3% indicated they had not used or considered using this service, which might indicate that they had not previously needed this service. Only one (1.9%) indicated that he/she would not use this service (Figure 59).

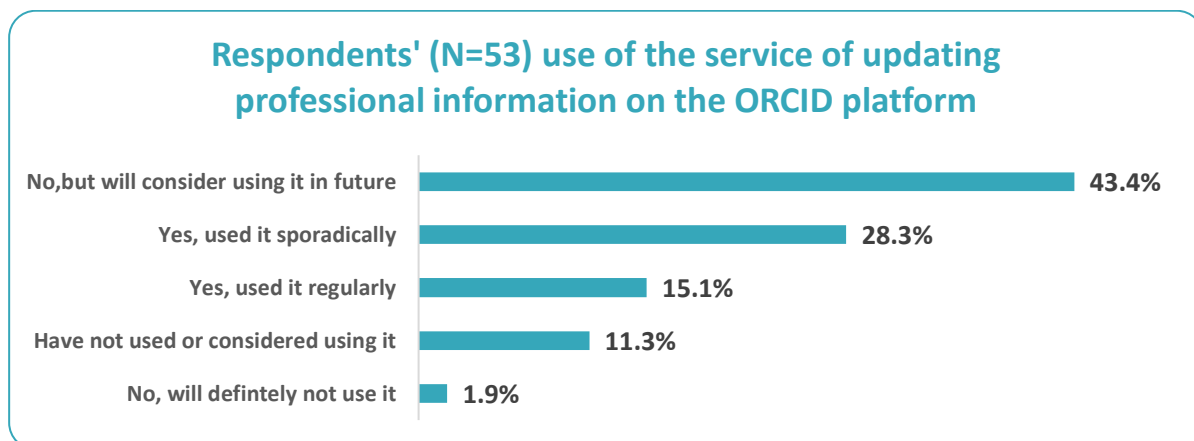


Figure 59: Respondents' use of the service of updating professional information on the ORCID platform

Questionnaire respondents were asked if, in general, they were satisfied with this service. Of the respondents (N=23), 30.4% were very satisfied with this service, while 39.1% were satisfied and 30.4% indicated that they were neither satisfied nor dissatisfied with the service (Figure 60).

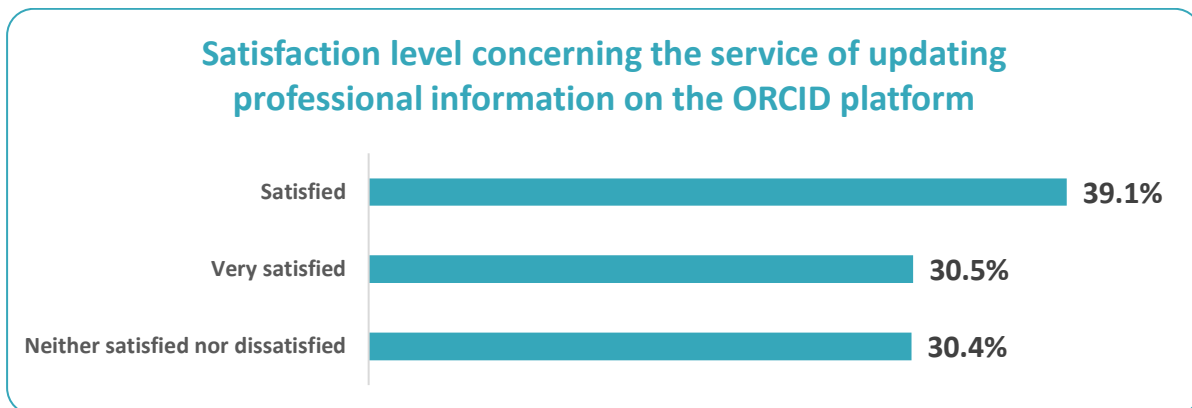


Figure 60: Satisfaction level concerning the service of updating professional information on the ORCID platform

4.2.7.2 Respondents’ rating of the importance to their work of assistance with the use and implications of licences, for example, Creative Commons Licensing.

Of the respondents (N=51), 35.3% indicated that this service was important to their work, while 27.5% believed it to be very important. Of the respondents 7.8% indicated that this service had some importance, while a further (7.8%) indicated that the service is not important (Figure 61).

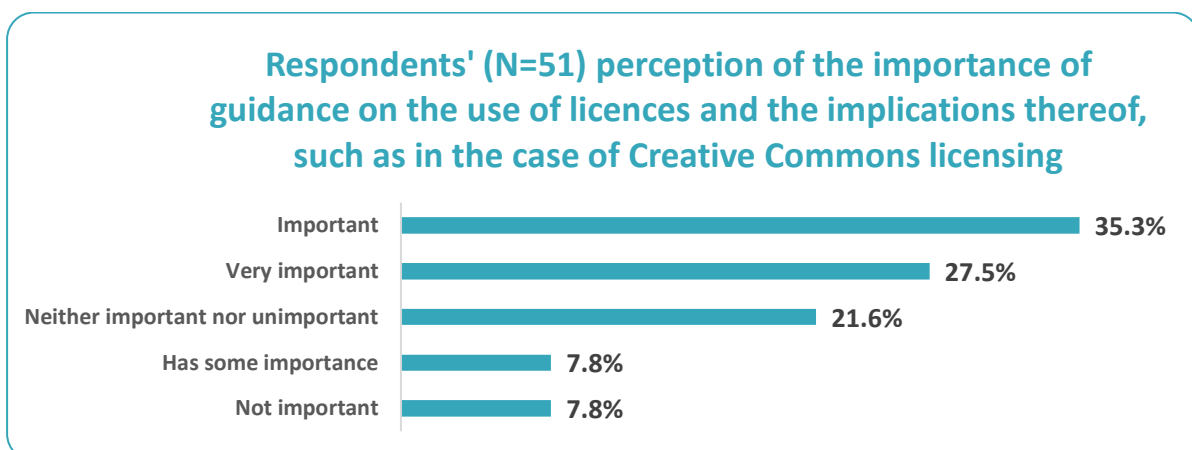


Figure 61: Respondents’ perception of the importance of guidance on the use of licences and the implications thereof – such as in the case of Creative Commons licensing

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=52), 5.8% had used this service regularly while 51.9% had not used this service but would consider using it in the future. These results might indicate an opportunity for the eRKC to expand and promote this service to the HSRC researchers (Figure 62).

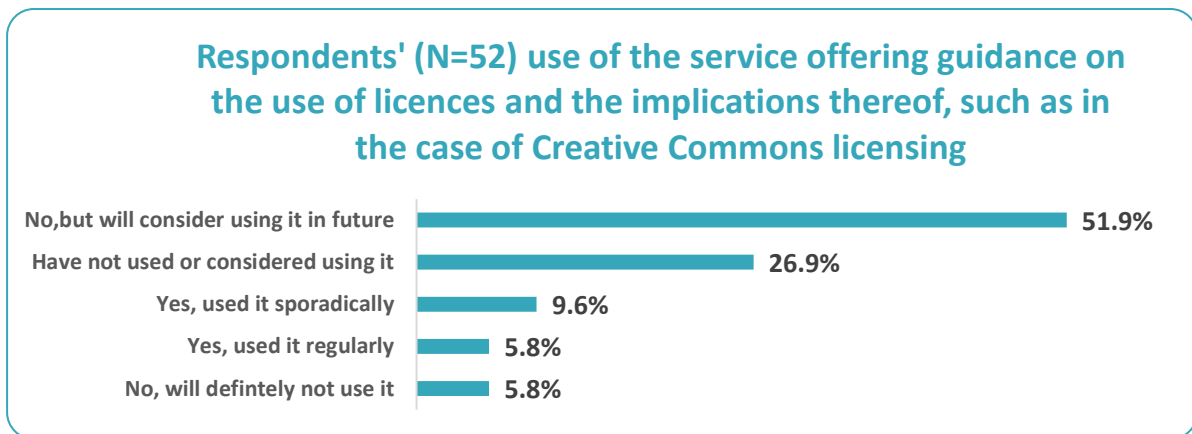


Figure 62: Respondents' use of the service offering guidance on the use of licences and the implications thereof, such as in the case of Creative Commons licensing

Questionnaire respondents were asked if, in general, they were satisfied with this service. Only eight responses were recorded for this question where 50% of respondents were very satisfied with the service and 37.5% were satisfied. None of the respondents indicated a dissatisfied or very dissatisfied response (Figure 63).

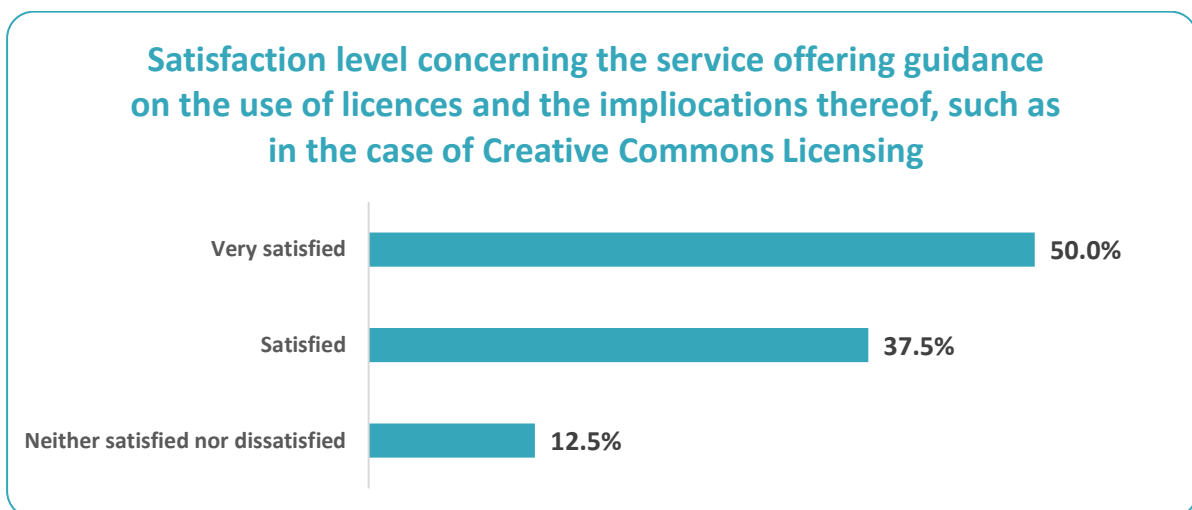


Figure 63: Satisfaction level concerning the service offering guidance on the use of licences and the implications thereof, such as in the case of Creative Commons Licensing

4.2.7.3 Respondents' rating of the importance to their work of selecting suitable accredited journals in which to publish.

Of the respondents (N=53), 67.9% indicated that this service was very important to their work. Only one (1.9%) indicated that this service was not important to his/her work (Figure 64).

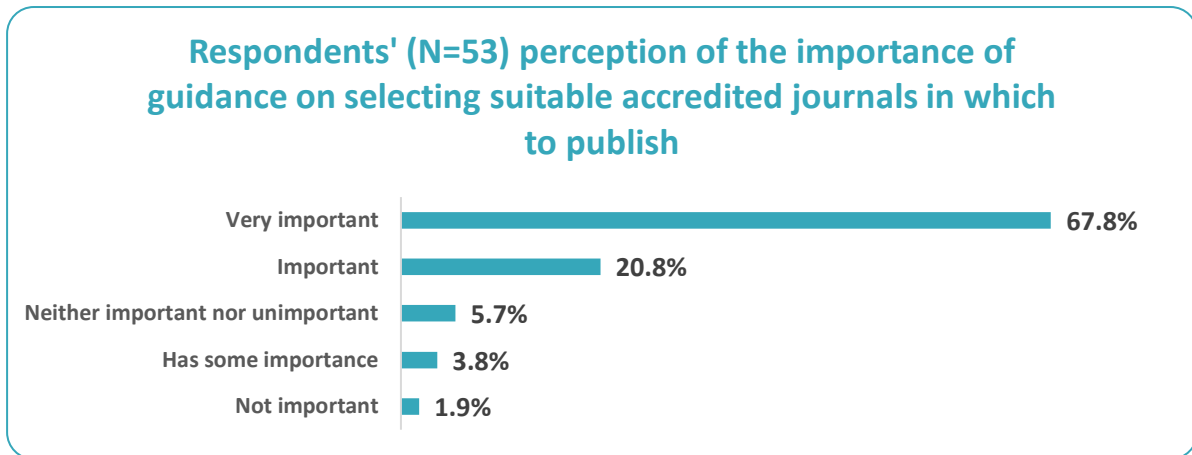


Figure 64: Respondents' perception of the importance of guidance on selecting suitable accredited journals in which to publish

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=53), 32.1% used this service regularly, while 18.9% used it sporadically. Of the respondents 22.6% had not used this service but would consider using it in the future while 5.7% of the respondents indicated that they would not use this service (Figure 65).

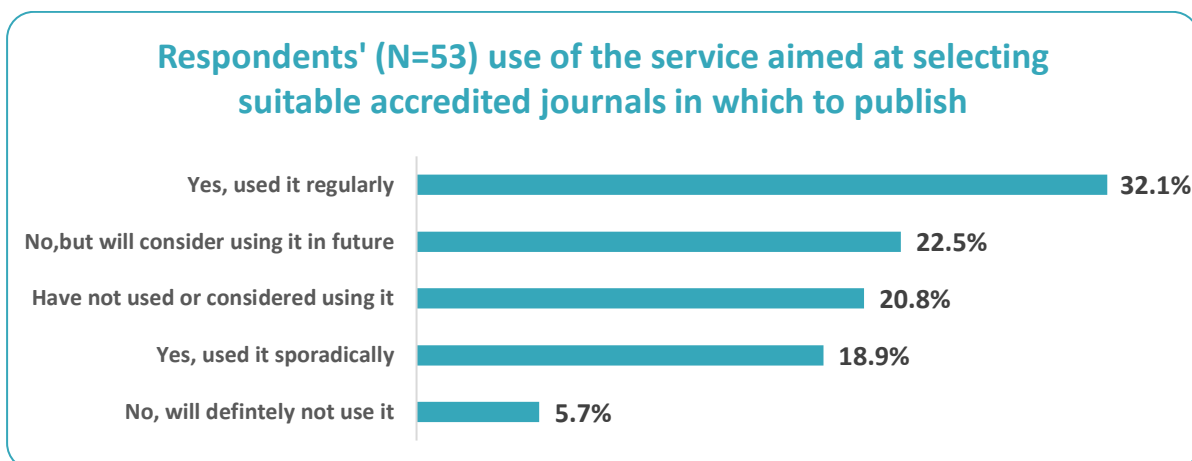


Figure 65: Respondents' use of the service aimed at selecting suitable accredited journals in which to publish

Questionnaire respondents were asked if, in general, they were satisfied with this service. Of the respondents (N=27), 59.3% were very satisfied (59.3%) with this service while 26.9% were satisfied. Although only one (3.7%) respondent indicated a dissatisfied response, this might be an indication for the eRKC to expand and promote this service to ensure client satisfaction. None of the respondents indicated a very dissatisfied response (Figure 66).

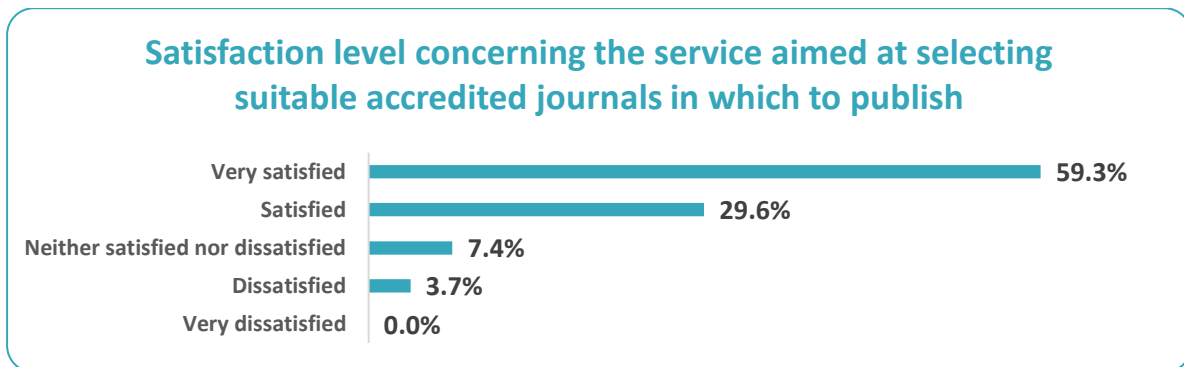


Figure 66: Satisfaction level concerning the service aimed at selecting suitable accredited journals in which to publish

4.2.7.4 Respondents' rating of the importance to their work of raising awareness of open access as a publishing option.

Of the respondents (N=51), 51% rated this service as very important to their work, while 39.2% rated it as important. Of the respondents 3.9% indicated that this service had some importance. These results might be an indication for the eRKC to take the opportunity of showing the value and importance of this service to the HSRC researchers (Figure 67).

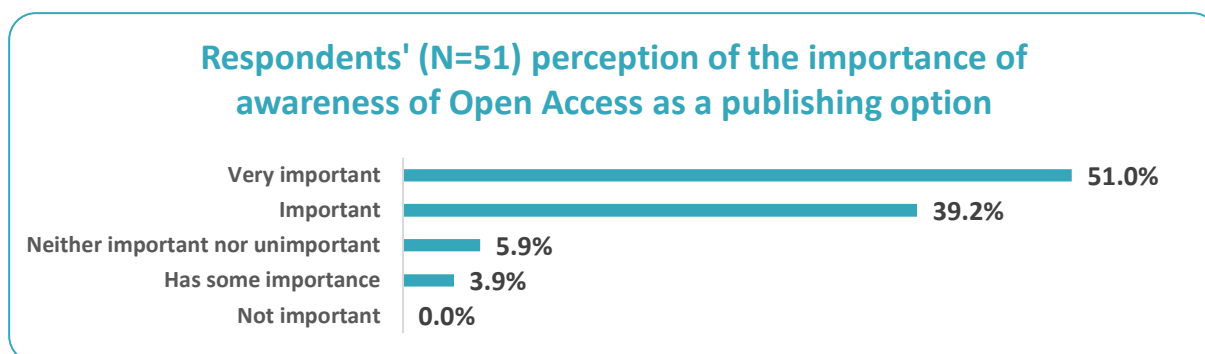


Figure 67: Respondents' perception of the importance of awareness of open access as a publishing option

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=52), 30.8% used this service sporadically, while 13.5% used it regularly. Of the respondents 23.1% had not used or considered using this service, which might indicate that they had not previously needed this service (Figure 68).

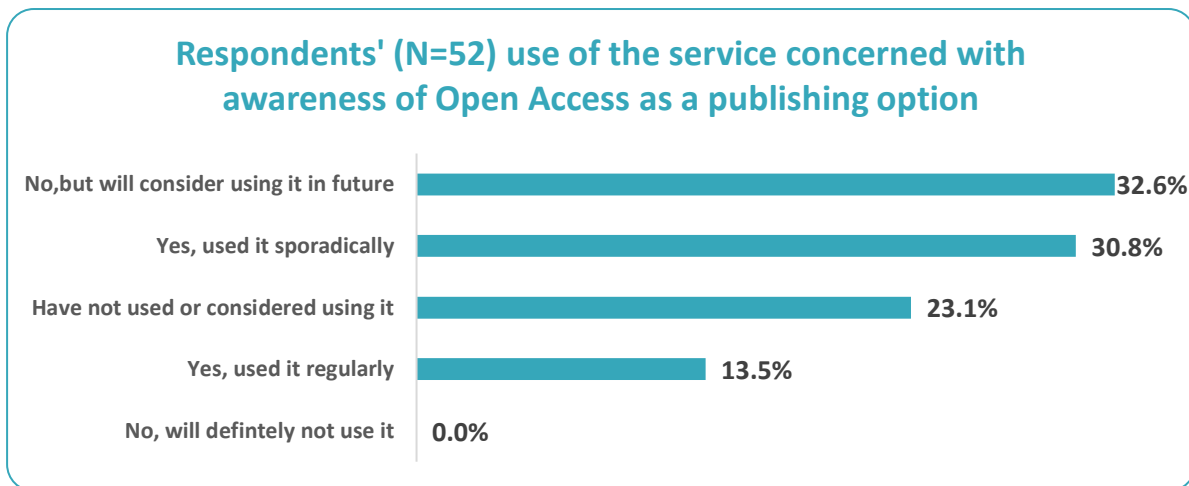


Figure 68: Respondents' use of the service concerned with awareness of Open Access as a publishing option

Questionnaire respondents were asked if, in general, they were satisfied with this service. Figure 69 shows that 37.5% of respondents (N=24) were very satisfied with the service, while 45.8% were satisfied. None of the respondents indicated a dissatisfied or a very dissatisfied response (Figure 69).

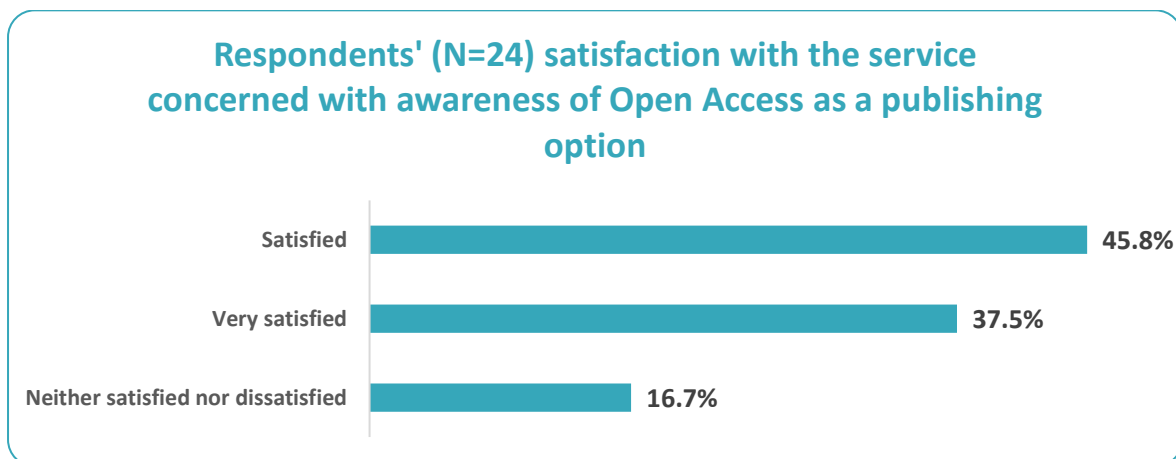


Figure 69: Respondents' satisfaction with the service concerned with awareness of Open Access as a publishing option

4.2.7.5 Respondents' rating of the importance of the article processing charges (APCs) funds within the eRKC

Of the respondents (N=53), 56.6% rated this service as very important to their work, while 24.5% believed it to be important. None rated this service as having some importance. Three responses (5.7%) rated this service as not important (Figure 70).

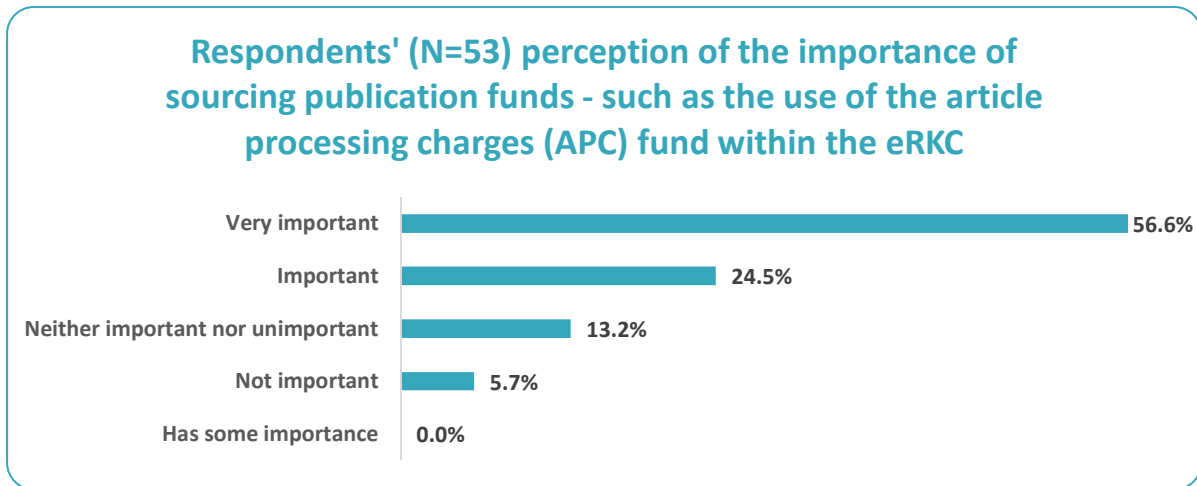


Figure 70: Respondents' perception of the importance of sourcing publication funds – such as the use of the article processing charges (APC) fund within the eRKC

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=52), 23.5% used this service sporadically, while 7.7% used it regularly. Of the respondents 40.4% indicated that they had not used this service but would consider using it in the future. Two (3.8%) respondents indicated that they would never use this service (Figure 71).

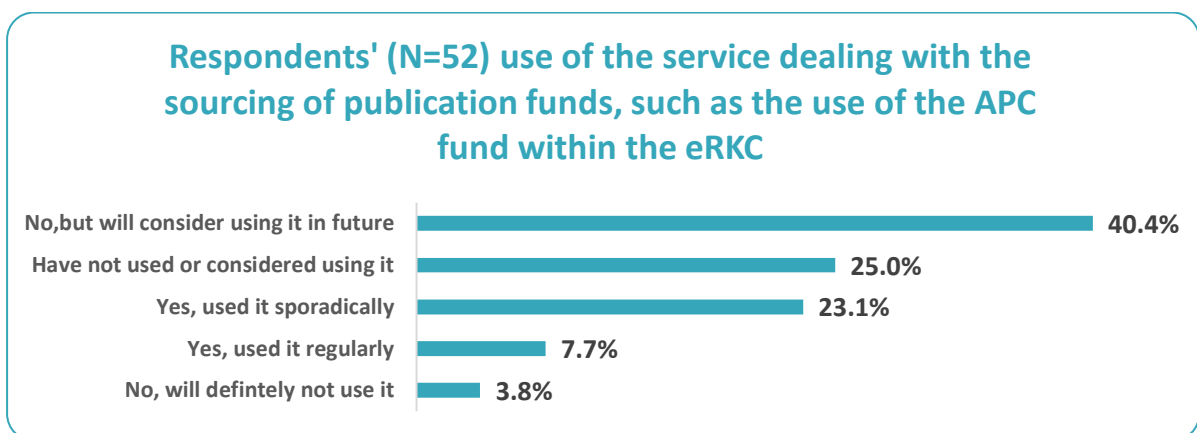


Figure 71: Respondents' use of the service dealing with the sourcing of publication funds, such as the use of the APC fund within the eRKC

Questionnaire respondents were asked if, in general, they were satisfied with this service. Of the respondents (N=17), 52.9% indicated a very satisfied response to this service, while 41.2% were satisfied. None of the respondents indicated a dissatisfied or a very dissatisfied response (Figure 72).

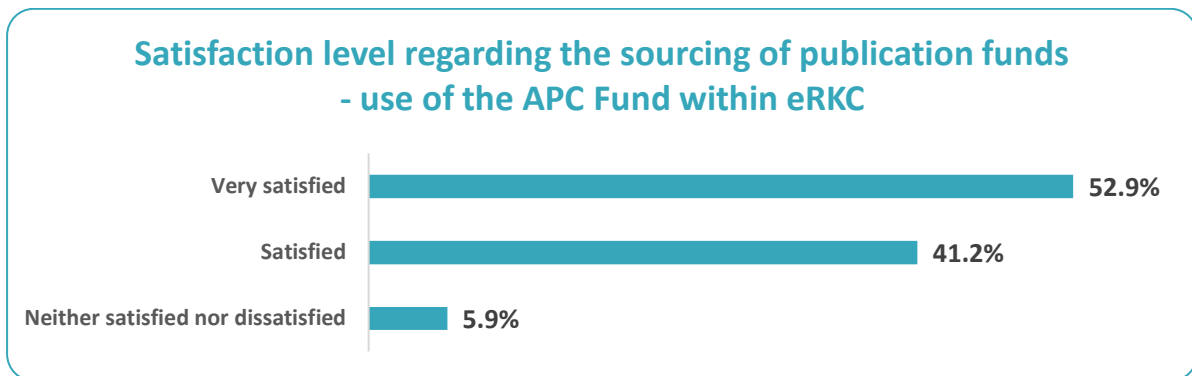


Figure 72: Satisfaction level regarding the sourcing of publication funds – use of the APC fund within eRKC

4.2.8 Research enabling services during the Preserve phase of the research life cycle

4.2.8.1 Development of research output repositories (data and publications) based on best practice curation processes

Questionnaire respondents were asked to rate the importance of this service to their work. Fifty-three respondents rated it as very important in respect of research publications (69.8%) and data sets (64.2%). Only one (1.9%) respondent rated this service as not important to his/her work (Figure 73).

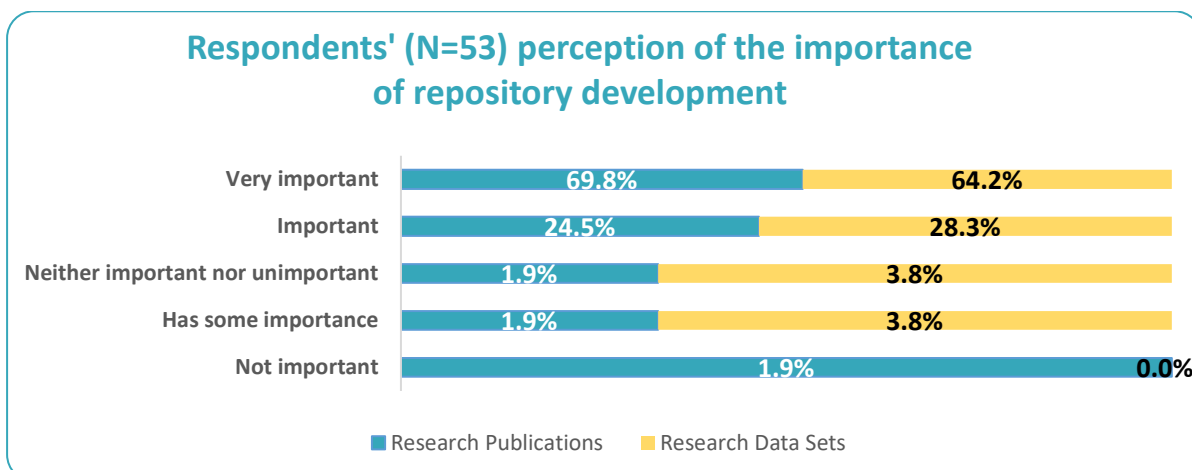


Figure 73: Respondents' perception of the importance of repository development

Questionnaire respondents were asked if they used or had considered using these repository services. Of the respondents (N=53), 98.1% used the research output repositories regularly, while 51% used it sporadically. Only 15.1% of the respondents had not used this service but would consider using it in the future in both the research publications and data sets. None of the respondents indicated that they would not use it (Figure 74).

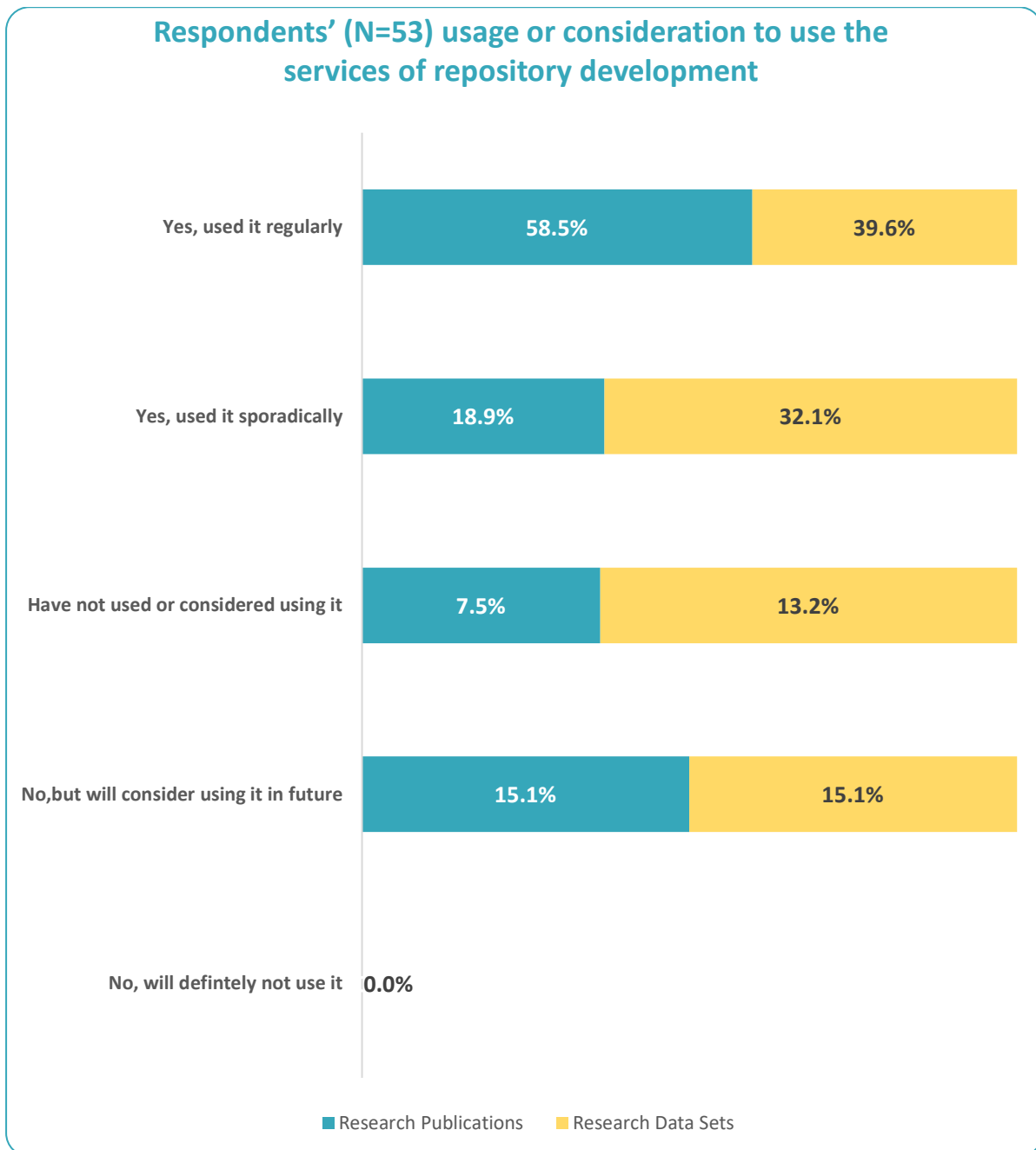


Figure 74: Respondents' usage of the services of repository development

Questionnaire respondents were asked if, in general, they were satisfied with the research publications and data repository services. Of the respondents (N=53), 64.6% were very satisfied with the repository development services, while 86.2% were satisfied. In terms of being neither satisfied, nor dissatisfied, 10 respondents chose this option concerning research publications (19.2%) and fifteen about the data sets (30%). None of the respondents indicated that they were dissatisfied or very dissatisfied with the service (Figure 75).

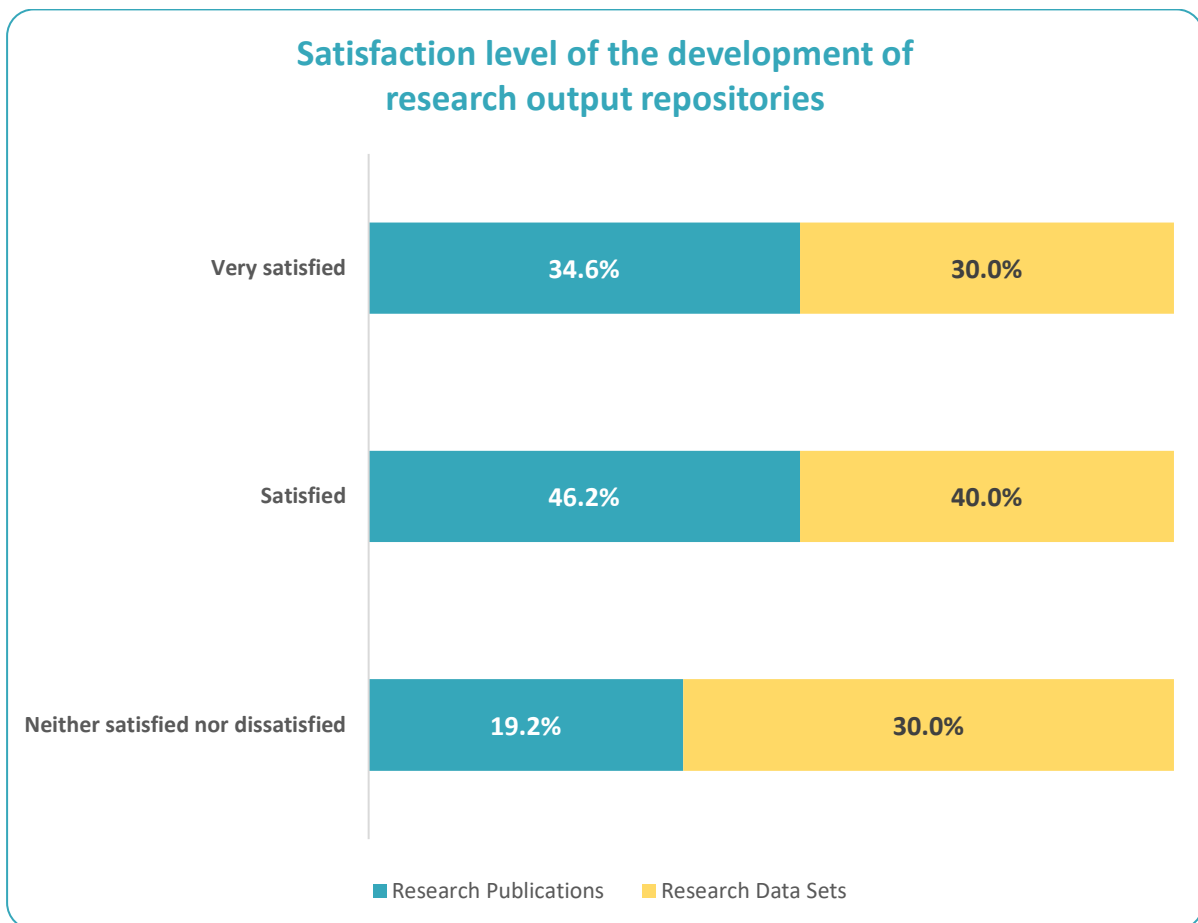


Figure 75: Satisfaction level of the development of research output repositories

4.2.8.2 Creating applicable metadata for successful sharing and harvesting of research output

Questionnaire respondents were asked to rate the importance of this service to their work. Of the respondents (N=51), 41.2% rated this service as very important to their work, while 41.2% rated it as important. None of the respondents indicated that this service had only some importance to their work. Of note are the three (5.9%) respondents who rated this service as not important (Figure 76).

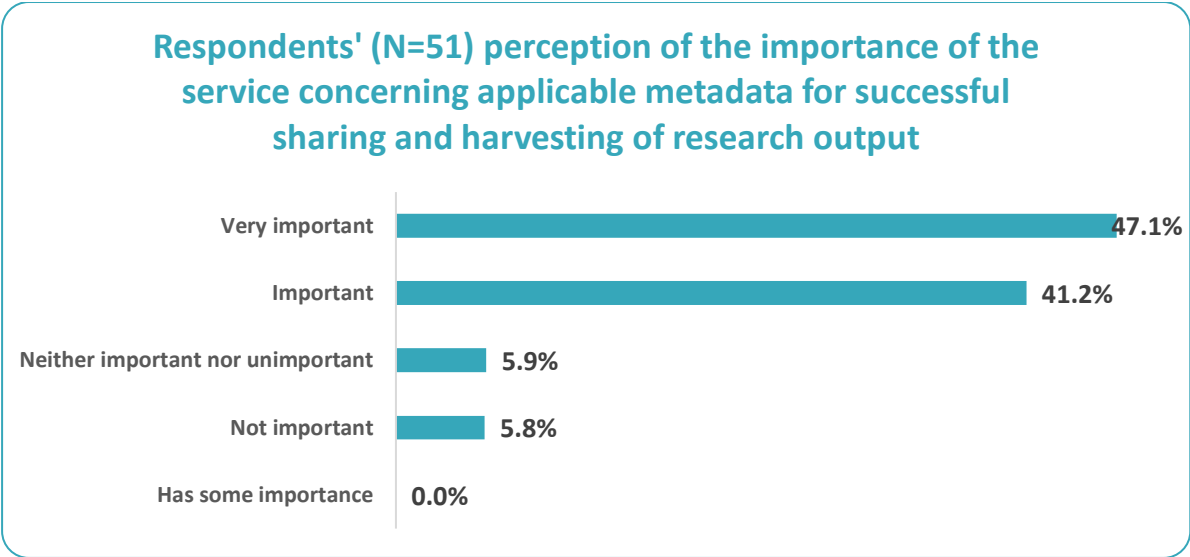


Figure 76: Respondents' perception of the importance of the service concerning applicable metadata for successful sharing and harvesting of research output

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=51), 23.5% used this service sporadically, while 17.6% used it regularly. Of note are the 35.3% of respondents had not used this service but would consider using it in the future as well as the 5.9% who would never use this service. This result might be an indication for the eRKC to expand and actively promote this service to the HSRC researchers (Figure 77).

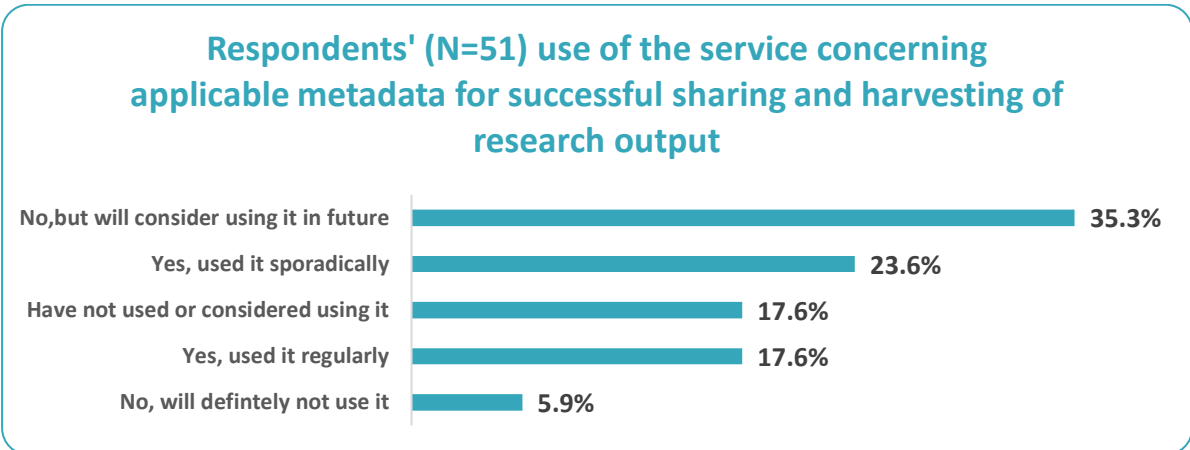


Figure 77: Respondents' use of the service concerning applicable metadata for successful sharing and harvesting of research output

Questionnaire respondents were asked if, in general, they were satisfied with this service. Due to the high percentage of respondents who had 'not used or considered

using this service' (17.6%) and who might consider using it in the future (35.3%), the response rate to this question is lower (N=21). 71.5% were very satisfied with this service. None of the respondents indicated that they were dissatisfied or very dissatisfied with this service (Figure 78).

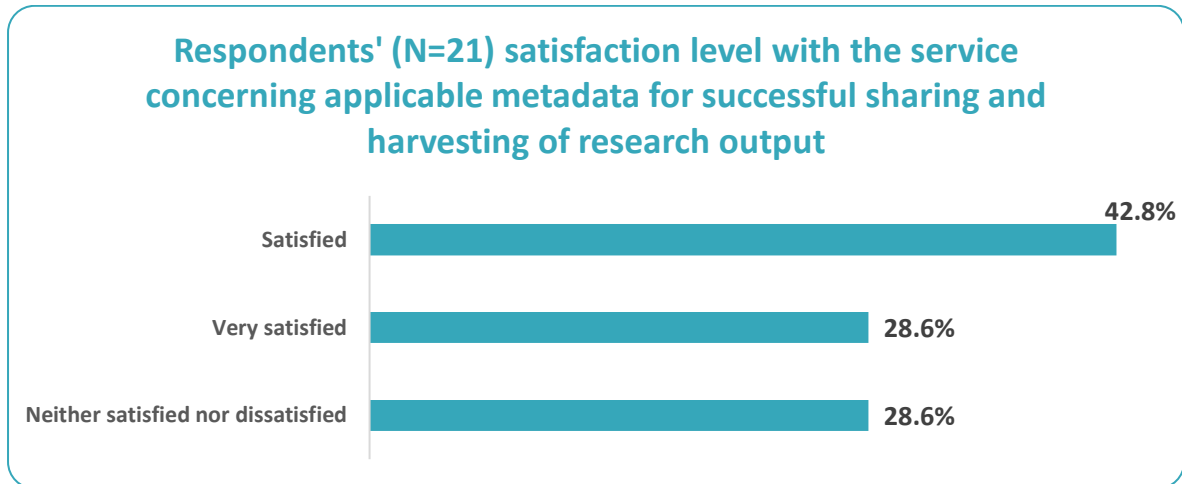


Figure 78: Respondents' satisfaction level with the service concerning applicable metadata for successful sharing and harvesting of research output

4.2.8.3 Long-term preservation of research output

Questionnaire respondents were asked to rate the importance of this service to their work. Figure 79 shows that 41.5% of the respondents (N=53) believed this service to be very important, while 39.6% believed it to be important. None of the respondents indicated that this service was not important.

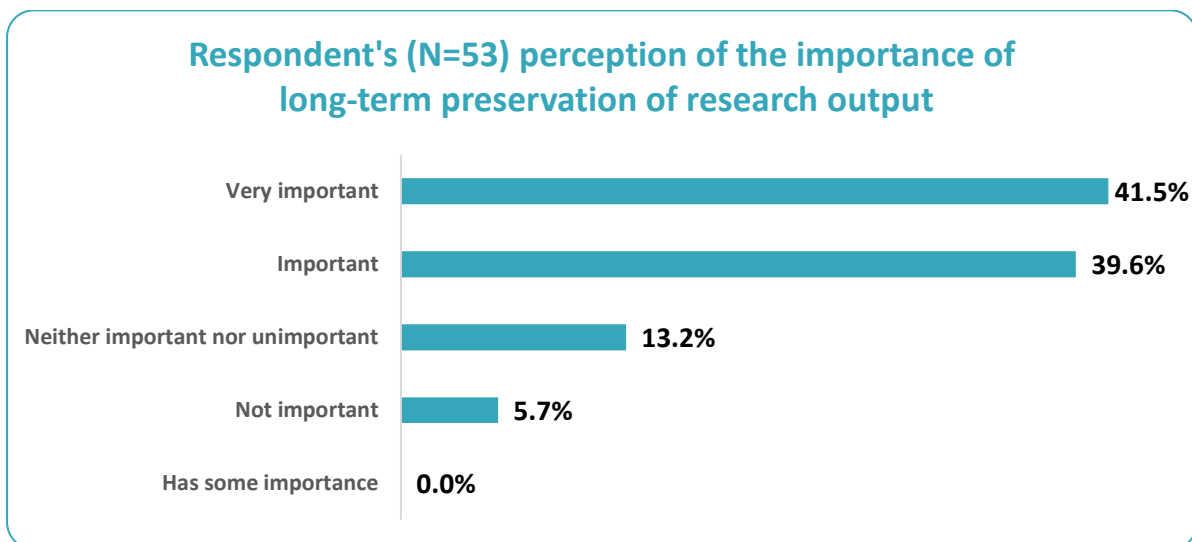


Figure 79: Importance of long-term preservation of research output

Questionnaire respondents were asked if they thought the eRKC should take responsibility for long-term preservation. Of the respondents (N=53), 45.3% believed that long-term preservation of research output should be the responsibility of the eRKC. Only one (1.9%) respondent indicated that it should probably not be the eRKC's responsibility. None of the respondents indicated that it should not be the eRKC's responsibility (Figure 80).

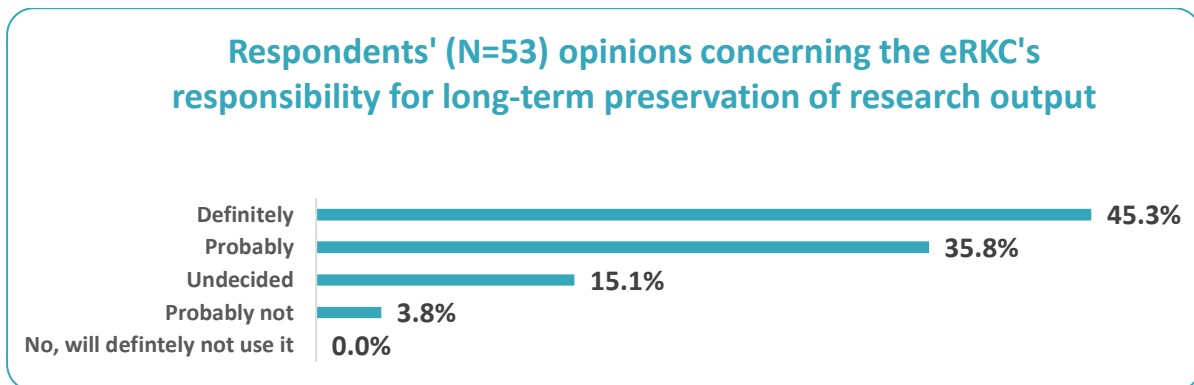


Figure 80: Respondents' opinions concerning the eRKC's responsibility for long-term preservation of research output

4.2.8.4 Promotion of research publications and data sets via the repository, social media, and other platforms

Questionnaire respondents were asked to rate the importance of this service to their work. Figure 81 shows that 62.3% of respondents (N=51) believed that promoting their research output via the repositories, social media and other platforms was very important, while 34% believed it to be important. Only 3.8%, believed that this service was neither important nor unimportant. None of the respondents indicated that this service had some importance or that it was not important.

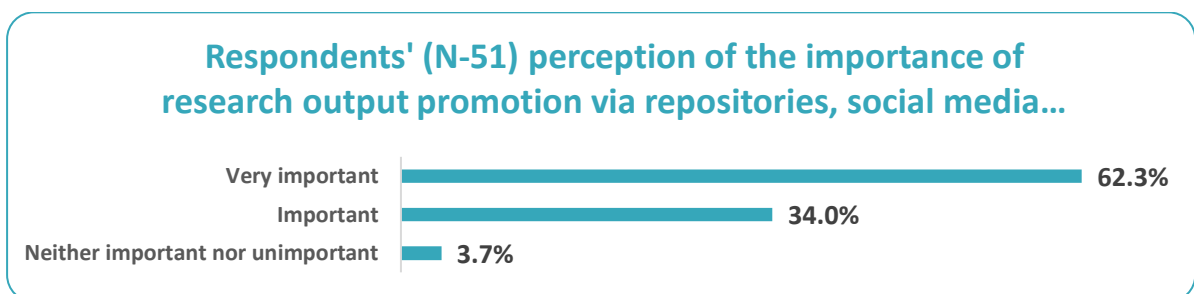


Figure 81: Respondents' perception of the importance of research output promotion via repositories, social media and other platforms

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=52), 28.3% used this service sporadically, while 9.4% used it regularly. Interestingly, 39.6% had not used this service but would consider using it in the future (Figure 82).

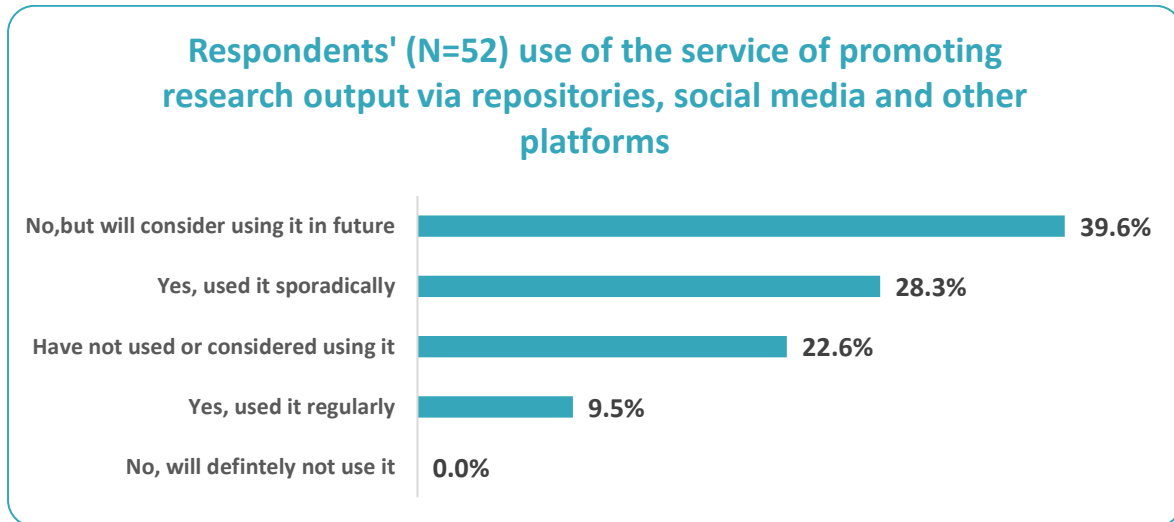


Figure 82: Respondents' use of the service of promoting research output via repositories, social media and other platforms

Questionnaire respondents were asked if, in general, they were satisfied with this service. Of the respondents (N=20), 25% were very satisfied and 40% were satisfied with this service. Of note are the 15% that were dissatisfied with the service. None of the respondents indicated that they were very dissatisfied with the service (Figure 83).

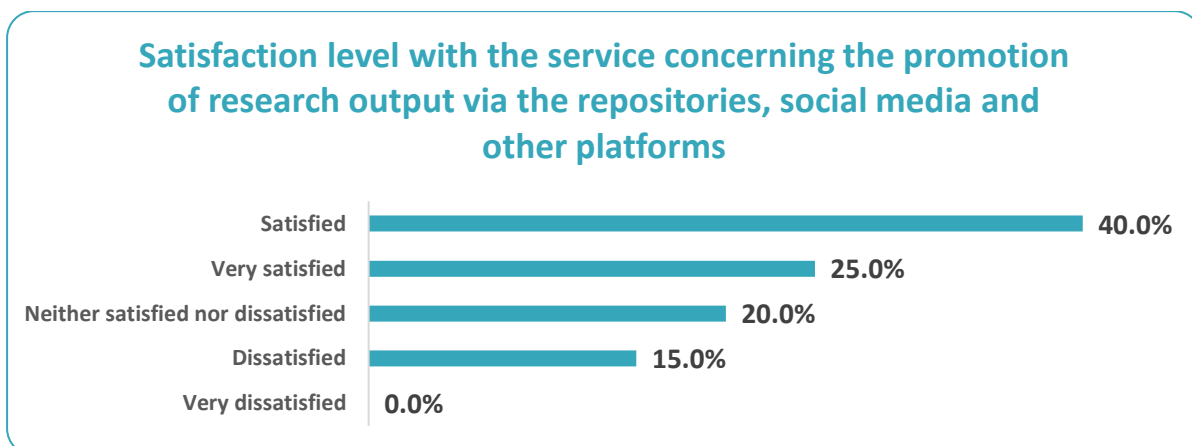


Figure 83: Satisfaction level with the service concerning the promotion of research output via the repositories, social media and other platforms

4.2.9 Research enabling services during the Measure phase of the research life cycle

4.2.9.1 Tracking the impact of research through bibliometric analysis to assist with applications for NRF-rating, funding, and promotions

Questionnaire respondents were asked to rate the importance of this service to their work. Of the respondents (N=53), 56.6% rated this service as very important, while 32.1% rated it as important. None indicated that this service was not important (Figure 84).

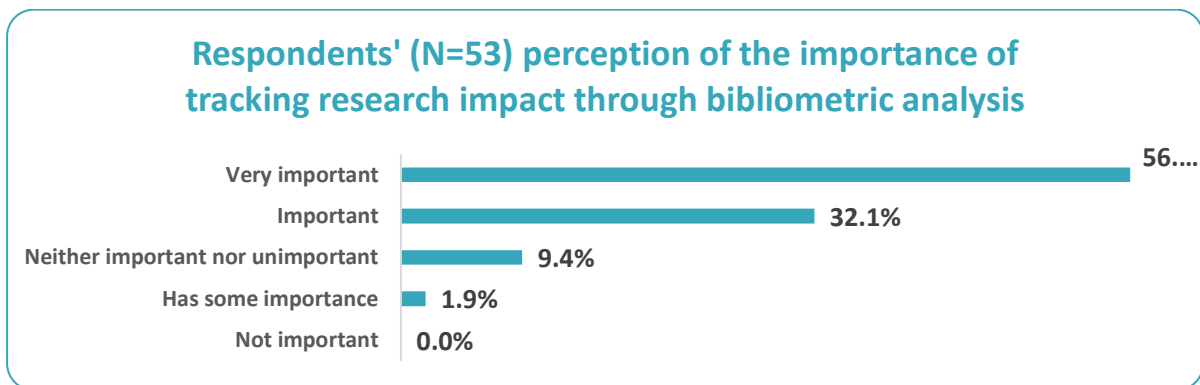


Figure 84: Respondents' perception of the importance of tracking research impact through bibliometric analysis

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=53), 28.3% indicated that they used bibliometric analysis sporadically, while 5.7% used it regularly. Of note, are the 23 (43.4%) who had not used this service, but would consider using it in the future. None of the respondents indicated that they would not use this service (Figure 85).

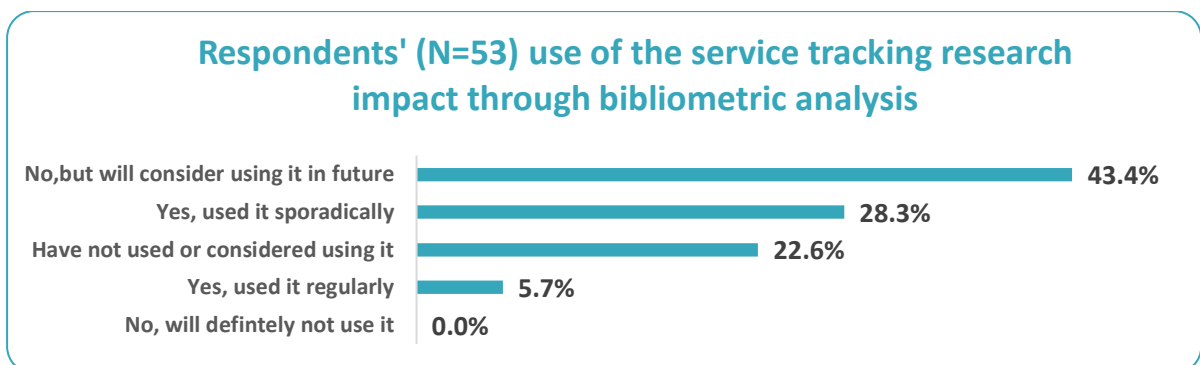


Figure 85: Respondents' use of the service tracking research impact through bibliometric analysis

Questionnaire respondents were asked if, in general, they were satisfied with this service. Of the respondents (N=18), 50% indicated a very satisfied response, while 38.9%) were satisfied. None of the respondents indicated that they were dissatisfied or very dissatisfied with this service, which is a positive outcome the eRKC might wish to take note of (Figure 86).

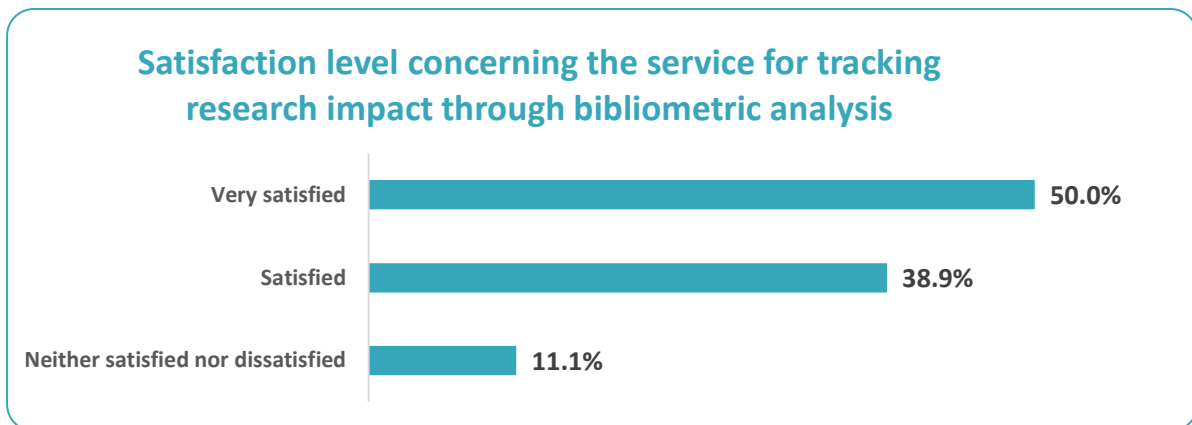


Figure 86: Satisfaction level concerning the service for tracking research impact through bibliometric analysis

4.2.9.2 Tracking research impact through Altmetrics to determine the societal impact.

Questionnaire respondents were asked to rate the importance of this service to their work. Of the respondents (N=53), 47.2% rated this service as very important, while 39.6% believed it to be important. None thought that this service was not important (Figure 87).

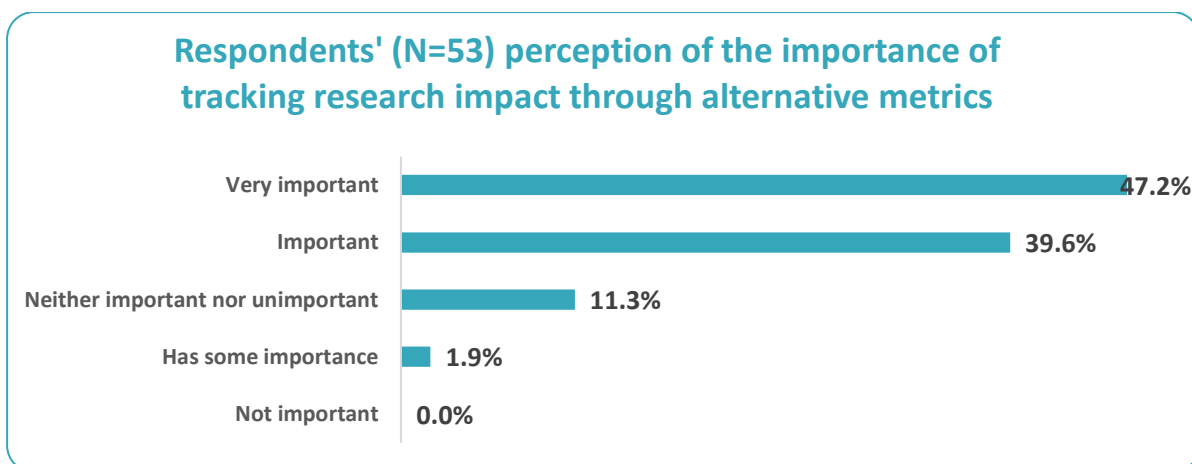


Figure 87: Respondents' perception of the importance of the service tracking research impact through alternative metrics

Questionnaire respondents were asked if they used or had considered using this service. Of the respondents (N=53), 5.7% indicated that they used this service regularly. Of note is the 60.4% who had not used this service, but would consider using it in the future. None of the respondents indicated that they would not use this service. (Figure 88).

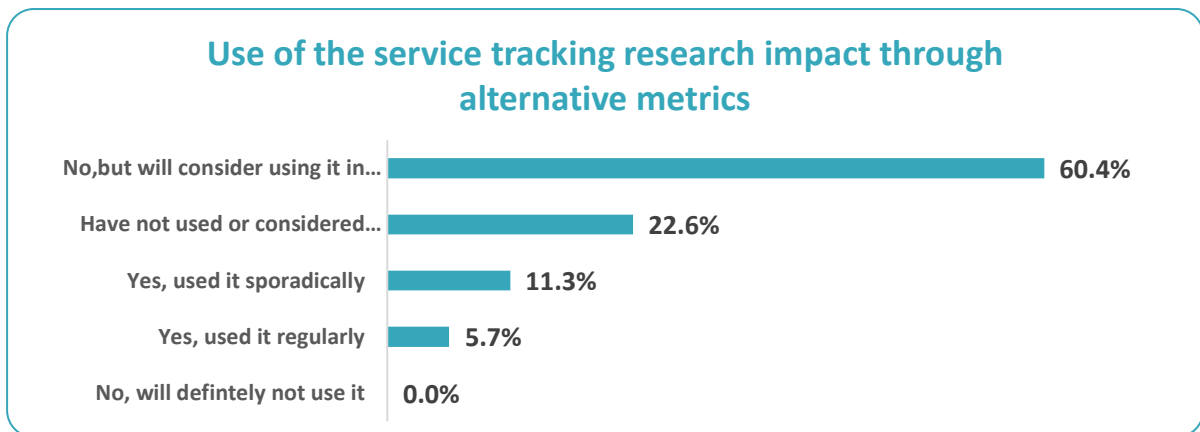


Figure 88: Use of the service tracking research impact through alternative metrics

Questionnaire respondents were asked if, in general, they were satisfied with this service. Of the respondents (N=9), 55.6% indicated that they were very satisfied, while 33.3% were satisfied. None of the respondents indicated that they were dissatisfied or very dissatisfied. This is a positive outcome that the eRKC might wish to take note of (Figure 89).

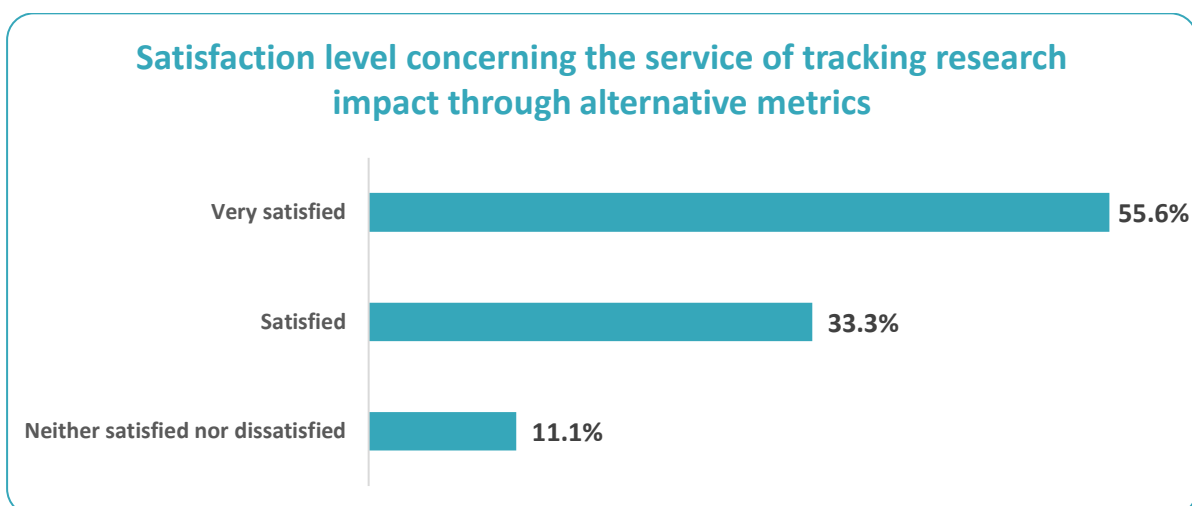


Figure 89: Satisfaction level concerning the service of tracking research impact through alternative metrics

4.2.10 Respondents' level of confidence in the eRKC staff

Overall, 52.8% of respondents had full confidence that the eRKC staff are sufficiently knowledgeable to assist with any relevant enquiries and that they keep abreast of new technologies and products, while 39.6% were somewhat confident in the eRKC staff.

Six (11.3%) indicated that they were neither confident nor unconfident. One (1.9%) showed little confidence in the eRKC staff, while one (1.9%) stated that they had no confidence in the eRKC staff at all (Figure 90).



Figure 90: Confidence level in the eRKC staff

4.2.11 Respondents' eRKC-related suggestions or comments that might add value to this study

Twenty-four responses were received. Five (20.8%) are not reported here as the responses included comments such as N/A, none or could not be interpreted. A further two responses (8.3%) believed the survey to be very comprehensive and indicated that all items were covered. In the words of one respondent, "eRKC plays a vital role in the HSRC's 'research ecosystem'. This research project is therefore very important to inform reflection on eRKC effectiveness in serving the needs of the HSRC". The remaining 17 (70.9%) responses are applicable and could be interpreted as opportunities for the eRKC to reflect on or improve its service delivery.

The suggestions and comments received can be divided into five areas:

1. Awareness of the eRKC's services and support offerings

The bulk of the comments and suggestions received from respondents dealt with the raising of awareness and the need for actively marketing new services, with one respondent suggesting that he or she had had no orientation at all around the purpose and services of the eRKC. Another respondent was typical of the respondent group in saying that "more awareness of the eRKC's services will be very useful," continuing that he/she "was unaware of some of the services mentioned in this survey, for example, Altmetrics".

One of the respondents said:

I think eRKC staff should be more proactive in reaching out to senior HSRC staff and explaining what support services they can offer. eRKC is a distinctive service not available to researchers in universities, but HSRC researchers don't make full use of it. Senior research staff are extremely busy and don't read every email sent to them by eRKC and other units.

The same respondent went on to suggest that the eRKC might consider visiting or phoning researchers and asking how they might be of assistance.

The idea of the eRKC having a direct link to library services on the main HSRC internet and intranet landing pages to facilitate quick access was raised by one of the respondents.

2. Analysis of HSRC data and building capacities to do so within the HSRC

A single comment was submitted here, with the respondent concerned saying:

[O]ne nascent 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.

3. Tracking societal research impact

Respondents were keen to know how the HSRC's impact could be measured, with one suggesting that the eRKC could:

“...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 on the social and economic dynamics of communities.”

This was echoed by the words of another respondent who asked, “How does eRKC link to the impact centre services and mandate?” It was also suggested that support by way of promoting research publications and data sets via the repository, social media and other platforms would be appropriate.

4. Data Curation processes and accessibility of data sets

The respondents identified the need to maintain up-to-date data and to store data for the long-term by creating DOIs. One respondent suggested that “support is required for the eRKC to take over most of the data curation processes as this is extremely time-consuming for researchers”. Creating applicable metadata for the successful sharing and harvesting of research output was suggested by a respondent as being necessary.

5. Journal accreditation and publications

One respondent commented on this topic that “[the] eRKC has always been the most helpful when I need assistance with publications and accreditation of journals to use for publication”.

The results are reflected in Figure 91.

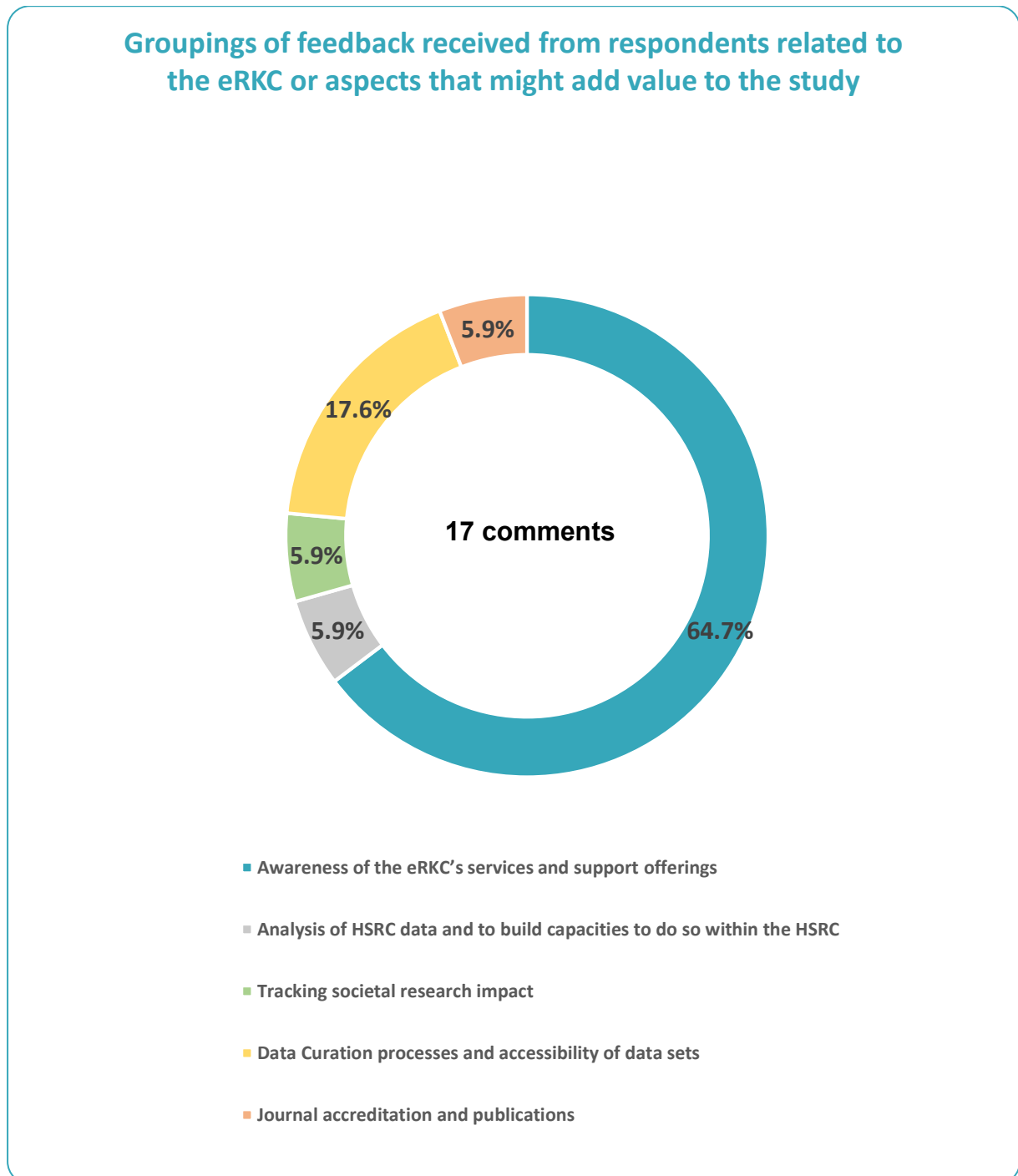


Figure 91: Groupings of feedback received from respondents related to the eRKC or aspects that might add value to the study

4.3 Qualitative findings: interviews

4.3.1 Introduction

This section reports the results of the qualitative findings obtained through the individual interviews with selected eRKC staff. The structure of the interviews was used to report the order of the findings obtained from the interviews. The individual interviews aided in comparing the possible differences and similarities in the support needs of the HSRC researchers, holding them up against the perceptions of the eRKC staff. In addition, the interviews assisted in determining the strengths and gaps in the eRKC' s support offering to the HSRC researchers.

4.3.2 Structure of the interviews

The individual interviews were designed as semi-structured interviews guided by the six research life cycle phases as adopted for this study. These phases include the Prepare, Gather, Create, Share, Preserve and Measure phases.

The interview consisted of 22 questions divided between the different stages of the research life cycle. Sub-questions formed part of the main interview questions and referred to the relevant activities within the main stages of the research life cycle. A detailed presentation of the sub-categories is listed from 4.3.4 onwards.

There are currently 22 staff members employed at the eRKC. For this study, three staff members from each of the three eRKC sub-units (for a total of nine) were purposefully selected to participate in the interviews. This breakdown was chosen as each of the three subunits is responsible for specific support services and the intention was to look at a spectrum of the services offered within each of these sub-units. Although the selected staff members' qualifications varied vastly, they were hierarchically on a similar level. The director and sub-unit managers were not included in the selection. Each selected interviewee provided support to the HSRC researchers daily in their specific unit and role.

A total of nine interviews were facilitated by the researcher and took place between Thursday 17 March and Wednesday 10 April 2022 (Appendix F). The interviews were voluntary and all of the interviewees voiced their opinions freely and participated

enthusiastically in the interview. Each interview lasted one hour and 15 minutes and was recorded in its entirety (Appendix B).

4.3.3 Findings to questions asked during the interviews

A total of nine interviews took place, three with Information Services staff, three with Digital Scholarship Services Staff and three with Geospatial Analytics staff. Of the nine interviewees completed, 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 of the staff holding library or information science qualifications, as might usually be expected within a library environment. Nonetheless, all of the qualifications were appropriate in terms of the expectations of the interviewees in their specific roles within the eRKC.

In the second section, the interviewer presented a short overview of the study and explained in more detail to the interviewees the research life cycle as the theoretical framework adopted for this study. This was necessary so that they would understand how the eRKC services were assigned to the various phases of the research life cycle and also understand the structure of the interview.

The interview questions were structured according to the phases of the adopted research life cycle with sub-questions about the services linked with the activities within each of the phases.

4.3.3.1 Research enabling services during the Prepare phase

Activity 1.1: Rating the importance of environmental scanning to researchers

The majority (8) of interviewees thought this service to be very important to researchers. One interviewee believed this service to be important to a certain extent.

Reasons provided 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 (interviewees # 1, 2, 3, 4, 5, 7 & 8).

Interviewee 6 had the following comment: “It is vital to researchers because, when you look at the role of the HSRC in the country, this service is important to enable research that benefits the society”. This comment is very much related to the HSRC’s mandate and makes this an important indicator of the importance of this service.

Another comment also indicates the importance of environmental scanning to researchers: “It guides the researcher as to what is happening on the ground and not to duplicate studies”. This suggests that not only does this service provide background information to the researchers on their topic, but it also assists in avoiding duplication of studies to ensure original high-quality research (Interviewee # 9).

Rating the quality of this service, provided by eRKC, to researchers

Most interviewees (7) answered yes, in that they 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. Interviewee 5 had the following comment: “ICs play a crucial role in selecting journals, as part of the journal evaluation process, to ensure the journals fit in with the research topics of the HSRC”. In addition, Interviewee 6 commented on the close relationships that ICs have with the researchers and that they are “capable [of providing] excellent guidance and advice”. Interviewee # 8 mentioned that it is one of the requirements of being an IC to register for alerts on every journal that the HSRC subscribes to, thus ensuring that the researchers receive up-to-date information on trends in their field.

Three interviewees mentioned that, from their personal experience, they had not received enough information on a topic of their choice and that there were shortfalls that could be improved upon (Interviewees # 3 & 7). Interviewee # 8 believed the service could be better and that the existing limited resources could be improved upon.

This might be an indication for the eRKC to follow up when they provide this service to ensure client satisfaction and it might also be an indication for the eRKC to address the issue of limited resources.

Activity 1.2: Rating the importance of spatial consultation and conceptualisation of a research topic to researchers

eRKC staff that were interviewed believed this service to be important (Interviewees # 4, 5 & 6), quite important (Interviewee # 8) and very important (Interviewees # 7 & 9). Interviewee # 5 responded to this question as follows: “spatial conceptualisation puts research in context and explains the reality of space we work in”. Another response received was: “we live in different areas; therefore, our geographies and style of living are not the same and this service is essential to ensure all these areas are covered”. Another interviewee, # 9, stated that “Geotargeted interventions are needed”.

Three interviewees indicated that the importance of this service depended on the research project and the area of study (Interviewees # 1, 2 & 3). Spatial conceptualisation is not necessary for every project, according to these interviewees.

Rating the quality of this service, provided by eRKC, to researchers

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 of the interviewee responses and this unit was deemed to be dedicated, very experienced, very 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 (Interviewee # 7), while Interviewee # 9 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.

Activity 1.3: Rating the importance of identifying research funding opportunities to researchers

The question was answered with an overwhelming ‘yes, very important by all nine of the interviewees. The majority repeated the ‘no funding, no research’ observation. Interviewee # 2 commented that this service “should be a top priority”, whereas both Interviewees # 3 and # 4 believed that this service was necessary to broaden the

researcher's skills and for collaboration. Finding research funding opportunities was, according to Interviewee 6, the "driving force for research. No funding opportunities equals no quality research and therefore researchers cannot succeed in societal impact".

Rating the quality of this service, provided by eRKC, to researchers

Four interviewees responded that they did not know if the eRKC provided this service, while a further four indicated that it was provided at a high standard. Interviewee # 6 thought that the eRKC might provide this service at a high standard, as the ICs send out communication about funding opportunities. One response, from Interviewee # 4, 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 # 8 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 same point, Interviewee # 5 commented that another unit in the HSRC had taken over the operation of Research Professional and that the eRKC was no longer using it.

Activity 1.4: Rating the importance of training and orientation workshops on the services provided by the eRKC are to researchers

All the interviewees believed that attending the eRKC-hosted orientation and training workshops should be very important to researchers. Most of the responses mentioned the fact that these workshops are important as they provide researchers with an overview as well as 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.

Interviewee # 2 said: "They won't know what we can offer and what they need," when not attending these workshops. A comment by Interviewee # 3 stating that "attending training sessions determines the usage of our services" was especially interesting.

Interviewee # 7 mentioned that, if researchers attend these training workshops, data errors could be minimised and that this would prevent headaches when the curation has to be done. 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 more 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 very important to researchers, but that for some reason, they don’t think it is important. The same interviewee continued that this was evident when these workshops are advertised and the eRKC goes to so much trouble travelling to all the offices, creating marketing materials and so on. and very few people attend. This interviewee suggested a digital portal that would be free and easy to navigate so that researchers would be able to get the workshops they need.

4.3.3.2 Research enabling services during the Gather phase

Activity 2.1: Rating the importance of having access to useful and high-quality information resources for researchers

All the interviewees indicated that they believed access to useful and high-quality information resources is very important to 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.

Interviewee # 6 mentioned that access to useful and high-quality information resources is essential to drive research findings.

In the words of Interviewee # 7, “all useful and high-quality information resources impact on time and ensure better research results”.

Not only does access to useful and high-quality information resources ensure better research results, but according to Interviewee # 9, it also creates a high calibre researcher who will be up to date with trends in these fields/topics.

Rating the quality of this service, provided by eRKC, to researchers

All nine interviewees indicated that the eRKC does deliver a high standard of access to useful and high-quality information resources.

The majority indicated that the eRKC subscribes to core journal packages of high value. The portal that includes various databases was seen as useful, up to date, and as being renewed when due.

Interviewee # 5 mentioned the usage reports managed in the Information Services unit and how using these reports makes it possible to track the downloads from all the databases and to spot the gaps by looking at the 'denials' reported.

The print collection and repositories for data and publications were also mentioned as valuable resources.

Interviewees # 6, 7 and 9 expressed their support for the Information Consultants (ICs) who go beyond the call of duty to find information, even where the relevant subscriptions are not held.

Activity 2.2: Rating the importance to researchers of data management planning and completing a DMP

Eight of the interviewees believed that this service is very important to researchers. The majority listed reasons such as having a plan, avoiding data errors and proper data management planning. Interviewee # 8 noted that "researchers need it. They don't know what to do with their data". Interviewee # 9 stated that "adhering to the plan will ensure data that is scientifically correct. This interviewee further commented that proper data management planning is essential to avoid the well-known 'garbage in, garbage out' effect.

Interviewee # 1 made the following comment "carefully structured data management plans can account for good results". This result might be an indication for the eRKC to look at the structure of the current Data Management Plan that is available to researchers.

Only one interviewee was not sure whether guidance on data management planning is important to researchers.

Rating the quality of this service, provided by eRKC, to researchers

Four interviewees, # 5, 6, 8 and 9, 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, #1 and 4, responded by saying they were not sure if the eRKC provided this service.

Two interviewees felt that the eRKC could improve on this service. “The eRKC only provides an entry-level service,” Interviewee # 2 stated. Interviewee # 7 added, “We do a good job but are not fully invested in it, we can do better.”

The above results might indicate that the eRKC should expand and promote this service to the HSRC researchers.

Activity 2.3: Rating the importance to researchers of reviewing data management plans as part of the ethics application process

Six interviewees, # 2, 4, 5, 7, 8 and 9, believed that this service was very important to researchers. Some of the reasons mentioned for this importance include avoiding ethics issues and problems later in the study and adhering to ethics is needed when applying for funding.

Interviewee 1 thought that this service was crucial to researchers and, in his words, “ethical conduct must be echoed throughout all of the research processes, for example, data anonymisation”. Another interviewee, # 3, also thought this service to be crucial to researchers and noted that reviewing these DMPs “enforces compliance and standards within the organisation. The DMP will assist in creating good quality data and how to manage it.”

Lastly, Interviewee # 6 mentioned that the guidance that the eRKC provides in this regard can promote the HSRC’s business. These results might be an indication for the eRKC to keep up the high level of service delivered to ensure future client satisfaction.

Rating the quality of this service, provided by eRKC, to researchers

Only four interviewees, # 2, 3, 7 and 9, believed that 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 good quality data would be deposited for curation.

Interestingly, the remaining five interviewees were not sure whether or not this service was provided at a high standard which might indicate that they did not have much awareness of this service being offered.

Activity 2.4: Consultations and support in the collection of field data

Rating the importance to researchers of consultations and support in collecting field data

Seven of the interviewees stated that the service was very important to researchers. In the words of Interviewee # 2, “Most errors happen in the field. By providing support, errors can be limited and fixed in time for data collection.” Interviewee # 9 thought that GIS was very important to show areas to visit in a project, adding that “old images of rural areas are not accurate and need GIS support.” According to Interviewee # 7, the importance of consultations and support in collecting field data varies according to the project concerned. The reason he provided for this opinion was that, where the service is needed, it can help with limiting data errors. Interviewee # 5 did not believe that this was an important service for researchers, but that their geospatial analytics team would probably be better positioned to answer this question.

Rating eRKC awareness of services to researchers on consultation and support in collecting field data

Eight of the nine interviewees indicated that they were aware that the eRKC provides this service. A majority of the eight who answered in this way also mentioned that they were aware of the geospatial analytics team doing these consultations. One of these interviewees (Interviewee # 7) mentioned that digital scholarship services are also engaging in consultations, but not always successfully. A single interviewee (Interviewee # 8) stated that she was not aware that this service was offered by the

eRKC and was under the impression that field data collection was exclusively the province of the unit concerned.

Rating the quality of this service, provided by eRKC, to researchers

A majority of the interviewees were uncertain (Interviewees # 5, 6 & 7) as to whether the eRKC provides a high-quality service in this regard, while two interviewees (Interviewees # 2 & 8) did not answer the question. Interviewee # 3 characterised the service as being “partly” a high-quality service. Three of the interviewees (Interviewees # 1, 4 & 9) agreed that the service provided was a high-quality one, though with the following rider from Interviewee 9: “[The] eRKC is there, although not always from start to finish.”

4.3.3.3 Research enabling services during the Create phase

Activity 3.1: The importance of clarifying copyright and intellectual property rights to researchers

Seven interviewees (# 1, 2, 3, 4, 5, 8 & 9) believed the service of clarifying copyright and intellectual property rights to be very important to researchers. Reasons to support their opinion include the importance of their contributions and understanding the rights of what you can do with the publication (Interviewee # 1), protecting your work (Interviewee # 3) and not signing away your copyright unnecessarily (Interviewee # 4). Interviewee # 2 indicated that the service of clarifying copyright and intellectual property rights “determines how you can share and re-use research output”. Interviewee # 8 believed that not knowing about copyright and Intellectual property rights, can lead to infringement and publishing in predatory publications. Interviewee # 9 concurred with Interviewee # 8.

Interviewee # 5 stated that, “If you don’t know your rights in terms of your research output you open yourself to legal action and this could negatively impact the researcher and the research organisation.”

Rating the quality of this service, provided by eRKC, to researchers

Three interviewees (1, 2 & 3) indicated that they were uncertain as to whether the eRKC provides this service of clarifying copyright and intellectual property rights at a high standard.

Interviewees # 5 and 8 both believed that the eRKC does not provide this service and that all legal matters should be referred to the Intellectual Property Office or Legal Services as the eRKC are not experts in legal matters.

Interviewee # 7 indicated that she believed that the eRKC provides a high-quality service only in regard to the research publications and data sets, while the clarifying of rights is left to Legal Services.

Three interviewees (# 4, 6 & 9) believed that the eRKC is providing high-quality service in this regard. Interviewee # 4 indicated that he attended a workshop on Responsible Authorship where eRKC colleagues presented on issues of copyright and intellectual property rights. Interviewee # 6 voiced the fact the Information Consultants are very knowledgeable about identifying copyrighted resources and know when these resources may be shared or not. Interviewee # 9 stated that this service was not the main focus of the eRKC, and that the unit mostly refers these types of issues to Legal Services or the Intellectual Property Office. In his opinion, “we can do more in this regard”.

Activity 3.2: Rating the importance of guidance on citation styles, citations and references to researchers

All nine interviewees indicated that guidance on citation styles, citations and referencing is very important to researchers. The majority mentioned that it is important that references and citing's are done properly and consistently and to give credit where it is due as the reasons for their answers.

Interviewee # 5 mentioned the importance of citations to avoid plagiarism. In her words “using a standardised method ensures completeness”. Interviewee # 6 mentioned that referencing and citations are key points for any researcher. In her words “different

sources are referenced differently and to give credit to the sources correctly you need to understand the different styles and know how to use them.”

Interviewee # 8 mentioned the fact that using a referencing tool provides direction with a bibliography and saves time. Interviewee # 4 stated that this activity is a skill every researcher should learn.

Rating the quality of this service, provided by eRKC, to researchers

The majority of interviewees (# 2, 3, 5, 6, 7, 8 & 9) believed that the eRKC provides a high-quality service in terms of citation styles and reference management. They all 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 Information Consultants who are knowledgeable on reference management and who play a big role in the awareness of and training on how to use a reference manager. In the words of Interviewee # 7 “they are doing an awesome job”.

Two interviewees (# 1 & 3) were not sure whether the eRKC provided this service at a high standard.

Activity 3.3: Rating the importance to researchers of guidance on plagiarism

All nine interviewees indicated that guidance on avoiding plagiarism is a very important service to researchers. Reasons, such as unethical conduct and reputation damage for the researcher and the research organisation were noted. In the words of Interviewee # 2, “plagiarism is questionable and influences the integrity of the researcher”. Interviewee # 4 mentioned how unethical plagiarism is and how it could negatively affect the researcher’s career. In the words of Interviewee # 8, “plagiarism has legal implications” and Interviewee # 1 said, “they just shouldn’t do it!”.

Rating the quality of this service, provided by eRKC, to researchers

One interviewee # 3 was not sure whether the eRKC provided a high-quality service in this regard.

The remaining eight interviewees believed that the eRKC provides a very good service to researchers in this regard. Most interviewees mentioned the tool iThenticate, which

provides a good similarity report for researchers to avoid plagiarism. In the words of Interviewee # 4, “the eRKC does an excellent service with very good turnaround times with iThenticate reports”. Interviewee # 5 mentioned that iThenticate is used optimally and very well marketed, while Interviewee # 8 also mentioned that it is used very much by research staff and also by the HSRC Press.

Most of the interviewees mentioned that the training the Information Consultants provide on the use of iThenticate is of high quality and very useful. One interviewee, # 2, thought that the use of iThenticate is not emphasised enough and the eRKC should do more to create awareness.

4.3.3.4 Research enabling services during the Share phase

Activity 4.1: Rating the importance to researchers of professional information being updated on platforms such as ORCID

Eight interviewees indicated that this service is very important to researchers. This type of platform creates more visibility or exposure for the researcher and assists in the re-use, sharing and citing of their work.

Interviewee # 4 mentioned that “this is of utmost importance to researchers to track their work but also to see the work of others”. Interviewee # 5 stated that “if these profiles are updated it assists in finding collaborations and other experts in the field”.

In the words of Interviewee # 6, “authors have the opportunity to advise the host how they want to be known which is crucial for updated authority records”. Interviewee # 9 also indicated the importance of ORCID for NRF ratings. In his words, this activity is important to “assess the calibre of the researcher”.

Only one interviewee noted that she was not sure if this service was important to researchers and whether they would want it.

Rating the quality of this service, provided by eRKC, to researchers

Five interviewees (# 4, 5, 6, 8 & 9) believed that the eRKC provides a high-quality service of updating the professional information of researchers on platforms such as ORCID. The Information Consultants were again mentioned as big role players in creating awareness and training researchers on these platforms. Interviewee # 9

indicated that more workshops are necessary in this regard and that the eRKC should raise awareness amongst researchers so that they would take this activity seriously. Interviewee 6 mentioned that, although the eRKC provides a good service, there is room for improvement. She specifically mentioned the inconsistencies that exist between author profiles in Scopus, Google Scholar and ORCID.

Interestingly, four interviewees (# 1, 2, 3 & 7) were not sure whether the eRKC provided this service at a high standard. This again might be an indication for the eRKC that all their staff are not aware of the services that are on offer to researchers and that they might wish to create more awareness within the unit as well as among HSRC researchers.

Activity 4.2: Rating the importance to researchers of Creative Commons licensing

Two interviewees (# 1 & 4) were uncertain whether this service was important to researchers. The remaining seven interviewees all believed that this service was important to researchers. They mentioned reasons such as knowing the various licenses and what they mean and how the document can be shared, copied or replicated. Interviewee # 2 stated that “licenses enable the usage and clarify ownership of research output”.

Rating the quality of this service, provided by eRKC, to researchers

Interestingly, five of the interviewees (# 1, 3, 4, 7 & 9) were uncertain as to whether the eRKC provides this service currently. Two interviewees (# 5 & 8) indicated that they didn't think this service was offered by the eRKC as it was a task for legal services. The remaining two interviewees were aware of this service being offered.

Rating the quality of this service, provided by eRKC, to researchers

Two interviewees (# 2 and 6) believed that the eRKC is providing this service at a high standard and they provided reasons such as “licensing is the default for the basis of sharing data sets and using best practices are crucial” (Interviewee # 2). This opinion was supported by Interviewee 6 who mentioned the licensing used in the research publications and data repositories.

Activity 4.3: Rating the importance to researchers of guidance on selecting suitable accredited journals to publish in

All nine interviewees indicated that it is very important to researchers that the eRKC guides them in selecting accredited journals to publish in. Selecting accredited journals was seen as being beneficial to researchers' visibility and credibility and to be able to qualify for research funding.

The growing issue of predatory publications and publishers and avoiding these fake/dodgy publishing practices were raised in the majority of interviewee responses. In the words of Interviewee # 4, "not using accredited journals to publish in and standing the chance the publication is predatory leads to lost work and a bad reputation for the researcher". Interviewee # 9 agreed with this opinion and mentioned that publishing in non-accredited journals can damage the researcher's reputation.

Interviewee # 6 stated that "choosing accredited journals to publish in is crucial for exposure, global access and unit reporting."

Rating the quality of this service, provided by eRKC, to researchers

One interviewee, # 3, was not sure if the eRKC provided this service at a high standard. The remaining eight interviewees all responded yes to the question. The majority mentioned the availability of the list of accredited journals being available on the Virtual Library platform, and also the very knowledgeable staff who assist in guiding the researchers to choose suitable journals to publish in. Again, the Information Consultants (ICs) were mentioned several times as being at the forefront of this service. The impact assessment reports that are done by the Information Services team also received some mention, including in the words of Interviewee # 6, "not only do we provide unit impact assessment on the accredited journal articles, we also do it for individuals".

Interviewee # 2 raised the concern that, although the eRKC is the knowledgeable unit to advise on these accredited journals, researchers don't always listen and go ahead and publish in non-accredited journals.

Activity 4.4: Rating the importance to researchers of raising awareness of open access as a publishing option

All nine interviewees believed raising open access awareness is very important to researchers. Some of the reasons included were the extreme costs of creating research output and that being able to publish it to a wider audience via open access makes sense, publicly funded research should be shared in open access, providing easy access to information that would otherwise not be accessible. In the words of Interviewee # 9, “open access equals more visibility, wider audience and more citations”.

Rating the quality of this service, provided by eRKC, to researchers

Only one interviewee, # 1, was uncertain as to whether the eRKC provides this service at a high standard. Five interviewees (# 2, 3, 4, 5 & 6) believed that the eRKC does provide a high standard of service in this regard. They mentioned the Information Consultant’s raising awareness about open access, training sessions on open access and a good workflow process. Three interviewees (# 7, 8 & 9) stated that the eRKC could do more to raise awareness, change perceptions of the negative view of open access and to influence researchers to use open access as a publishing option.

Activity 4.5: Rating the importance for researchers of establishing a publication fund for publishing

Eight interviewees indicated that this service was important to researchers as no publications can happen without funding. They also mentioned the high costs of publishing in journals. Interviewee 9 expressed his opinion in terms of 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.

Interestingly, one (Interviewee # 3) was uncertain whether this service was important to researchers. Another (Interviewee # 8) was not aware that the eRKC does have such a service available and, in her words, “Having an article processing fund would be very convenient for HSRC researchers”.

Rating the quality of this service, provided by eRKC, to researchers

Four Interviewees (# 1, 4, 5 & 6) indicated that they believed that the eRKC is providing a high standard of service in this regard. They mentioned good APC workflow and investment in the service over the past two years to ensure a faster more streamlined process as reasons for their answers. Three interviewees (# 2, 3 & 7) were uncertain whether the eRKC provides a quality service in this regard. Interviewee # 8 voiced her opinion that the eRKC does not offer this service and that funding is dealt with at the research unit level. Interviewee 9 felt that the eRKC is not doing enough to promote this service and that researchers are not aware that this fund exists.

4.3.3.5 Research enabling services during the Preserve phase

Activity 5.1: Rating the importance to researchers of the development of research output repositories through accurate curation for storing, sharing and future use

All of the interviewees (9) agreed that this service is important to researchers, as these repositories showcase their intellectual property, store it for future use, share it for re-use and make it easily accessible to a wide 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 as “repositories are the home of research output”.

Rating the quality of this service, provided by eRKC, to researchers

All interviewees (9) believed that the eRKC provided repositories at a high standard. Some of the comments were around dedicated teams, good processes and ease of use. Many interviewees also commented on the high-quality information that is available in the repositories. Interviewee # 2 expressed her thoughts on the high quality of repositories and best practice standards that are used. In her words, “The repositories do justice to the research output of the organisation”. Interviewee # 6 concurred that relevant and accurate information in the repositories speaks to the HSRC’s mandate. Interviewee # 5 expressed her satisfaction with the repository development and noted that the high quality is in line with university standards. Interviewee # 9 indicated that the eRKC should archive more information to make their already excellent service even better.

Activity 5.2: Rating the importance to researchers of applicable metadata for research output repositories

All nine interviewees expressed that this service is very important to researchers. Interviewee # 1 noted that, “applicable metadata is as important as the data itself”. A majority of interviewees referred to the advantages of discoverability, sharing and finding of resources with proper metadata. Interviewee # 8 mentioned that no resources will be found without proper metadata, while Interviewee # 9 agreed, stating that “using standardised metadata makes future use of information easy”. In her words, Interviewee # 5 indicated that “metadata assists with creating high-level impact assessment reports”.

Rating the quality of this service, provided by eRKC, to researchers

All of the interviewees (9) 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. Interviewee # 3 further indicated that the metadata the eRKC provide is very detailed. The integration of resources in the eRKC with applicable metadata is 96% completed, as noted by Interviewee # 6.

Activity 5.3: Rating the importance to researchers of long-term preservation (more than 15 years) of research output

All of the interviewees (9) indicated that they believed this service to be important to researchers. Interviewee # 4 noted that long-term preservation allows for analysis of historical data and the more we store the better. Interviewee # 6 concurs with this opinion in that “South Africa is a very unique country, with very unique studies that build a historical profile of the country”. Interviewee # 9 used the example of historical data for Spanish Flu and SARS virus as instrumental in research for COVID-19 and asked, “Where would we be without the historical data?”

Rating the quality of this service, provided by eRKC, to researchers

The answers to this question varied widely between interviewees. Two (Interviewees # 1, and # 2) believed we do our 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 not sure if the eRKC does long-term preservation at all. The remaining interviewees indicated that the eRKC does provide this service at a high standard utilizing having data preservation folders, using the RMS (that is backed up), and storing files in a long-term preservation format such as PDF_A.

Activity 5.4: Rating the importance to researchers of promoting research output

All nine interviewees believed the promotion of research output to be very important/important to researchers. Reasons for visibility, sharing and re-use of the organisations' work were mentioned here. Interviewee # 1 said that researchers need as much exposure as possible, while Interviewee # 3 mentioned that, the "promotion of research output attracts potential funders from international organisations which encourages collaboration and brings investors to this country". Interviewee # 6 believed that promotion activities could also highlight the role of the eRKC in the organisation and outside, while Interviewee 8 stated that, "creating a footprint and reaching a wider audience increases citing's and re-use of your work." This opinion was also held by Interviewee # 9 who noted that promotion activities showcase what the HSRC does and can positively impact the researcher and research organisation as well as increase the re-use of the organisation's work.

Rating the quality of this service, provided by eRKC, to researchers

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 level best to promote research output via various channels. However, as Interviewee # 2 noted, "we cannot make them download data." Interviewee # 7 felt that research publications, in general, have more impact than research data because the data sets are not cited. The HSRC's impact assessment reports show high citations for certain journal articles but, in general, the h-indexes of HSRC researchers are relatively low, according to Interviewee # 8. It is therefore the overall feeling of the interviewed staff that more could be done in terms of promoting the HSRC's research output via social media and perhaps finding other platforms that might work as well.

4.3.3.6 Research enabling services during the Measure phase

Activity 6.1: Rating the importance to researchers of tracking the impact of their research through Bibliometrics

All the interviewees (9) believed that tracking impact through bibliometrics is important/very important 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. Interviewee # 1 noted that “researchers want as many citations as possible and these citations might be an indication of researcher quality and credibility”. In the words of Interviewee # 5, “bibliometrics can show how we, as researchers, have grown and, through impact analysis, we can compare ourselves with other researchers in the field”.

These results could be seen as positive feedback for the eRKC to take note of.

Rating the quality of this service, provided by eRKC, to researchers

Four interviewees (#1, 3, 4 & 7) indicated that they were uncertain whether the eRKC provides this service at a high standard. The remaining five interviewees believed that the eRKC does provide a high impact service in this regard. They all mentioned the very detailed and high-quality impact assessment report provided by the Information Services team. In the words of Interviewee # 5:

The eRKC plays an important role in the institutional impact assessment report where performance targets are set and reached every year. This report measures the citation of journal articles produced by the HSRC over the past five years. The eRKC also provides self-reflection reports for individual researchers in the organisation.

Interviewee # 9 also suggested that the eRKC should subscribe to the Web of Science to assist in making these impact reports even better.

Activity 6.2: Rating the importance to researchers of tracking the impact of their research through Altmetrics

One interviewee, # 1 indicated that he did not think this service was all that important to researchers. He explained that, in a more formal setting, such as the HSRC, alternative metrics are less important than bibliometrics for impact reporting.

The remaining eight interviewees all believed that Altmetrics is important to researchers. Interviewee # 2 provided the reason for it being important, “with high impact, it is easier for researchers to continue with research and follow up on loose ends and to get more funding”. 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 and, therefore, it is important to track this type of impact. Interviewee 8 mentioned that Altmetrics is “the new kid on the block” and “the new normal” and should be a service provided to the HSRC researchers”.

Rating the quality of this service, provided by eRKC, to researchers

Two interviewees (# 1 & 2) were uncertain whether the eRKC provided this service at a high standard, while three interviewees (# 3, 4 & 9) indicated that this service is not provided at all.

The remaining interviewees (# 5, 6, 7 & 8) noted that the eRKC can do better in this regard. They mentioned the use of PlumX as a possible impact measurement tool, but that more products should be investigated.

4.3.3.7 Interviewees’ eRKC-related suggestions or comments that might add value to this study

Table 4 indicates the comments and suggestions received in the open question where interviewees could comment freely. These comments might be suggestions for the eRKC to take note of.

Interviewee 1	No comment
Interviewee 2	More resources are necessary for proper literature reviews
Interviewee 3	No comment
Interviewee 4	Schedule training workshops around the research life cycle Build more awareness of the eRKC' s offerings Communicate the benefits of the eRKC' s services to researchers
Interviewee 5	Library online access platform must be improved
Interviewee 6	More emphasis on collaboration with research units
Interviewee 7	More collaboration with research units Sharing the impact assessment reports with all staff in the eRKC DSS should look at Big Data curation platforms DSS should look at data quality and how researchers can improve on that
Interviewee 8	eRKC should do more to embed themselves within the research units within each of the research life cycle phases eRKC should be collaborating more with research units Be more visible, especially in the planning of research projects phase
Interviewee 9	Be more pro-active Negotiate for better discounts for subscriptions of resources

Table 4: Comments and suggestions from interviews

4.4 Summarised quantitative and qualitative results per phase in the research life cycle

The results received from the questionnaire clearly show the importance of currently provided eRKC services linked to activities in the Gather (91.1%), Preserve (89.8%), Measure (87.8%) and Share (82.8%) phases. Respondents believed the services to be of lesser importance, but not insignificant, in the Prepare (68.2%) and Gather (77.4%) phases.

From the interview responses, it is clear that a majority of interviewees believed that the services provided in the various phases of the research life cycle are important/very important to researchers. The following average positive responses were recorded for the Prepare phase (8 responses), Gather phase (8 responses), Create phase (9 responses), Share phase (8 responses), Preserve phase (9 responses) and Measure phase (9 responses).

These results indicate that the eRKC might consider creating more awareness of the services offered during the Prepare and Gather phases. The results could also possibly show the respondents' lack of knowledge about the importance of the services dealing with the Prepare and Gather phases' and could indicate an opportunity for the eRKC to actively create awareness of these services in each of the research life cycle phases. It was evident from the interviews that staff felt that the sooner the eRKC becomes involved in the research life cycle, the fewer the field errors that will arise when data is collected. It is also noticeable that many interviewees believed spatial consultations should happen at the beginning of projects rather than later on, to avoid the possibility of not being able to spatially define the data at a later stage.

Compared to the importance of eRKC services, as detailed above, the distribution of questionnaire respondents' use of these services within each of the phases looks somewhat different. The Create phase (68.2%), followed by the Gather phase (67.5%) received the highest percentage of use of the services in these phases. Of note is that, although respondents rated the importance of the services in these phases as high, they used them less than expected. This is especially visible in the Preserve (58.7%), Prepare (47.5%), Share (42.6%) and Measure (25.5%) phases. In this study, the respondents were not requested to provide reasons for their answers, and therefore the reason for this result is unknown. It might be an indication that the respondents were not previously aware that the eRKC provided this service and that they would be 'open' to receiving support in this regard. This creates an opportunity for the eRKC to expand and actively promote all research life cycle services to the HSRC researchers.

Although the questionnaire respondents indicated that some of the offered services were less used, the respondents who did use the services regularly or sporadically indicated a satisfied/very satisfied response for the Create (91.1%), Preserve (89.8%), Measure (87.8%) and Share (82.8%) phases.

From the interviews, the eRKC staff indicated that, on average, they believed that the eRKC provided a high-quality service in the Prepare phase (6 responses), Create phase (6 responses) and Preserve phase (8 responses). It is noteworthy that the results between the two population groups do not correspond for the Prepare, Measure and Share phases of the research life cycle. The Prepare phase, delivered at a high-quality standard, according to the interviewees, received only a 69.5% satisfaction level from questionnaire respondents. The responses recorded about the Create and Preserve phases are similar for both population groups. The level of satisfaction in the Measure phase, according to questionnaire respondents was high (87.8%), while only five interviewees, on average, rated the service delivery as being of high quality. Another noteworthy point is that in the Share phase, according to the questionnaire respondents received an 82.8% satisfaction level, while only five interviewees, on average, rated the services in this phase as being of high quality. The difference in results between the two population groups is explained by the reasons provided by the interviewees. The main reasons were noted as the eRKC staff not being aware of the services on offer to researchers during these phases. This is an alarming result and might be an indication for the eRKC to raise awareness of all services between the three sub-units to ensure that the staff themselves are knowledgeable.

The average results from the questionnaires and interviews are represented visually in Figures 92 and 93.

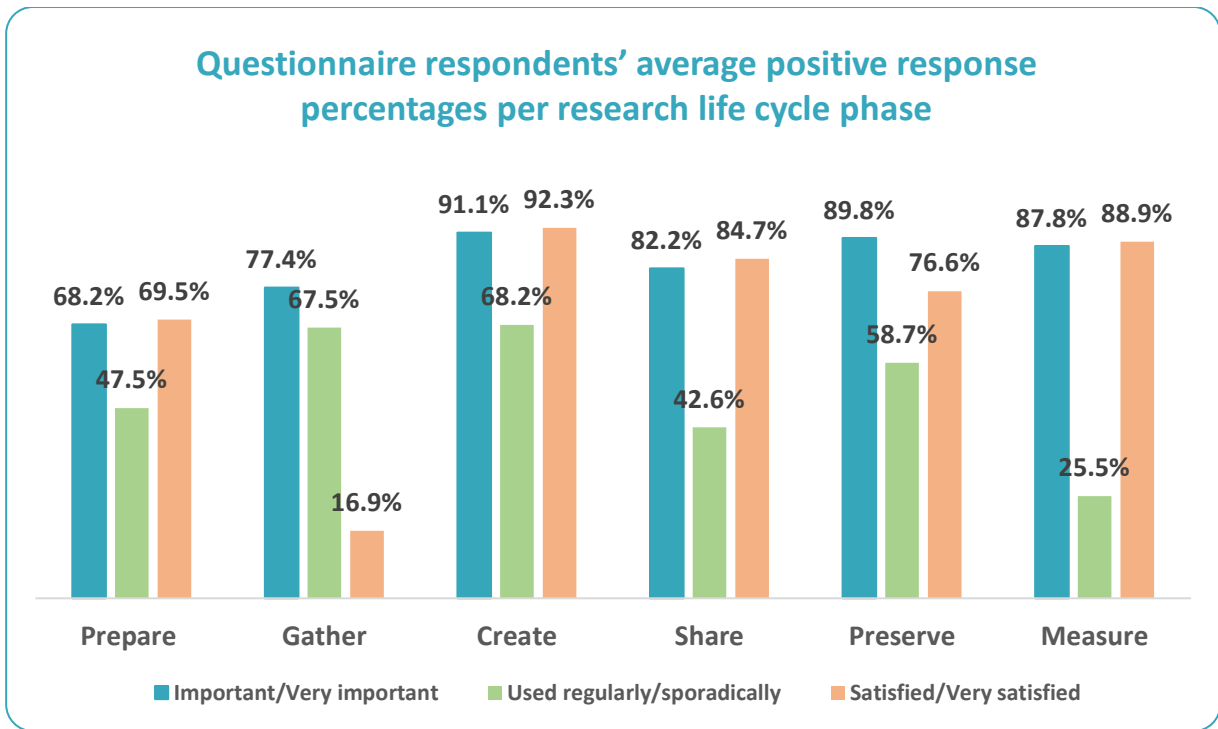


Figure 92: Questionnaire respondents' average positive response percentages per research life cycle phase

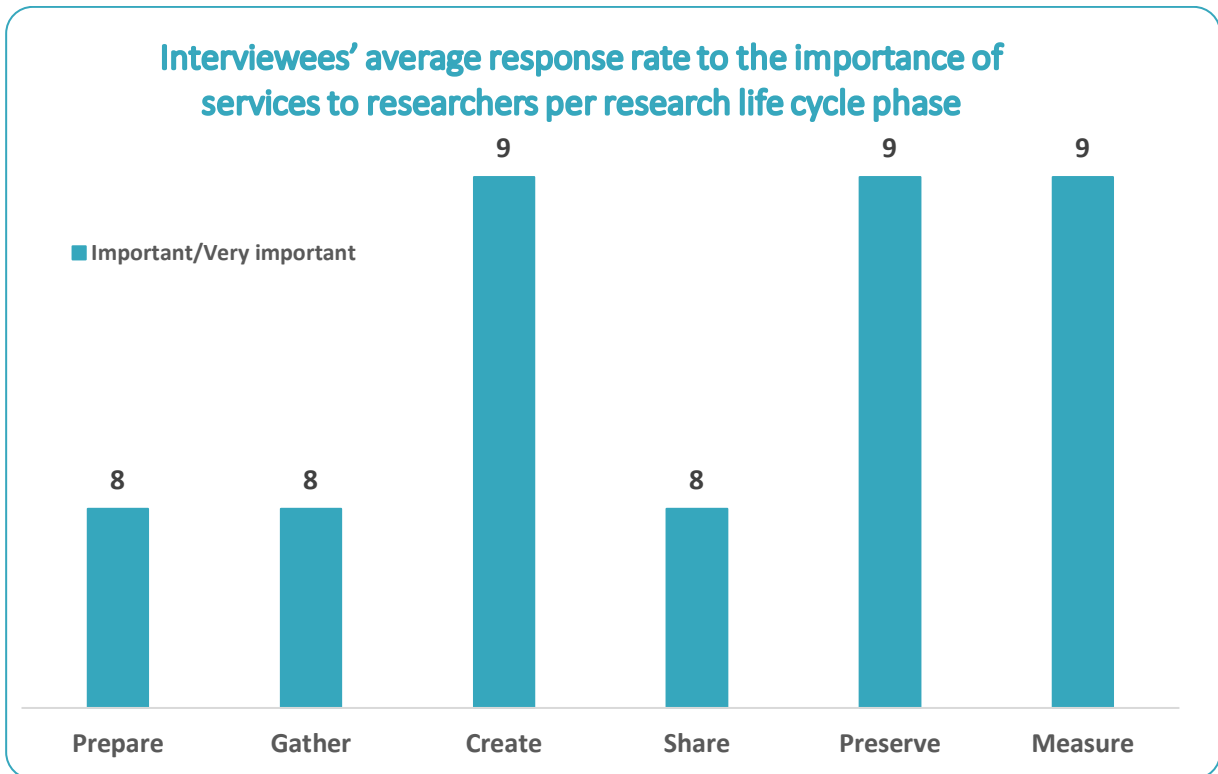


Figure 93: Interviewees' average response rate to the importance of services to researchers per research life cycle phase

Not only should the positive results within each of these phases be of importance in this study, but the marginal results obtained – which provided a more neutral or negative response – are the results that could potentially have a negative influence on the eRKC and its research offerings.

Noteworthy are the 83.1% of questionnaire respondents that were neutral/dissatisfied/very dissatisfied with the services in the Gather phase. The qualitative data concurred with this result in that, on average, only five interviewees regarded the services in the Gather phase to be delivered at a high standard. Also noteworthy is the result in the Measure phase where 74.5% of the questionnaire respondents indicated a ‘neutral/will consider using the service/will not use it’ response. Again, only five interviewees, on average, believed the services in the Measure phase are delivered at a high standard.

These results might be an indication for the eRKC to invest in following up on service delivery, not only in the Gather phase but for the complete research life cycle, to ensure client satisfaction. It is here where the eRKC might be able to make a substantial contribution in creating awareness, expanding and actively promoting their services to the HSRC researchers within each of these research life cycle phases.

The results are visually reflected in Figures 94 and 95.

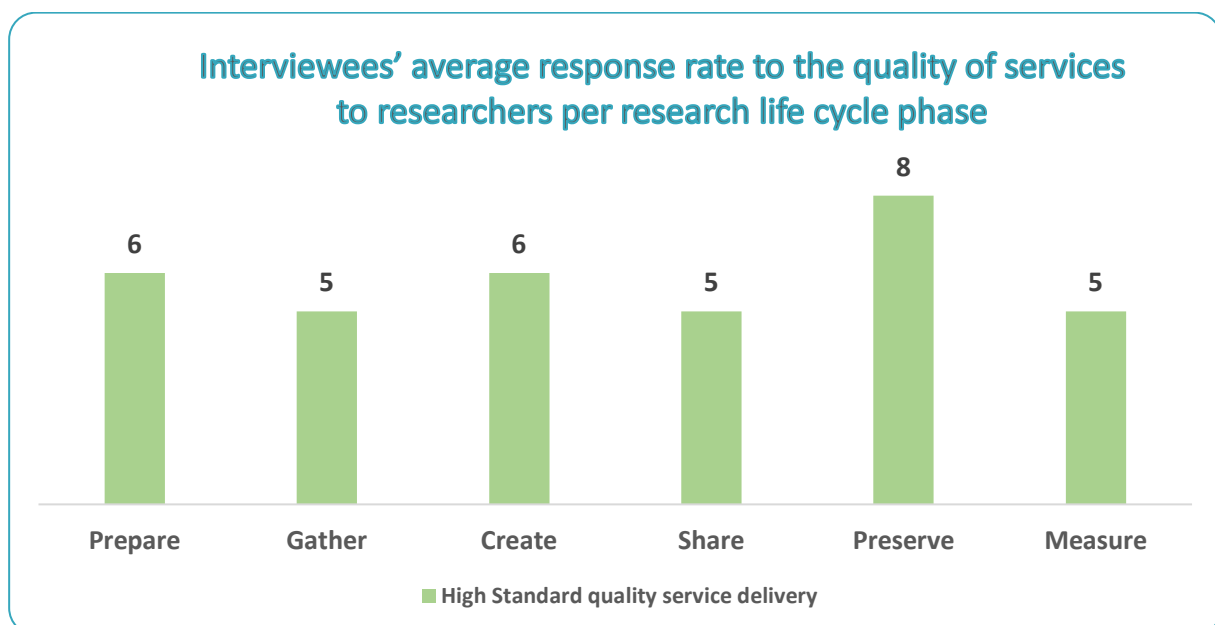


Figure 94: Interviewees' average response rate to the quality of services to researchers per research life cycle phase

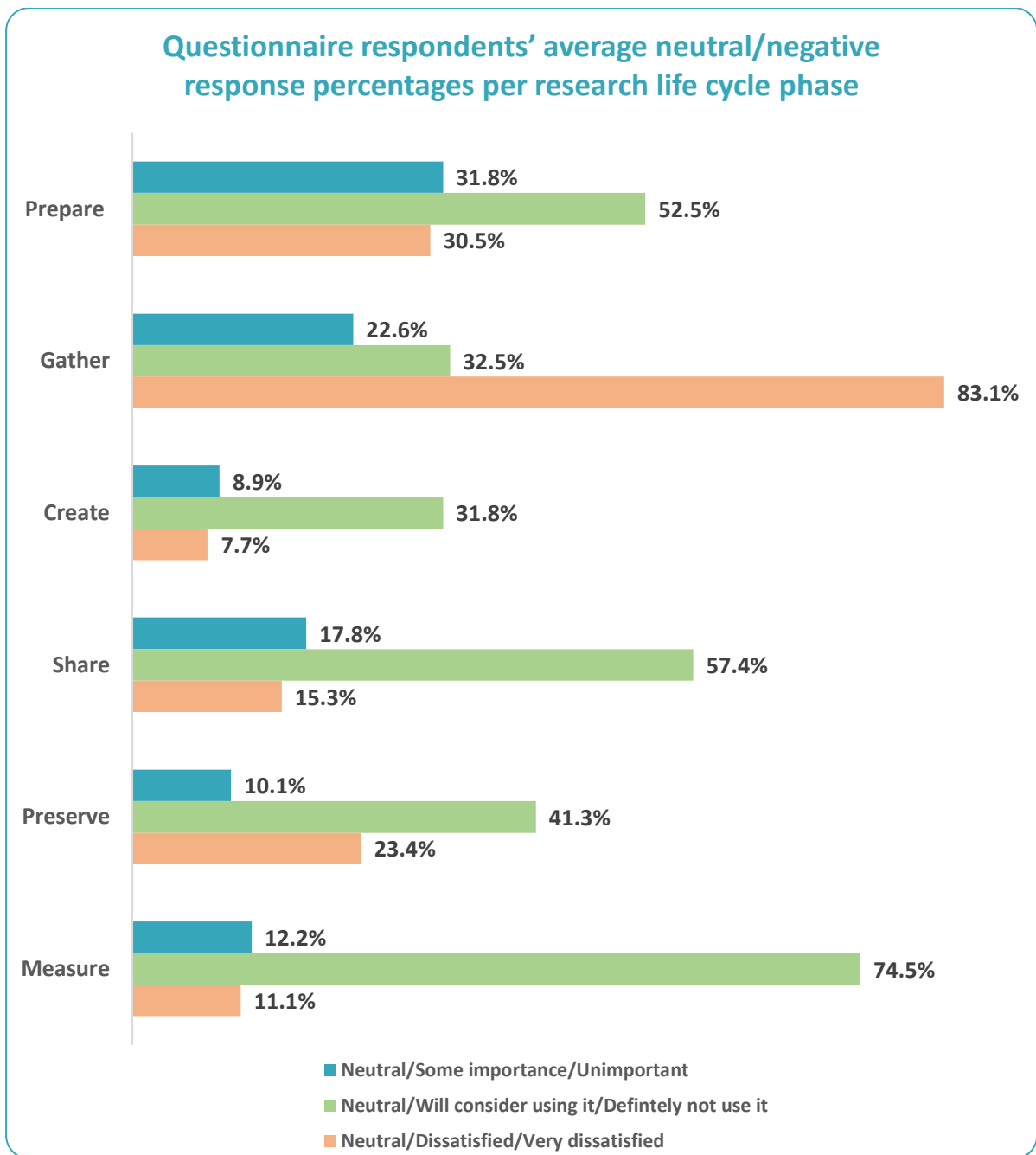


Figure 95: Questionnaire respondents' average neutral/negative response percentages per research life cycle phase

4.5 Summary

The researcher found all participants to have been truthful in responding to both the qualitative and quantitative phases of the research.

This feedback has allowed the researcher to address the research questions as set out in Chapter 1 and are discussed in detail in Chapter 5.

CHAPTER 5

MAIN FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

The HSRC researchers have had the support of the eResearch Knowledge Centre (eRKC) since its inception in 2018. This unit's purpose is to support the HSRC researchers in enabling research that impacts all lives in South Africa. However, no earlier studies employing empirical evidence have been carried out to demonstrate that this newly created unit is, in fact, able to successfully support HSRC researchers. According to Corral (2014:18), determining the research community's perceptions and expectations of library support services, is important if academic libraries are to ensure the development of specialised and relevant support services at every stage of the research life cycle (Corral, 2014:18).

Therefore, this study attempted to assess the current eRKC research support practices and to determine which are adequate and which are not – as well as to determine whether there are any new or additional services needed to assist researchers in achieving their research objectives. Data obtained attempted to answer the research questions set for this study, namely:

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

A multi-method approach was adopted for this study and supported by an established research life cycle model as a theoretical framework. For the quantitative data collection, an online questionnaire was administered and, for the qualitative section, individual interviews were conducted. A census of the population was adopted for the questionnaire to ensure that every population section in the HSRC was addressed. Staff with a valid HSRC email address (156) in any of the four HSRC offices within the country were invited to complete the questionnaire. For the individual interviews, purposive sampling was chosen, including three staff members from each of the sub-units – Information Services, Digital Scholarship Services and Geospatial Analytics – for a total of nine interviews conducted.

This chapter concludes the research study dissertation. A summary of the main research findings and the significance and implications of this research study in the immediate context of the HSRC, is presented. The chapter closes with recommendations for the eRKC as well as for further research studies.

5.2 Main findings and Implications

5.2.1 Sample characteristics

The characteristics of the study sample are very often overlooked in a research study and could present interesting findings. The findings reported below have implications for this study:

- The low questionnaire response rate (34%) – This indicates potential differences in the responses received from the online questionnaire and the possible responses that would have been received if more researchers participated in the survey.
- The high response rate from the Cape Town office (47.2%) versus the much lower response rate from the Pretoria office (26.4%). This finding could indicate a disconnection due to distance and that more face time is needed between the eRKC and the Cape Town office.

5.2.2 Research Enabling Services in the Research Life Cycle Model

- The eRKC's current support services can be assigned to a specific stage within the research process by linking them to the activities that are important during each of the life cycle phases. This alignment demonstrates the unit's role in providing the services that are needed within the research process and is a positive outcome for the eRKC.
- HSRC researchers (83%) believed the current eRKC research support services to be important or very important to their work (Figure 92). Similarly, the majority of interviewees concurred with this result (Figure 93). This affirms that these services, as currently provided by the eRKC, are necessary and of value to the HSRC researchers.
- The current eRKC support services are not used to their full potential (52%) by HSRC research staff (Figure 92). The services in the Prepare, Share, Preserve and Measure

phases were particularly underutilised. This result implies that the eRKC is not raising enough awareness of its support services and their value for HSRC researchers.

- Although a lower percentage of HSRC researchers had used the current eRKC support services, those who did (71.5%), were satisfied or very satisfied with the services received (Figure 92). This result indicates that these services are received well and are a positive outcome for the eRKC.
- There is a need for more awareness and expansion of the eRKC support services in the Gather phase. From the quantitative data, 83.1% of respondents were neutral/dissatisfied/very dissatisfied with the services in this phase (Figure 95). The qualitative data affirmed this result (Figure 94). The results suggest that the services in the Gather phase are viewed as merely a service and that the required supporting, empathic relationship, that instils trust and synergy between the eRKC staff and the HSRC researchers, are lacking in this important phase. Guidance in determining the research methods and research design, as well as access to useful and quality information resources and guidance on ethics applications, are critical activities to ensure research is impactful, according to Raju & Schoombee (2013:33).
- The eRKC must partner with the research units and be involved in the research life cycle from the start of the process. Activities, such as assistance with field data collection and spatial conceptualisation, will reduce data errors, which in turn will ensure quality data products and reduce cumbersome curation activities.
- Results for the Measure phase affirm that the eRKC should expand and promote the services in this phase to ensure client satisfaction as 74.5% of the questionnaire respondents indicated a 'neutral/will consider using the service/will not use it' response. Again, the interviewees concurred with this result (Figures 94 and 94).
- There is a discrepancy in the results between the two population groups regarding the level of satisfaction with services provided in the Prepare, Measure and Share phases of the research life cycle (Figures 92 & 93). This discrepancy suggests that the eRKC and HSRC researchers might effectively be operating as independent entities (in silos). This runs counter to the complementary relationship that should exist between the eRKC and the HSRC researchers.
- The neutral or negative responses in each of the research phases also affirm that the eRKC can do more to make researchers aware of the services they offer and the value these to their research outcomes (Figures 94 & 95).

- Research Data Management (RDM) is not provided at a high level and could be expanded and promoted.
- There is a suggestion for a need for a data analysis service and to grow capacity, within the HSRC, in this regard.
- eRKC staff are unsure of or unfamiliar with some of the current research support services. This result also speaks to the confidence result in Figure 89, where only 52.8% of HSRC researchers are confident that the eRKC staff are sufficiently knowledgeable to assist with any relevant enquiries and that they keep abreast of new technologies and products. These results affirm that eRKC internal awareness and integration between sub-units are lacking.

5.3 Research Questions

5.3.1 Are the current eRKC research support services aligned with HSRC researcher requirements?

This question was answered, partly by responses to the online questionnaire concerning the importance of the services to the respondents' work as well as by the interview data on how important eRKC staff believed these services to be for researchers; partly by respondents' use of, or consideration of using, the current research support services provided by the eRKC. The matter of the level of user satisfaction with the current services also emerged from both the responses and interviews and further informed the answering of the research question.

While it is clear from the results that the currently offered research support services are aligned with the requirements of the HSRC researchers, this is by no means a perfect service. This study has, however, highlighted the areas of expansion or promotion that will be necessary to bring this service to its potential.

5.3.2 Are there any new or additional services that the eRKC could implement to support the HSRC researchers and, if so, what would these be?

This question was answered by the open question in the online questionnaire as well as by the explanations proffered by interviewees. The results mentioned only one additional service to be added to the eRKC's repertoire which refers to data analysis of HSRC data and building capacity within the HSRC for data analysis.

There were many suggestions arising from both the quantitative and qualitative data, indicating how some of the services could be expanded.

These matters are addressed in the recommendations, below.

5.4 Recommendations

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 that result from the investigation are divided into categories for the eRKC to consider in terms of their research support services during the research life cycle.

As a result of the insights gained through this study, the researcher recommends the following service initiatives for future implementation by the eRKC:

5.4.1 Proactive Marketing and Awareness Raising

Proactive marketing of services has been somewhat less imperative in traditional libraries. With the developments within the ICT sector, new legislation and traditional research practice are steered towards a more digital research practice policy (University of Cape Town, 2019). Libraries will, therefore, continuously have to prove the value of their services in this new environment. According to Vaughan et al. (2013:310), libraries should make a reasonable effort to enhance their visibility amongst researchers. Raju and Schoombee (2013:29) also refer to librarians being pro-actively involved with the researcher throughout the research process.

In the words of a questionnaire respondent: "I think eRKC staff should be more proactive in reaching out to senior HSRC staff and explaining what support services they can offer. eRKC is a distinctive service not available to researchers in universities, but HSRC researchers don't make full use of it. Senior research staff are extremely busy and don't read every email sent to them by eRKC and other units. An occasional phone call or personal visit by eRKC staff starting with the basic question, 'How can I be of assistance to you?' would go a long way, I think".

Another respondent writes: “I have undertaken this survey to assist the researcher but, in the time, I have been with the HSRC, I cannot say I am aware of the nature of the work done by the eRKC”. There are several more comments on the topic of awareness and visibility from the questionnaire respondents. The interview results also support the awareness situation in that many of the eRKC staff are unsure or unfamiliar with some of the current research support services being offered.

The eRKC’s online visibility is also an aspect that needs attention. In the words of one respondent: “It would be helpful to have a direct link on the main HSRC landing page to the library services, for quick access”.

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.

5.4.2 Integration between sub-units within the eRKC

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 is futile if so, many staff indicated they were unsure or unfamiliar with the research offerings. A suggestion to overcome this problem might be an internal education mission with a test to assure the unit staff are all aware and knowledgeable about the services on offer.

5.4.3 Collaboration and/or Partnerships with HSRC Research units

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 mostly unsuccessful and that researchers only find aspects in the project when it is too late to involve the eRKC. In addition, the questionnaire respondents (21.7%) believed these partnerships to only be somewhat successful (Figure 19). For the eRKC to be an integral part of research and as a partner throughout the research life cycle (Vaughan et al.,2013:13), collaboration and/or partnerships between the eRKC and research divisions are critical.

5.4.4 Researcher Orientation and Training Workshops

It is incumbent upon academic libraries to train researchers in the areas that they require, writes Atkinson (2016:137). HSRC researchers' responses to the questionnaire indicated that they believed training on the various eRKC services to be important to their work. The interviewees concurred that they believed that the training is very important.

In the words of a respondent: "Since joining the HSRC I have had no orientation around the purpose of eRKC and how it can assist me and my 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 important activities in each phase. In addition, future awareness training on the use of metrics for research impact is recommended as 92.5% of respondents indicated the importance of training on this topic for their work (Figure 36).

5.4.5 Research Data Management (RDM)

Chiware and Becker (2018:1) recommended more advocacy for research data management, and academic and research libraries are urged to take the lead in this regard.

Although questionnaire respondents (79.2%) and interviewees (eight responses) believed data management to be important, several interviewees indicated that the data management planning and guidance to complete a data management plan is required at a higher level. They mentioned the fact 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 that is necessary during the curation process.

In addition, one questionnaire respondent mentioned that the eRKC could do more to assist researchers with the deposit of data for curation as the current process is very cumbersome. The eRKC has the responsibility to make this process easy on

researchers to ensure more data is submitted and curated to create visibility and re-use. A possible 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.

5.4.6 Data analysis and capacity building in this regard

In the words of one of the questionnaire respondents, “One nascent 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 important, together with RDM, in the Gather phase, it would be impossible to commit one of the eRKC staff to data analysis for each of the HSRC’s projects. Kong, Fosmire and Branch (2017:421) suggest that, instead of taking data analysis on themselves, libraries should include data analysis in their training workshops to allow researchers to be more self-sufficient.

5.4.7 Research impact

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 (2013:33), 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 are increasingly showing their limitations and more has to be done to measure research impact. As one respondent 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 the social and economic dynamics of communities”.

Another respondent indicated, “One nascent 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”.

One interviewee requested the impact assessment report to be shared with all colleagues in the eRKC.

5.4.8 The research life cycle model as a framework

Parker (2012:8) recommended academic libraries inspect their research support practices by using the research life cycle model as a guideline. This statement is supported by Vaughan et al. (2013:313) noted 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 be used to 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.

5.4.9 Future studies

In this section, potentially useful research studies for future undertaking is recommended. The current study investigated whether the eRKC-provided research support services align with HSRC researchers’ requirements. A suggestion would be for 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.

The study was limited to HSRC researchers, a further possibility is to look into the entire HSRC staff’s research needs or requirements, if any, and not to only apply it to research staff. The current study’s focus was general and further studies can be steered towards

research support requirements between age, gender, qualifications, campuses as well as the adoption of e-research principles within the HSRC.

The complex nature of e-research suggests collaboration with organisational management to provide the necessary services for e-research in the HSRC. The current study did not 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. A further suggestion would be to investigate 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. Future research in this regard could enhance the competencies of librarians and other eRKC staff in providing e-research support.

Research impact and the measure thereof is an important outcome for the HSRC. A study looking into the measurements used to track impact and the possibilities to enhance impact would be suggested. The Impact Centre, together with the eRKC, would be in a position to build the data analysis capacity that is currently lacking within the HSRC. Subsequently, further studies investigating this possibility is suggested.

Data management planning is not as visible in the HSRC as it could be and further studies are encouraged to increase visibility via the eRKC online platform.

The low response rate received in the current study might warrant for an investigation into why such a large proportion of a research organisation, such as the HSRC, would decline to take part in a study such as this one, which speaks to their everyday needs and how a better response to such an investigation could be elicited to make the results more representative.

In addition, a comment received from the questionnaire responses raised the question about the link between the mandate of the Impact Centre and that of the eRKC. A future study investigating the link would be valuable.

5.5 Conclusion

In this study, the newly created eRKC unit (inception 2018) was identified as a research support unit for researchers employed by the HSRC. The unit's vision is to enhance the HSRC's research capability through innovative information services, geospatial solutions and digital scholarship services (HSRC, 2018).

Chapter 1 of this study described the background of the eRKC and, in light of this background, the HSRC researchers were identified as clients whose needs and expectations were investigated to determine whether or not this unit is supporting the HSRC researchers accordingly.

The study findings, obtained through data from online questionnaires directed at the HSRC research staff, and individual interviews with selected eRKC staff, were rich and clear and illustrated how the research life cycle (Section 3.2) could be effectively implemented in assigning the eRKC's services to a specific phase in the life cycle and to determine whether researchers' needs are aligned within each phase.

The researcher gained a renewed understanding of the needs and expectations of the HSRC researchers and this knowledge will be useful for the eRKC to ensure the alignment of research support services to the researcher's needs, as well as for the design and implementation of future research support endeavours. 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, as currently provided by the eRKC, important to their daily work and that they are 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, especially in the Prepare and Gather phases of the research life cycle, 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 research data management were highlighted.

The implementation of recommendations made in this study could strengthen the role of the eRKC in becoming indispensable in providing research support services in the HSRC. Receiving quality research support services from the eRKC directly impacts the HSRC researchers' productivity and achieving research goals, which ultimately creates a high calibre researcher within an excellent research organisation.

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APPENDIX A

ONLINE CENSUS QUESTIONNAIRE

Link to the online questionnaire: <https://forms.gle/yJQRULmWrtyCQR6j6>

This questionnaire forms part of a Master's study undertaken by the researcher at the University of Cape Town under the supervision of Dr Patrick Mapulanga.

The title of the study is Assessment of the eResearch Knowledge Centre's support practices in the Human Sciences Research Council in Pretoria, South Africa.

The research life cycle model of Raju and Schoombee (2013:32) was adopted as the theoretical framework underpinning this study. The research lifecycle model is relevant and suitable to provide a framework to assess researchers' needs and to guide libraries in structuring their support practices according to the phases within the research lifecycle.

The phases of the adopted research life cycle are:

Prepare - During the "Prepare" phase (ideas and planning), the researcher chooses a topic and composes a research question. Thereafter, the budget is calculated, funding secured, a suitable supervisor/advisor identified, background reading undertaken, workspaces identified, and the project planned, and skills workshops may be attended.

Gather - 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 submission for ethics approval takes place

Create - The "Create" phase sees the researcher undertaking proof-reading, fulfilling copyright requirements and avoiding plagiarism. The referencing and bibliography are completed, along with the initial writing up, editing, analysis and interpretation of results.

Share - Included in the "Share" phase are optimising researcher visibility, the building of research networks, publishing and collaboration with other researchers and sourcing of publishing funds

Preserve – The “Preserve phase includes backing up of research conducted, making research output discoverable, archiving outputs and managing/archiving datasets for sharing and future use.

Measure – The measure phase uses metrics in support of funding applications, demonstrating impact, and deciding where the research should be published.

These six phases are to be used to measure eRKC-provided research support practices and to determine additional support needs of HSRC researchers.

I would be very appreciative of your participation in your capacity as a member of the HSRC research staff. The questionnaire will take approximately 45 minutes to complete.

Your responses will be kept strictly confidential and data from this research will be anonymously reported in the resulting master’s dissertation.

If you have any questions or need any clarification about this study, please contact Ms Hanlie Baudin on 082 517 0855 or via BDNJOH011@myuct.ac.za.

I need your explicit consent to participate in this study. You may indicate this by clicking "Yes" in the consent field.

Should you select 'No" in the consent field, no further questions will be presented.

You may print or save a copy of this form for your records.

Consent

Do you consent to participate in this study?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

Biographical Information

Please tick the relevant box to indicate your answer.

1. Please indicate your current job title/rank at the HSRC.

			✓
a.	Executive	(including Divisional Executive, Strategic Lead)	
b.	Director	(Director)	
c.	Chief Research Specialist	(including Chief Research Specialist, Chief Research Manager)	
d.	Senior Research Specialist	(including Senior Research Specialist, Senior Research Manager, African Research Fellow)	
e.	Research Specialist	(including Research Specialist, Research Manager, Postdoc Fellow)	
f.	Researcher	(including Junior, Assistant Researcher, Researcher, Senior Researcher, Chief Researcher)	.
g.	Intern	(including Honours, Masters or PhD)	
h.	Other		

If other, please comment (optional)

2. Highest academic qualification.

		✓
a.	Undergraduate degree	
b.	Postgraduate or honours degree	
c.	Master's degree	
d.	PhD	
e.	Other	

If other, please specify

3. How long have you been employed at the HSRC?

		✓
a.	Less than one year	
b.	One to two years	
c.	Three to five years	
d.	Six to ten years	
e.	More than ten years	

4. At which of the HSRC offices are you based?

		✓
a.	Pretoria	
b.	Cape Town	
c.	Durban	
d.	Sweetwaters	

Phase 1: Research enabling services during the Prepare phase (planning and ideas) of the research lifecycle

In each case, please select the most appropriate option to describe your need for and experience of the services. If you do not answer a question, it will be counted as Not Applicable (N/A).

5. Environmental scanning (identify gaps in the research, do background reading and find experts on the topic of interest)					
5.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
5.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
5.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

6. Spatial consultation on research topics					
6.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
6.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
6.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

7. Identify research funding opportunities					
7.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
7.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
7.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

8. Do you think it is necessary for eRKC staff to partner with research divisions during the research process?					
8.1 Rate the importance of this partnership to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important

9. If you think it is necessary for the eRKC to be research partners, do you think the eRKC does enough to ensure these partnerships are successful?					
9.1 Rate how successful the eRKC's partnerships are	Very successful	Successful	Neither successful nor unsuccessful	Somewhat successful	Not successful at all

10. Training and orientation workshops on services and tools, provided by the eRKC, that are available during the research process					
10.1 Rate the importance of these workshops to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
10.2 Have you attended or considered attending these training sessions?	Yes, regularly	Yes, but sporadically	Have not attended or considered attending	No, but will consider attending in future	No, will definitely never attend
10.3 Describe the value you feel you have gained from the sessions listed in sections 10.3.1 – 10.3.13					
10.3.1 Geospatial analytics in the	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable

research process					
10.3.2 Exploring survey data using open source GIS	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.3. Navigating the virtual library and WorldShare	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.4 Literature review and search strategies	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.5 Responsible authorship: iThenticate	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.6 ORCID and Google Scholar profiles	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.7 How to use Scopus	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.8 How to use Research Africa	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.9 Data deposit and curation processes at the HSRC	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.10 Qualitative and Quantitative data management	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.11 Research output accreditation and reporting	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.12 Potentially fake Publishers and conferences	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable
10.3.13 Bibliographic management: Mendeley	Very valuable	Moderately valuable	Undecided	Marginally valuable	Not valuable

10.4 Metrics for research impact				
10.4.1 Rate the importance of future awareness and training on the use of metrics for research impact on your work				
Very important	Important	Neither important nor unimportant	Has some importance	Not important

Phase 2: Research enabling services during the Gather phase of the research lifecycle

In each case, please select the most appropriate option to describe your need for and experience of these services.

If you do not answer a question, it will be counted as Not Applicable (N/A).

11. Access to useful and high-quality information resources					
11.1 Rate the importance of these services to your work					
Print collection (books and journals)	Very important	Important	Neither important nor unimportant	Has some importance	Not important
e-Resources (e-journals and e-books)	Very important	Important	Neither important nor unimportant	Has some importance	Not important
HSRC's Research Publications collection	Very important	Important	Neither important nor unimportant	Has some importance	Not important
HSRC's Research Data collection	Very important	Important	Neither important nor unimportant	Has some importance	Not important
Spatial information on similar projects and methods used in previous studies	Very important	Important	Neither important nor unimportant	Has some importance	Not important
11.2 Have you used, or considered using these services?					
Print collection (books and journals)	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
e-Resources (e-journals and e-books)	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it

HSRC's Research Publications collection	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
HSRC's Research Data collection	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
Spatial information on similar projects and methods used in previous studies	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
11.3 In general, are you satisfied with these services?					
Print collection (books and journals)	Very satisfied	Satisfied	Neither satisfied not dissatisfied	Dissatisfied	Very dissatisfied
e-Resources (e-journals and e-books)	Very satisfied	Satisfied	Neither satisfied not dissatisfied	Dissatisfied	Very dissatisfied
HSRC's Research Publications collection	Very satisfied	Satisfied	Neither satisfied not dissatisfied	Dissatisfied	Very dissatisfied
HSRC's Research Data collection	Very satisfied	Satisfied	Neither satisfied not dissatisfied	Dissatisfied	Very dissatisfied
Spatial information on similar projects and methods used in previous studies	Very satisfied	Satisfied	Neither satisfied not dissatisfied	Dissatisfied	Very dissatisfied

12. Guidance on data management planning and completing a data management plan					
12.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
12.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it

12.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
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13. Review data management plans as part of the ethics application process					
13.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
13.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
13.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

14. Consultations and support in the collection of field data					
14.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
14.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
14.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

Phase 3: Research enabling services during the Create phase of the research lifecycle

In each case, please select the most appropriate option to describe your need for and experience of these services. If you do not answer a question, it will be counted as Not Applicable (N/A).

15. Clarify copyright and intellectual property rights					
15.1 Rate the importance of	Very important	Important	Neither important	Has some importance	Not important

this service to your work			nor unimportant		
15.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
15.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

16. Guidance on citation styles and referencing					
16.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
16.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
16.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

17. Guidance on avoiding plagiarism through the use of software such as iThenticate					
17.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
17.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
17.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

Phase 4: Research enabling services during the Share phase of the research lifecycle

In each case, please select the most appropriate option to describe your need for and experience of these services. If you do not answer a question, it will be counted as Not Applicable (N/A).

18. Update professional information on the ORCID platform					
18.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
18.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
18.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

19. Assistance with the use and implications of license, for example, Creative Commons Licensing					
19.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
19.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
19.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

20. Selecting suitable accredited journals to publish in					
20.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
20.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
20.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

21. Raise awareness of open access as a publishing option					
21.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
21.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
21.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

22. Sourcing publication funds for publications – use of, for example, the Article Processing Charges (APCs) funds within eRKC					
22.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
22.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
22.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

Phase 5: Research enabling services during the Preserve phase of the research lifecycle

In each case, please select the most appropriate option to describe your need for and experience of these services. If you do not answer a question, it will be counted as Not Applicable (N/A).

23. Develop research output repositories (data and publications) based on best practice curation processes to ensure all outputs are archive and available for sharing and future use.					
23.1 Rate the importance of these repository services to your work:					

Research Publications	Very important	Important	Neither important nor unimportant	Has some importance	Not important
Data sets	Very important	Important	Neither important nor unimportant	Has some importance	Not important
23.2 Have you used or considered using these repository services?					
Research Publications	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
Data sets	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
23.3 If you have used these repository services, please rate how satisfied you are with them in general					
Research Publications	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
Data sets	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

24. Create applicable metadata for successful sharing and harvesting of research output (data and publications)					
24.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
24.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
24.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

25. Long-term preservation (more than 15 years) of research output (data and publications)

25.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
25.2 Do you think the eRKC should take responsibility for long-term preservation?	Definitely	Probably	Undecided	Probably not	Definitely not

26. Promotion of research publications and data sets via the repository, social media and other platforms					
26.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
26.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
26.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

Phase 6: Research enabling services during the Measure phase of the research lifecycle

In each case, please select the most appropriate option to describe your need for and experience of these services. If you do not answer a question, it will be counted as Not Applicable (N/A).

27. Track the impact of my research through bibliometric analysis to assist with applications for NRF-rating, funding, and promotions (citations, h-index, and journal impact factors)					
27.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
27.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it

27.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
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28. Track the impact of my research through Altmetrics (alternative metrics) to determine the societal impact (Social media, blogs, newspapers, and other online engagements)

28.1 Rate the importance of this service to your work	Very important	Important	Neither important nor unimportant	Has some importance	Not important
28.2 Have you used or considered using this service?	Yes, used it regularly	Yes, used it sporadically	Have not used or considered using it	No, but will consider using it in future	No, will definitely not use it
28.3 In general, are you satisfied with this service?	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied

29. Which of the following describes your level of confidence in the staff of the eRKC?

a.	I have full confidence that the eRKC staff are sufficiently knowledgeable to assist me with any relevant enquiries and that they keep abreast of new technologies and products.	
b.	I am somewhat confident that the eRKC staff are sufficiently knowledgeable to assist me with any relevant enquiries and that they keep abreast of new technologies and products.	
c.	I am neither confident nor unconfident.	
d.	I have little confidence that the eRKC staff are sufficiently knowledgeable to assist me with any relevant enquiries and that they keep abreast of new technologies and products.	
e.	I have no confidence in the eRKC staff at all.	

Open question

30. Please highlight any aspect related to the eRKC that you have not mentioned before, which you think can add value to this research.

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Thank you for your participation. Your input is valued and very much appreciated.

Ms Hanlie Baudin

APPENDIX B

INTERVIEW GUIDE AND QUESTIONS FOR INDIVIDUAL INTERVIEWS

Biographical Information

1. Please introduce yourself and tell me a little about your role and functions of your current position at the HSRC.
2. Please state your highest academic qualification.
3. How long have you been employed at the HSRC?

Allow 10 minutes to discuss

Presentation

Introduce the interviewee to the research lifecycle model (Raju and Schoombee, 2013:32) that will be used as the theoretical framework underpinning this study. Explain that the research lifecycle model is made up of six Phases and that these Phases will be used to assess the eRKC's research support offering to HSRC researchers and to determine any additional requirements in terms of the services provided by the HSRC.

The questions are structured within each of the phases.

Allow 5 minutes to

Allow the interviewee to ask questions if anything is unclear before the questions are asked.

Allow 5 minutes

Interview questions: 22 questions in Allow 40 minutes **total**

1. Phase 1: Research enabling services during the Prepare phase

1.1 Environmental scanning	
1.1.1 How important do you think environmental scanning is to researchers and why?	Look for: Scale of importance and reasons for giving this answer
1.1.2 Do you think eRKC currently provides a high-quality environmental scanning service? Explain	Yes/No/I don't know Details of how the eRKC identifies gaps in research, provides background literature or finding experts on topics of interest
1.2 Spatial conceptualisation of a research topic	
1.2.1 How important do you think spatial conceptualisation is to researchers and why?	Look for: The scale of importance and reasons for giving this answer

1.2.2 Do you think the eRKC provides a high-quality spatial conceptualisation service? Explain	Yes/No/I don't know Details of how the eRKC assists in projects where spatial conceptualisation is needed.
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1.3 Identify research funding opportunities

1.3.1 How important do you think the identification of research funding opportunities is to researchers and why?	Look for: The scale of importance and reasons for giving this answer
1.3.2 Do you think the eRKC provides a high-quality service of identifying funding opportunities? Explain	Yes/No/I don't know Details of how the eRKC finds funding opportunities, Tools to use, finding grants, or private funds etc.

1.4 Training and orientation workshops on the services eRKC provides

1.4.1 How important do you think training and orientation workshops on the services provided by the eRKC are to researchers and why?	Look for: The scale of importance and reasons for giving this answer
--	---

2. Phase 2: Research enabling services during the Gather phase

2.1 Access to useful and high-quality information resources

2.1.1 How important do you think it is to researchers to have access to useful and high-quality information resources and why?	Look for: The scale of importance and reasons for giving this answer
2.1.2 Do you think the eRKC currently provides access to information resources at a high standard? Explain	Yes/No/I don't know Details about the various collections: print, e-resources, HSRC research outputs and data collections, and spatial information.

2.2 Guidance on data management planning and completing this plan

2.2.1 How important do you think data management planning is to researchers and why?	Look for: The scale of importance and reasons for giving this answer
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2.2.2 Do you think the eRKC provides a high-quality data management planning service? Explain	Yes/No/I don't know Details on DMP tools, HSRC DMP
---	---

2.3 Review Data Management Plans as part of the ethics application process in the HSRC

2.3.1 How important do you think reviewing data management plans as part of the ethics application process is to researchers and why?	Look for: The scale of importance and reasons for giving this answer
2.3.2 Do you think the eRKC provides the service of reviewing data management plans as part of the ethics application process at a high standard? Explain	Yes/No/I don't know Details on any knowledge of Ethics reviews and how it is done to assist researchers.

2.4 Consultations and support in the collection of field data

2.4.1 How important do you think consultations and support in collecting field data are to researchers and why?	Look for: The scale of importance and reasons for giving this answer
2.4.2 Are you aware that the eRKC provides this service of consulting and supporting field data collection?	Yes/No/I don't know
2.4.3 If yes in 2.4.2, Do you think the eRKC provides a high-quality service of consulting and supporting field data collection? Explain	Yes/No/I don't know Any knowledge of meetings with research groups/units about projects where data must be collected.

3. Phase 3: Research enabling services during the Create phase

3.1 Clarifying copyright and intellectual property rights	
3.1.1 How important do you think clarifying copyright and intellectual property rights are to researchers and why?	Look for: The scale of importance and reasons for giving this answer
3.1.2 Do you think the eRKC provides a high-quality service of clarifying copyright and intellectual property rights for researchers? Explain	Yes/No or I don't know Knowledge of copyright issues, IPR and assisting researchers with requests of this kind

3.2 Guidance on citation styles, citations and references when literature is sourced	
3.2.1 How important do you think guidance on citation styles, citations and references is to researchers and why?	Look for: The scale of importance and reasons for giving this answer
3.2.2 Do you think the eRKC provides a high-quality service in terms of guiding researchers when it comes to citation styles and reference management? Explain	Yes/No/I don't know Knowledge of citation styles, the reference manager tools available and assisting researchers with requests of this kind

3.3 Guidance on avoiding plagiarism	
3.3.1 How important do you think guidance on plagiarism is to researchers and why?	Look for: The scale of importance and reasons for giving this answer
3.3.2 Do you think the eRKC provides high-quality service in guiding researchers to avoid plagiarism practices? Explain	Yes/No/I don't know Knowledge of software such as Turnitin or iThenticate

4. Phase 4: Research enabling services during the Share phase

4.1 Updating professional information on author platforms	
4.1.1 How important do you think it is for researchers to have their professional	Look for: The scale of importance and reasons for giving this answer

information updated on platforms such as ORCID and why?	
4.1.2 Do you think the eRKC provides a high-quality service of updating the professional information of researchers on these platforms? Explain	Yes/No/I don't know Knowledge of platforms such as ORCID, LinkedIn etc. and what the eRKC is doing with these requests.

4.2 The use and implications of licensing, for example, Creative Commons Licences.	
4.2.1 How important do you think licensing is to researchers, for example, Creative Commons licenses and why?	Look for: The scale of importance and reasons for giving this answer
4.2.2 Are you aware of the eRKC currently assisting with licence use, as well as of any guidance on the implications of licenses to researchers?	Yes/No/I don't know
4.2.3. If yes in 4.2.2, Do you think the eRKC provides this service at a high standard? Explain	Yes/No/I don't know Knowledge of platforms such as Creative Commons Licences

4.3 Selecting suitable accredited journals to publish in	
4.3.1 How important do you think it is to provide researchers with suitable information on selecting accredited journals to publish in and why?	Look for: The scale of importance and reasons for giving this answer
4.3.2 Do you think the eRKC provides researchers with a high-quality service to	Yes/No/I don't know Knowledge of DHET accreditation lists and avoiding predatory publishers, NRF Rating

select suitable accredited journals to publish in? Explain	
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4.4 Raising awareness of open access as a publishing option	
4.4.1 How important do you think raising awareness of open access as a publishing option is to researchers and why?	Look for: The scale of importance and reasons for giving this answer
4.4.2 Do you think the eRKC delivers a high-quality service in raising awareness of open access as a publishing option? Explain	Yes/No/I don't know Knowledge of Open Access routes, assisting researchers with choosing the best open access option, predatory publishing

4.5 Sourcing publication funds for publications – use of for example the Article Processing Charges (APCs) funds within eRKC.	
4.5.1 How important do you think it is to researchers to have a service where funds for publishing are sourced or provided, and why?	Look for: The scale of importance and reasons for giving this answer
4.5.2 Do you think the eRKC provides this service to a high standard? Explain	Yes/No/I don't know Details of APCs or other fund sourcing and assisting researchers with these requests.

5. Phase 5: Research enabling services during the Preserve phase

5.1 Developing the research output repositories (data and publications) through accurate curation for storing, sharing and future use	
5.1.1 How important do you think the development of research output (data and publications) repositories are to researchers and why?	Look for: The scale of importance and reasons for giving this answer

5.1.2 Do you think the eRKC provides the service of repository development to a high standard? Explain	Yes/No/I don't know Knowledge of the institutional repository, the content that is included in the repository, ease of use, etc.
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5.2 Create applicable metadata for successful sharing and harvesting of research output (data and publications)

5.2.1 How important do you think applicable metadata creation for research output is to researchers and why?	Look for: The scale of importance and reasons for giving this answer
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5.2.2 Do you think the eRKC provides high-quality metadata in the research output and data repository? Explain	Yes/No/I don't know Knowledge of metadata standards used, how easy or difficult it is to find content etc.
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5.3 Long term preservation

5.3.1 How important do you think long-term preservation of research output is to researchers and why?	Look for: The scale of importance and reasons for giving this answer
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5.3.2 Are you aware that the eRKC currently provides long-term preservation of research output? Explain	Yes/No/I don't know Look for knowledge about the difference between storage and preservation
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5.4 Promotion of research publications and data sets

5.4.1 How important do you think it is to researchers to have their research output promoted why?	Look for: The scale of importance and reasons for giving this answer
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5.4.2 Do you think the eRKC currently promotes research publications and data sets to a high standard? Explain	Yes/No/I don't know Details of possible promoting activities such as the institutional repository, social media or other platforms
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6. Phase 6: Research enabling services during the Measure phase

6.1 Track the impact of researchers' output through Bibliometric analysis

6.1.1 How important do you think it is for researchers to track the impact of their research through Bibliometrics and why?	Look for:
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	The scale of importance and reasons for giving this answer. Specifically ask about h-indexes, NRF rating applications, citation analysis or others
6.1.2 Do you think the eRKC provides a bibliometric analysis at a high standard? Explain	Yes/No/I don't know Details of reports on these types of analyses done before, any further suggestions.

6.2 Track the impact of researchers' output through Altmetrics (alternative metrics) to determine the societal impact (Social media, blogs, newspapers and other online engagements)

6.2.1 How important do you think it is to researchers to track the impact of their research through Altmetrics and why?	Look for: The scale of importance and reasons for giving this answer. Ask specifically about the media, blogs, social media and other online engagements.
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6.2.2 Do you think the eRKC provides a high-quality service when using Altmetrics to promote research output? Explain	Yes/No/I don't know Details of previous attempts at using Altmetrics, using social media to promote data or publications etc.
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Open question

7. Please highlight any aspect related to the eRKC that you have not mentioned before, which you think can add value to this research.

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If you do not have anything to add or any further suggestions, this question will then be marked as N/A.

Thank you for your participation. Your input is valued and very much appreciated.

Ms Hanlie Baudin

APPENDIX C

INTERVIEW CONSENT FORM

Dear Participant

I am currently conducting research as part of my Master's degree in Digital Curation, under the supervision of Dr Patrick Mapulanga at the University of Cape Town (UCT). My study title is: Assessment of the eResearch Knowledge Centre's support practices in the Human Sciences Research Council in Pretoria, South Africa

The primary objective of this research study is to assess the support practices as provided by the eResearch Knowledge Centre (eRKC) in the Human Sciences Research Council.

This is an independent research study and is for academic purposes. Participation is voluntary, and respondents may choose to not answer specific questions or not to participate at all. Responses will be strictly confidential, and the anonymity of individuals is assured. Demographic questions will be asked but are not compulsory to complete.

The researcher will allocate One hour per interview, with an additional 15 minutes if needed. The interview will be held via Zoom at a time that is convenient for you. Data gathered will be anonymised by allocating an interview number to your name. The consent form, recording and any notes made during the interview will be stored in a secure environment for five years.

Statement of Agreement to Participate in the Research Study

- I hereby confirm that I have been informed by the researcher, Hanlie Baudin, about the nature and conducting of this study.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I am aware that the results of the study, including personal details regarding my position in the organisation, my level of education and my number of years'

service will be anonymously processed into a study report in such a way that it will not be possible to link my response to me.

- I understand that I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

I consent to participate in being interviewed for this study.

(Please click the applicable box.)

Consent given

Consent withheld

I further consent to my interview being recorded, using the audio recording functionality within Zoom.

(Please click the applicable box.)

Consent given

Consent withheld

Full Name of Participant Date Signature

I hereby confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Full Name of Researcher Date Signature

If you have any specific queries, or for clarity on any section, please do not hesitate to contact me:

Hanlie Baudin

Cell: 082 517 0855

E-mail: BDNJOH0112@myuct.ac.za

Or

Supervisor: Dr Patrick Mapulanga

Email: patrick.mapulanga@uct.ac.za

APPENDIX D

UNIVERSITY OF CAPE TOWN ETHICAL CLEARANCE



Department of Knowledge and Information Stewardship
University of Cape Town
Upper Campus
Private Bag X1, RONDEBOSCH, 7701 South Africa
Level 5 Hlanganani, Chancellor Oppenheimer Library
Tel: +27 (0) 21 650 4546 Fax: +27 (0) 21 650 2529
E-mail: dkis@uct.ac.za
Web: www.dkis.uct.ac.za

Ref. no.: UCTDKIS2021-12-11

04 March 2022

Dear Ms Baudin

The Ethics Review Committee of the Department of Knowledge and Information Stewardship has granted ethical clearance on behalf of the Humanities Faculty of the University of Cape Town for your Master's study entitled: *Assessment of the eResearch Knowledge Centre's support practices in the Human Sciences Research Council in Pretoria, South Africa*

You are reminded to seek further permissions from the Human Sciences Research Council before commencing with your data collection among its staff members.

I wish you well with your study.

Yours sincerely,

Michelle Kahn

Chair, Department (DKIS) Research Ethics Committee

APPENDIX E

HUMAN SCIENCES RESEARCH COUNCIL APPROVAL



14 March 2022

To: Ms Hanlie Baudin
Faculty: Department of Knowledge and Information Stewardship, Humanities Faculty
Student Number: UCTDKIS2021-12-11
E-mail: BDNJOH011@uct.ac.za

Copied to: Ms K Sithole, Manager: Research Governance, Ethics & Integrity

Dear Ms Hanlie Baudin

Gatekeeper approval for Protocol No 1-03-2022: Assessment of the eResearch Knowledge Centre's support practices in the Human Sciences Research Council in Pretoria, South Africa

I acknowledge receipt of the proposal outline for the abovementioned study and the informed consent document, as well as the provisional ethics approval granted by the University of Cape Town.

You are granted approval to undertake the said study in the HSRC, subject to the following conditions, as outlined in the HSRC's guideline document regarding gatekeeper approval.

Attached herewith for your ease of reference:

- (1) Potential respondents will have the right as individuals to decide whether they are willing to participate in the proposed study, or not, as per national ethics guidelines (2015) on informed consent.
- (2) Ideally, the identity of individual HSRC participants and that of the HSRC as a participating entity should be anonymised. Should you wish to publish the findings in a manner that renders the HSRC or participants identifiable, the draft final report should be submitted to the DCEO: R and if necessary, participants, for review and response before such publication is finalised or published.
- (3) You are required to submit a copy of the dissertation and any subsequent report or other publication that was based on the research, once completed and approved, to the DCEO: R for record-keeping purposes.

If you are in agreement with the above-mentioned requirements, please sign and return the response on the next page.

I wish you well with the proposed study.

Yours sincerely

Professor Heidi van Rooyen
Acting DCEO: R

HSRC Board: Dr Reginald Cassius Lubisi (Chairperson), Dr Kgomoiso William Kasonkole, Dr Deenadayalen Konar, Prof. Ibbo Day Joseph Mandaza, Ms Shamieme Manjoo, Dr Alex Mohubetswane Mashilo, Prof. Zerish Zethu Nkosi, Adv Faith Dikeledi Pansy Tlakula, Prof. Fiona Tregenna, Prof. Leickness Simbayi (Acting CEO)

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Tel: +27 33 324 5000 Fax: +27 33 324 1131

APPENDIX F
INTERVIEW SCHEDULE

Interviewee	Date	Time	Consent Form Received
Interviewee 1	Wednesday, 23 March 2022	11:00-12:15	Yes, Signed
Interviewee 2	Friday, 25 March 2022	09:00-10:15	Yes, Signed
Interviewee 3	Friday, 25 March 2022	14:00-15:15	Yes, Signed
Interviewee 4	Monday, 28 March 2022	11:00-12:15	Yes, Signed
Interviewee 5	Friday, 1 April 2022	09:00-10:15	Yes, Signed
Interviewee 6	Thursday, 12 April 2022	10:00-11:15	Yes, Signed
Interviewee 7	Thursday, 12 April 2022	12:30-13:45	Yes, Signed
Interviewee 8	Friday, 13 April 2022	09:00-10:15	Yes, Signed
Interviewee 9	Wednesday, 20 April 2022	09:00-10:15	Yes, Signed

APPENDIX G
CONFIRMATION OF EDITING

PO Box 1439
Wingate Park
0153

18 June 2022

Editing of Minor Dissertation: Mrs JM Baudin
Student Number: BDNJOH011

This letter serves to confirm that I have performed the English language editing on the Minor Dissertation to be submitted by Mrs JM Baudin in accordance with the requirements for the degree of Master of Philosophy (MPhil) in Digital Curation at the University of Cape Town and entitled:

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

While I am a permanent employee of the Directorate: Language Services at the University of South Africa in Pretoria – where I serve as an editor and translator – the editing of Mrs Baudin's research report was undertaken in my personal capacity.

Yours faithfully

CE Baudin
082 803 3355