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Challenges and strategies for open access in South Africa: A knowledge management approach

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Abstract

This paper explores the challenges of open access in South Africa and draws from knowledge management concepts and principles to suggest strategies to enhance open access. A comprehensive analysis of the existing literature was undertaken to address these challenges. A systematic review was undertaken to address the obstacles associated with open access using a well-defined search protocol. Some of the challenges were limited funding, inequality in access to technology, limited awareness, resistance from publishers, copyright issues, and lack of infrastructure. The article suggests that knowledge management initiatives such as knowledge awareness of open access, knowledge sharing, leadership, rewards and incentives, and a positive culture will enhance open access.

Keywords

information, knowledge management, knowledge sharing, open access, South Africa

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Introduction

Knowledge management and open access are essential for maximizing the use of information and knowledge, presenting enormous potential for knowledge systems and their application to society (Ali et al., 2020). The fundamental goal of knowledge management is to maximize the use and reuse of knowledge by systematically acquiring, organizing, describing, storing, sharing, and applying knowledge to enhance organizational performance (Bashir and Farooq, 2019). Similarly, open access aims to improve access to knowledge by making scholarly research and other types of knowledge available to the public without barriers such as paywalls or subscription fees (Pearce, 2022).

The Open Access movement has evolved from the need to record scholarly research-related content in peer-reviewed journals to the need for free and open distribution of diverse research products, such as datasets, grey literature, white papers, case studies, and databases (Stuart, 2015). The goal of open access is to provide unrestricted access to electronic content that may or may not be constrained by copyright and license restrictions. However, open access faces several challenges in South Africa.

Open access involves stakeholders consisting of groups and individuals who have a vested interest in the dissemination of scholarly research and knowledge. These stakeholders include researchers who benefit from increased visibility and impact (Pranckutė, 2021), funding agencies who require open access to ensure their investments benefit the public (McManus and Baeta Neves, 2021), libraries

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that benefit from reduced costs and up-to-date research, publishers who can profit from new business models (Björk and Solomon, 2012), policymakers who promote open access to drive innovation and economic growth (Kardos, 2012), and the general public who benefit from access to the latest research findings for informed decision-making and improved well-being (Gould et al., 2019).

Generally, knowledge management involves the integration of technology, people, and processes to create, store, share, and apply knowledge within an organization (Ode and Ayavoo, 2020). The definitions of knowledge management continue to evolve, incorporating various perspectives and emphasizing the importance of technology, culture, and knowledge sharing. However, at the core of all these definitions is the idea that knowledge is a valuable asset that can be managed to achieve institutional goals and gain a competitive advantage.

A solid technological platform is necessary for knowledge management to be successful. According to Schaefer and Makatsaria (2021), the integration of technologies such as artificial intelligence and big data analytics can enhance knowledge discovery, sharing, and utilization. This indicates that organizations must invest in the latest technological solutions to manage their knowledge effectively. Management must also support knowledge management initiatives actively. A study by Wen and Wang (2022) shows that top management's commitment and support are essential in fostering a culture of knowledge sharing in organizations. Effective leadership is necessary for facilitating knowledge creation and transfer in organizations.

Open-access journals in South Africa have grown considerably in recent years. The Directory of Open Access Journals (DOAJ) records around 79 OA journals produced in South Africa as of April 2018 (DOAJ, 2018). Additionally, South African OA repositories have increased, with 39 listed in the Directory of Open Access Repositories (OpenDOAR) as of July 2018 (OpenDOAR, 2018). This paper explores the challenges of open access in South Africa and suggests strategies to enhance open access by drawing from knowledge management concepts and principles. The paper highlights the concept of open access in South Africa and the challenges it faces and explores a perspective on knowledge management to improve open access. The paper introduces a new dimension to open access from a knowledge management perspective.

Literature review

Open access

The open access movement has evolved, initially due to the high costs of journal subscriptions for libraries and other institutions. In the traditional publishing model, publishers charge large fees for access to their journals, making it difficult for smaller institutions and developing countries to access the latest research (Pearce, 2022). The most comprehensive definition of open access draws from the Budapest Open Access Initiative (2002), the Berlin Declaration on Open Access to Knowledge in Science and Humanities (2003), the Bethesda Statement on Open Access Publishing (2003), and the Bangalore Open Access Commitment (2006). These declarations describe open access as granting users a free, irrevocable, worldwide right of access and a license to copy, use, distribute, transmit, and display scholarly work, as well as the right to create and distribute derivative works for any ethical purpose in any digital medium.

Open access provides an opportunity for researchers to communicate their findings publicly without having to pay article processing fees. The open access movement has resulted in a steady reduction of the access barriers that have for years prevented everyone from having free access to information (Nwagwu and Ojemeni, 2015). The benefits of open access include increased visibility and discoverability of research results, increased collaboration, and exchange of ideas, enhanced quality and efficiency of research, and increased global impact of research, education, and innovation. The advantages that come from making research articles available on the open internet free to read and download by anyone, anywhere in the world are enormous Open access publishing like knowledge management facilitates collaboration and peer review by allowing readers to see, comment on, and share research more easily.

Open access in South Africa

Unlike most African countries, South Africa has made significant strides in promoting open access, with policies and initiatives at both the government and institutional levels. The country has been commented on by UNESCO for its open access policies and grassroots initiatives in universities and research organizations (UNESCO, 2020). The South African National Library and Information Consortium (SANLiC) and the University of the Witwatersrand are signatories

to the international "Open Access 2020" campaign, launched in 2016 (SANLiC, 2020). As of January 2018, there were nine research entities with OA policies listed in the international Registry of Open Access Repository Mandates and Policies (ROARMAP) (ROARMAP, 2020).

According to the National Research Foundation's (NRF) Open Access Policy released in 2015, all publicly funded research outputs in South Africa must be made available in open-access repositories (NRF, 2015). This policy applies to both peer-reviewed journal articles and conference papers and requires that these outputs be made available within 12 months of publication. South Africa is also a signatory to the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, which commits the country to the principle that research should be made freely available online (Berlin Declaration, 2003).

The Department of Science and Innovation (DSI) has released a draft National Open Science Policy to promote open science practices, including open access (DSI, 2021). One of the most notable open-access initiatives in South Africa is the South African National Digital Repository (NDLTD), which provides free access to theses and dissertations from South African universities (SANLiC, 2020). The African Access Initiative (AAI) is another important initiative, which aims to increase access to African research outputs by providing funding for open-access publishing and supporting the development of open-access policies and repositories (NRF, 2015).

Generally, South Africa's open access initiatives have been successful in increasing the visibility and impact of research, and in promoting the principles of open science. However, there are still challenges to open access in South Africa. These include limited funding, inequality in access to technology, limited awareness, resistance from publishers, copyright issues, and lack of infrastructure to support open-access publishing. These challenges can limit the amount of research that is made open access and prevent researchers from taking advantage of the benefits of open access publishing.

Knowledge management

The knowledge and information of an organization are created, shared, used, and managed using a variety of techniques known as knowledge management (Girard and Girard, 2015). It alludes to a multidisciplinary strategy that makes the best use of information to accomplish organizational goals. Since 1991, knowledge management has been a recognized discipline that comprises classes in business administration, information systems, management, library science, and other related fields. Other disciplines, such as information and media, computer science, public health, and public policy, may contribute to knowledge management research.

Resources are devoted to internal knowledge management efforts by many large businesses, public institutions, and non-profit organizations, frequently as a component of their business strategy, information technology, or human resource management departments. These organizations receive knowledge management guidance from some consulting firms. Organizational goals including increased performance, competitive advantage, innovation, the sharing of lessons learned, integration, and ongoing organizational improvement are often the focus of knowledge management activities. Tactic knowledge and explicit knowledge are the major classification of knowledge (Gubbins and Dooley, 2021). To perform specific jobs, for example, someone may have internalized knowledge that they are not always conscious of. Explicit knowledge, on the other hand, is the knowledge that a person intentionally focuses on in their mind and delivers in a way that is understandable to others.

Although most of these initiatives overlap with organizational learning, they can be distinguished from it by a stronger emphasis on knowledge management as a strategic asset and on promoting knowledge exchange (Maier and Hadrich, 2011). Knowledge management makes organizational learning possible. The supply chain environment, which includes numerous organizations without an ownership tie or hierarchy between them, maybe the most challenging setting for knowledge management. Some authors refer to this situation as inter-organizational knowledge. As new problems arise from the volume and speed of information flows and knowledge development, the fourth industrial revolution and digital transformation also make things more complex (Holzinger et al., 2022).

According to this paradigm, implicit knowledge is 'extracted' to become explicit knowledge and then "re-internalized" into explicit knowledge (Baronian, 2022). The relational perspective acknowledges the contextual and relational features of knowledge which might make knowledge difficult to communicate

beyond the specific environment in which it is generated. The content perspective claims that knowledge is easily stored since it may be codified (Currie and Kerrin, 2003). Knowledge management needs to transform internalized tacit information into explicit knowledge to share it. Adesina and Ocholla (2020) indicated that knowledge management is needed to enable people to internalize and make personally relevant any codified knowledge recovered from the knowledge management endeavor. Later studies claimed that distinguishing between tacit and explicit knowledge was oversimplified and that the idea of explicit knowledge is incoherent.

Particularly, knowledge must be converted into information for it to be made clear (that is symbols outside our heads). A second framework for categorizing knowledge dimensions separates embodied knowledge, which is a learned ability of the nervous and endocrine systems of the human body, from embedded knowledge, which refers to knowledge that is part of a system outside of a human individual (for instance, knowledge may be embedded into the design of an information system). (Gubbins and Dooley, 2021). The transfer or exploitation of 'existing knowledge' within a group, organization, or community is distinguished from the exploratory creation of 'new knowledge' (that is innovation) in a third proposed paradigm (Hayes and Walsham, 2003). Both knowledge generation and knowledge transmission can be done in collaborative environments, such as communities of practice or the usage of social computing tools (Lim et al., 2014).

Knowledge management and information and communication technology

Information and communication technology (ICT) remains a crucial component of knowledge management in organizations (García-Sánchez et al., 2017). With advances in technology, new tools and systems are being used to support various aspects of knowledge management, such as creating knowledge repositories, building technical infrastructure for communities of practice, and accessing information on past projects (García-Sánchez et al., 2017). One of the significant technological advancements is artificial intelligence (AI), which has transformed the way knowledge is captured, organized, and presented. AI-based systems, such as chatbots and intelligent agents, are used to automate knowledge capture and retrieval processes, thus reducing human errors and saving time (Bughin et al., 2018).

Furthermore, machine learning algorithms are being used to analyze vast amounts of data to identify patterns and insights, thus facilitating better decision-making (Saura, 2021). Another area of advancement is the use of social media platforms for knowledge sharing and collaboration. Social media platforms such as LinkedIn, Facebook, and Twitter are being used to create communities of practice, where professionals can share knowledge, network, and collaborate (Cabrera et al., 2017). Moreover, organizations are using enterprise social media platforms such as Yammer and Slack to create virtual teams, thus facilitating collaboration and communication among team members (Pitafi et al., 2020).

Moreover, cloud-based technologies have facilitated knowledge management by providing a platform for storing and sharing knowledge across different locations and devices (Hashem et al., 2016). Cloud-based technologies provide flexibility and scalability, allowing organizations to access and share knowledge from anywhere, at any time (Yathiraju, 2022). ICT plays a vital role in knowledge management, and with advancements in technology, new tools, and systems are emerging that are changing the way knowledge is captured, organized, and presented. AI-based systems, social media platforms, and cloud-based technologies are some of the technological advancements that are being used to support knowledge management in organizations.

Knowledge management critical success factors

Knowledge management is essential for organizations to succeed in today's fast-paced and competitive business environment. This paper discusses some critical factors that are necessary for the success of knowledge management in any institution, particularly in academic institutions. It is updated with current references to provide the latest insights into the field. Encouraging a culture of knowledge sharing is crucial to the success of knowledge management. Developing a culture of trust and openness is essential for effective knowledge-sharing in organizations (Abu-Rumman, 2021). In addition, Al-Husseini et al. (2021) imply that creating an environment that fosters knowledge sharing is vital for enhancing organizational innovation. This indicates that organizations must work on creating a culture of knowledge sharing that is not only open but also conducive to innovation.

Rewards and incentives are also effective in encouraging knowledge sharing. Recent research by Thabit et al. (2022) indicates that financial and non-financial incentives, such as recognition and opportunities for personal development, can motivate individuals to share their knowledge. Furthermore, Hon et al. (2022) found that both internal and external rewards are effective in promoting knowledge-sharing behavior among employees. Recognizing ownership of knowledge is also a critical factor in the success of knowledge management. This shows that recognizing the ownership of knowledge is essential in fostering knowledge sharing and enhancing knowledge creation in organizations. Furthermore, recognizing knowledge ownership can enhance knowledge retention and facilitate knowledge transfer.

Knowledge management is critical to an organization's success in the competitive business environment today. Encouraging a culture of knowledge sharing, providing rewards and incentives, recognizing ownership of knowledge, investing in a solid technological platform, and actively supporting knowledge management initiatives are some of the critical factors that are essential for the success of knowledge management in any organization. Academic institutions should consider implementing these factors to manage their knowledge effectively and gain a competitive advantage in the education sector.

Materials and methods

A comprehensive analysis of the existing literature was undertaken to address the challenges of open access in South Africa, utilizing a knowledge management perspective. This systematic review aimed to compile a comprehensive summary while critically evaluating the available information. The primary goal was to uncover gaps in knowledge and inconsistencies in research findings, with the intention of guiding future research endeavors. By conducting this review, researchers aimed to attain a clear understanding of the current state of knowledge on the subject and pinpoint areas that warrant further investigation.

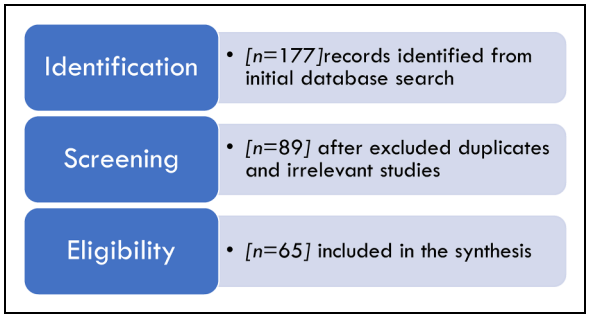

Figure 1. Search protocol flowchart.

A systematic review was undertaken in addressing the challenges of open access in South Africa from a knowledge management perspective, a well-defined search protocol was developed to ensure rigor and replicability. The search process extended from January to March 2023 and involved a thorough exploration of academic literature. The protocol encompassed the search strategy, inclusion and exclusion criteria and validation procedures. An extensive search was conducted across various databases, including but not limited to PubMed, Google Scholar, Scopus, and Web of Science. The search strategy employed a combination of keywords, Boolean operators, and MeSH terms, focusing on "open access," "challenges," "South Africa," and "knowledge management." Filters and limits were applied to retrieve publications within the specified timeframe.

The inclusion and exclusion criteria were meticulously defined to align with the research objectives. Studies published between 2011 and 2023 were included to capture the most current information. We encompassed a wide range of sources, including academic articles, books, and relevant publications, to ensure a comprehensive view of the subject. Studies were eligible if they directly addressed the challenges of open access from a knowledge management perspective. Studies that were not concerned with open access challenges were excluded and did not offer substantial insights into knowledge management aspects were excluded. Two independent researchers reviewed a random subset of the retrieved literature, and any discrepancies were discussed and resolved. In cases of divergence, the inclusion or exclusion decision was revisited, and consensus was reached. The validation process ensured the reliability and accuracy of study selection.

In South Africa, challenges in open Access, such as limited funding, infrastructure gaps, and resistance to change, contribute to knowledge gaps and inconsistencies in search findings. Strategies such as allocating funding, improving technology infrastructure, raising awareness, implementing institutional policies, providing training, fostering collaboration, offering incentives, and supporting advocacy groups can address these challenges. South Africa aims to promote open access practices, enhance research

dissemination, and reduce disparities in knowledge accessibility by implementing these measures.

Figure 1 above presents a visual flowchart outlining the step-by-step process from the initial database search to the final inclusion of studies. The process begun with a comprehensive database search, followed by the identification of initial records, which underwent screening to exclude duplicates and irrelevant studies. Eligibility assessment further narrowed down the selection, considering predefined inclusion and exclusion criteria. The final step involved data extraction, quality assessment, synthesis, and publication bias assessment as needed. Figure 1 offers a clear and structured overview of how studies were screened, evaluated, and included, ensuring transparency. A clear and step by step of the search protocol flowchart is as follow:

1. **Identification (Initial Database Search):**
   - **Number of Records (n = 177):** In the first stage, a comprehensive search of the initial database was conducted, resulting in the identification of 177 records related to the research topic.
2. **Screening (Exclusion of Duplicates and Irrelevant Studies):**
   - **Number of Records after Exclusion (n = 89):** Duplicates and studies deemed irrelevant to the research were removed during the screening process, leaving 89 records for further consideration.
3. **Eligibility (Inclusion in Synthesis):**
   - **Number of Records Included (n = 65):** From the screened records, 65 were found to be eligible and were included in the synthesis. These studies met the criteria outlined in the research protocol and were deemed relevant for the synthesis phase.

The flowchart demonstrated a systematic process from the initial identification of records through screening and ultimately to the inclusion of eligible studies in the synthesis. This approach ensured that only relevant and valuable information is considered for the study.

Findings and discussions

The open access movement in South Africa is confronted with various challenges that impede its progress. These challenges are significant barriers to the unrestricted dissemination of academic knowledge and research findings. Some of the notable obstacles include limited funding, inequality in access to technology, copyright issues, and limited awareness among scholars and researchers of the benefits of open access. Additionally, the absence of robust legal frameworks to govern open access practices and the dominance of commercial publishers in academic publishing further complicate efforts to advance the open access agenda in South Africa.

The table (*Table 1*) below delineates a range of challenges pertaining to open access in the realm of research and publication. First and foremost, the presence of restricted financial resources presents challenges in terms of financing publication fees and sustaining critical infrastructure. Moreover, the disparity in technology accessibility, particularly in rural areas, gives rise to a digital gap that has consequences for education and general progress. The limited knowledge among

Table 1. Open access challenges in South Africa

Challenges	Description
Limited Funding	Financial constraints hinder payment of publication fees and maintaining necessary infrastructure.
Inequality in Access to Technology	Uneven internet access, especially in rural areas, creates a digital divide impacting education and development.
Limited Awareness	Researchers lack awareness of open access benefits and guidance on how to make their work open access.
Resistance from Publishers	Traditional publishers resist open access due to business concerns, quality perception, and operational changes.
Copyright Issues	Copyright laws may not align with traditional knowledge ownership and community practices, posing complex issues.
Lack of Institutional Infrastructure	Many academic institutions lack policies, resources, and technical skills needed to support open access.

researchers regarding the advantages of open access and the requisite measures to ensure the accessibility of their work poses an additional obstacle to the advancement of scholarly endeavours. The opposition exhibited by traditional publishers can be attributed to various factors, including apprehensions over financial models, perceptions surrounding publishing quality, and a hesitancy to adopt operational modifications. The presence of sophisticated legal challenges arises due to the complex nature of copyright concerns, wherein the present rules may not be in accordance with the principles of traditional knowledge ownership and community practises. In addition, the lack of adequate institutional infrastructure, encompassing policies, resources, and technological expertise, poses obstacles to the effective execution of open access programmes. It is imperative to acknowledge and confront these problems in order to promote fair and inclusive dissemination of research. The following is an explanation of these challenges.

Limited funding

Limited funding and its impact on open access publishing in South African universities and research institutions have been extensively discussed in the literature (Simatele et al., 2021). The prioritization of research due to financial constraints has also been identified as a challenge that could impede scientific progress. Furthermore, the exclusion of valuable research from open access due to funding limitations has been highlighted as a potential negative consequence (Vitolla et al., 2019). These issues underscore the need for increased financial support for open access publishing in South Africa.

According to Suber (2012), limited funding can hinder the ability of authors to pay publication fees, thereby limiting the number of articles that can be made open access. Additionally, a lack of funding can result in a scarcity of resources for infrastructure, making it difficult for institutions to maintain the specialized infrastructure required for open access publishing (Cox and Pinfield, 2014). These factors can make it challenging to publish open access content, which could result in some research being excluded from the public domain (Smith et al., 2017).

Inequality in access to technology

Although South Africa has made progress in expanding internet access, there are still challenges in providing reliable internet connections, particularly in rural areas (World Bank, 2016). The report also highlights that the lack of access to technology can have significant consequences, including limited opportunities for education, communication, and economic development (World Bank, 2016). Similarly, a study by the Research and Innovation Management Centre at the University of Johannesburg notes that the digital divide in South Africa can exacerbate existing inequalities, making it harder for certain groups to participate fully in society and access important information and resources (Gwagwa et al., 2020).

Limited awareness

According to Suber (2012), many researchers are not aware of the benefits of open access publishing or do not understand how to make their work open access. This limited awareness can be attributed to the fact that open access publishing is still a relatively new concept in the academic world. Universities, research institutions, and funding bodies have failed to provide clear guidance or resources to researchers on how to make their work open access (Harnad, 2015), leading to a lack of communication and education on the topic.

Furthermore, some researchers may be hesitant to make their work open access due to concerns about the quality and prestige of open access journals. There is still a perception among some researchers that traditional, subscription-based journals are more prestigious and have higher impact factors (Price and Puddephatt, 2017). However, this perception is not entirely accurate, as many reputable open access journals exist.

Resistance from publishers

Some publishers may resist open access publishing models as they view it as a threat to their traditional business model (Price and Puddephatt, 2017). They fear that this model could decrease their revenue or even put them out of business. Moreover, they have invested heavily in developing their subscription-based models, and switching to open access publishing would require significant changes in their business practices, which may be difficult or costly. Price and Puddephatt (2017) also notes that some publishers may have concerns about the quality and credibility of open access publications. Although open access publications are often peer-reviewed, they are not

always published by established, prestigious journals. These concerns may further contribute to their reluctance to embrace open access publishing.

As of 2021, Springer Nature has established partnerships with over 500 universities worldwide, facilitating discounted Article Processing Charges (APCs) for authors. However, it is noteworthy that this collaboration is limited in South Africa, with only few universities, such as the University of Cape Town (UCT) and the University of South Africa (UNISA), currently availing such discounts (Zulu and Twum-Darko, 2023). Additionally, requests for individual waivers are evaluated on a case-by-case basis and may be approved in instances of legitimate need. This approach may pose challenges for researchers in South Africa seeking coverage for publishing charges due to their low income, as highlighted by Zulu and Twum-Darko (2023). The National Research Foundation provides essential funding for research and higher education institutions across the country, but there is a recognized need for additional support to meet the full requirements of the research community (Breetzke and Hedding, 2020).

Copyright issues

According to Jones (2019), traditional knowledge and indigenous languages in South Africa are often held collectively by the community, making it difficult to determine who has the right to control and use the knowledge and language. This can pose a challenge in terms of copyright ownership and control. Furthermore, copyright law may not always align with traditional cultural practices or beliefs, as some cultures may have customs that permit the sharing of certain knowledge freely among community members (Brekhus, 2015). As a result, publishing open access materials without infringing on intellectual property rights can be a complex issue in South Africa (Carroll, 2015).

Creative Commons licenses are legal instruments that empower creators to share some of their rights with the public while retaining others (Bello et al., 2016). These licenses are widely acknowledged and utilized to facilitate the open exchange of content. Many researchers are familiar with them but may lack the latest information on Creative Commons licenses in South Africa. Moreover, they might not realize that they can seek guidance from local legal resources, intellectual property offices, or legal experts in South Africa for any recent updates or alterations in the legal framework concerning Creative Commons licenses.

Lack of infrastructure

There is a lack of institutional infrastructure to support open access publishing in South Africa. According to Mutsvunguma (2019), the lack of institutional infrastructure to support open access publishing in South Africa is a major challenge for local researchers. They argue that limited awareness and understanding of the benefits of open access, coupled with a lack of institutional policies and resources, have hindered the adoption of open access publishing by many academic institutions in the country.

Additionally, technical challenges related to open access publishing platforms have also been noted as a barrier to adoption (Entsua-Mensah and Van Der Walt, 2022). The need for better technical support for these platforms has been highlighted, as many South African researchers and institutions lack the necessary skills and resources to effectively use them (Maphalala and Adigun, 2021). The technical requirements for open access publishing can be challenging for researchers and publishers who lack the necessary skills and resources. This includes issues related to formatting, metadata, and search engine optimization. Without adequate technical support, researchers may struggle to publish their work in open access journals.

Knowledge management strategies to enhance open access

Drawing from the concepts and theories of knowledge management discussed in the preceding section and the challenges to knowledge management, these sections suggest some knowledge management strategies to enhance open access among which are knowledge awareness, knowledge sharing, leadership commitment, rewards and incentives, and positive culture. These measures can contribute to the global movement towards open access and improve the visibility and accessibility of information.

Knowledge awareness. Using knowledge awareness as a knowledge management strategy to solve the open access problem involves several steps. Firstly, stakeholders must be identified, including researchers, publishers, libraries, funding agencies, and policymakers, each with different knowledge needs. The

development of a knowledge awareness campaign to promote open access can involve a range of stakeholders. Researchers and scholars can contribute by sharing their experiences of publishing open access articles and their benefits. They can also participate in webinars and workshops as speakers or panelists.

Librarians can organize training sessions and workshops for researchers and students to explain the open access publishing process and the available resources. Research funders can promote open access by mandating that research findings be made freely available. They can also provide funding to support the publication of open access articles. Publishers can develop open access publishing models and support the dissemination of research through various channels. Professional societies and associations can advocate for open access and support their members in publishing open access articles. Government agencies can develop policies that support open access and provide funding to support the dissemination of research findings.

The development of a knowledge awareness campaign can involve collaboration between these stakeholders to ensure that the campaign is effective in reaching its target audience. For example, researchers can provide feedback on the messaging and resources developed by librarians, while publishers can provide expertise on the publishing process. The campaign can also be tailored to specific groups, such as early-career researchers, to ensure that the information provided is relevant and accessible. Overall, the development of a knowledge awareness campaign to promote open access can involve a diverse range of stakeholders working together towards a common goal.

A knowledge-sharing platform, such as an online community, resource repository, or mentoring program, could also be created to facilitate sharing of knowledge and best practices. The knowledge-sharing platform could be created online, using various digital tools and platforms such as a website, a social media group, a forum, a blog, or a learning management system (LMS). The specific platform and tools used would depend on the nature of the community and the type of knowledge being shared.

For example, if the community is focused on a particular industry or profession, a dedicated website or forum may be more appropriate, while if the focus is on training and education, an LMS could be used. Ultimately, the choice of platform and tools would depend on the needs and preferences of the community members and the goals of the knowledge-sharing initiative. Lastly, metrics should be developed to measure the campaign and platform's impact, such as increased awareness, adoption of open access policies and practices, and collaboration among stakeholders.

Knowledge sharing. Collaboration among stakeholders is essential to promote and facilitate open access to research. Numerous collaborative platforms support this goal, including Open Access Button, OpenAIRE, Open Access Scholarly Publishers Association (OASPA), Coalition of Open Access Policy Institutions (COAPI), and Scholarly Publishing and Academic Resources Coalition (SPARC). These platforms bring together publishers, researchers, institutions, libraries, and other stakeholders to share best practices and advocate for the importance of open access policies. By engaging with these collaborative platforms, stakeholders can work together toward a more open and accessible research environment. Through these efforts, we can make research more widely available, increase its impact, and support scientific progress.

Open access repositories provide easy access to research findings, data, and publications, while collaboration platforms allow researchers to work together and share expertise. Policies can encourage researchers to share their knowledge openly by requiring open access publications, data sharing, and open-source software use. Open educational resources, such as textbooks and lectures, promote open access to knowledge for students and educators. Publishers should share the different platforms for universities, research institutions, and funding bodies to share their research findings, data, and publications openly.

Therefore, Stakeholders can collaborate on best practices for open access and advocate for open access policies. Collaboration amongst researchers through open access platforms can be particularly beneficial in the medical research field, where researchers can work together to share findings and data to develop new treatments. Platforms like the Open Science Framework can facilitate this collaboration, while policies can encourage researchers to publish their findings in open access journals or deposit their research data in open access repositories. Ultimately, collaboration among stakeholders can ensure that research findings are accessible to a wider audience and that the benefits of open access are realized.

Leadership commitment. Leaders who can address the open access problem include universities, research institutions, funding agencies, government bodies, libraries, and scholarly societies. They can take various actions to promote open access. Universities and research institutions can adopt policies that require researchers to make their research outputs, such as publications, data, and software, freely available. They can also invest in infrastructure, such as institutional repositories and open access journals, and provide resources and training to help researchers make their research outputs openly accessible.

Funding agencies can require grantees to make their research outputs openly accessible as a condition of funding. They can also support open access infrastructure and provide funding for publishing fees. Government bodies can enact policies that promote open access to publicly funded research, such as mandating that government agencies make their research outputs openly accessible. They can also invest in infrastructure and provide funding for publishing fees. Libraries can support open access by providing access to resources, promoting policies, and investing in infrastructure. Scholarly societies can promote policies and practices among their members and support infrastructure.

Leaders should make a strong commitment to open access and promote it as a core value. They should communicate the importance of open access to stakeholders, including researchers, faculty, students, and the general public. They should provide resources and support to help researchers make their research outputs openly accessible and work with stakeholders to develop and implement policies and infrastructure. By working together, leaders can ensure that scientific knowledge is freely available to all.

Rewards and incentives. The institutions that could incentivize open access and promote knowledge management include universities, research organizations, libraries, and funding agencies. These entities play a crucial role in the research ecosystem and have a significant stake in promoting open access. Universities and research organizations could provide financial rewards for publishing in open access journals and establish awards and recognition programs for researchers who make significant contributions to open access. They could also consider open access publications in promotion and tenure decisions, further incentivizing researchers to contribute to knowledge management.

Libraries could offer financial support for open access publishing and provide resources and training to researchers on how to publish in open access journals. They could also collaborate with publishers to negotiate more favorable open access publishing agreements for their institutions. Publishing houses could also benefit from incentives to promote open access. They could receive financial support from funding agencies and institutions to cover the costs of publishing in open access journals. Additionally, they could establish partnerships with universities and libraries to provide open access publishing services. Stakeholders can help shape strategies for incentivizing open access, to determine the most effective incentives for promoting open access, it is essential to engage with stakeholders, including researchers, funding agencies, publishers, and institutions.

A comprehensive and methodical analysis of the existing literature was undertaken to address the challenges of open access in South Africa, utilizing a knowledge management perspective. This systematic review aimed to compile a comprehensive summary while critically evaluating the available information. The primary goal was to uncover gaps in knowledge and inconsistencies in research findings, with the intention of guiding future research endeavors. By conducting this review, researchers aimed to attain a clear understanding of the current state of knowledge on the subject and pinpoint areas that warrant further investigation.

Initiating the process, researchers selected a pertinent research topic and conducted an exhaustive literature search spanning from January to March 2023. The search encompassed a wide array of sources, including academic articles, books, and other relevant publications. The amassed literature was subjected to rigorous evaluation and synthesis to identify prevalent themes, key discoveries, and areas lacking comprehensive understanding. The trajectory of this study was predominantly shaped by the analysis of 37 journal articles, 14 reports, and 11 recent articles, all published within the stipulated timeframe. The study involved a meticulous literature review encompassing a range of keywords: open access, challenges, South Africa, and knowledge management.

Positive culture. Open access affects stakeholders such as government agencies, research organizations, businesses, and the general public. For government agencies, it can improve transparency and accountability.

For research organizations, it can increase collaboration and innovation. For businesses, it can promote competitiveness. For the public, it can provide greater access to information and promote education, research, and innovation. Stakeholders can develop policies that promote transparency, openness, and collaboration. They can also provide training and resources to employees, partners, and customers. Additionally, they can work with open access organizations and communities to share best practices and develop new strategies for promoting open access. Open access requires a collaborative effort. By creating a culture of openness, transparency, and collaboration, and implementing policies and practices that support open access, stakeholders can promote knowledge sharing, innovation, and progress for all.

Conclusion

The surge of data and communication in modern times has the potential to significantly impact society, the economy, and science. It is therefore imperative for nations to upgrade their intellectual infrastructure to leverage the benefits and minimize the risks of this technology. South Africa must adapt to this shift while aligning with its broader socially conscious objectives and taking a leadership role. South Africa must establish an African Open Science Platform that enhances social, cultural, scientific, and economic development. Open access can support open innovation by ensuring scientific objectivity and reliability, integrating diverse data sources to address complex problems, and collaborating with stakeholders to solve shared issues. Individuals working in pioneering fields that support open access should embrace this movement as data sharing can enhance their credibility and promote the greater good of advancing research and knowledge sharing. A key challenge encountered during this review was ensuring that the literature search was sufficiently thorough and inclusive. This required the use of multiple search strategies and databases to provide assurance that all relevant literature was identified. Another significant challenge was the evaluation of the literature for quality and credibility, which involved careful consideration of various factors such as study design, sample size, and potential biases. The review was a vital step in the research process, providing researchers with a solid understanding of the current state of knowledge on addressing the challenges to open access in South Africa from a knowledge management perspective. The process also ensured that the research findings are well-informed and credible.

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