Mirrors of Knowledge and Indigenous Knowledge Management

2 authors:

De-Graft Johnson Amenuveve Dei
University of Ghana
35 PUBLICATIONS 258 CITATIONS

SEE PROFILE

Monica Mensah Danquah
University of Ghana
25 PUBLICATIONS 82 CITATIONS

SEE PROFILE

Mirrors of Knowledge and Indigenous Knowledge Management

De-Graft Johnson Dei 🆔
University of Ghana, Ghana

Monica Mensah Danquah
University of Ghana, Ghana

Abstract

This study assessed the role of mirrors of knowledge in the management and preservation of indigenous knowledge for sustainability and development in Ghana. The qualitative research design and structured interview were used in this study. The study focused on three categories of mirrors of knowledge: libraries (academic libraries, research libraries, special libraries, and public and community libraries), museums, and archive centers. Thematic content analysis was used to analyze the data collected via the interview. The study established that the managers and officers of the mirrors of knowledge understand and appreciate the concept of indigenous knowledge; there was the availability of technological systems and tools to facilitate the management and preservation of indigenous knowledge; and the mirrors of knowledge played a significant role in the management and preservation of knowledge. However, the absence of a collection development policy on indigenous knowledge; the outdated nature of most of the technological tools; the lack of funding; the lack of appreciation of indigenous knowledge by the staff and community members; etc. affected the quest to effectively manage and preserve indigenous knowledge for sustainable development. This study will serve as a guide for managers and policymakers of all the categories of mirrors of knowledge on the need, role, and importance of a collection development policy for indigenous knowledge, and guide in the identification and deployment of the appropriate technological systems for the management and preservation of indigenous knowledge. It will also inform the managers, policymakers, and stakeholders of indigenous knowledge of the challenges associated with the collection and management of indigenous knowledge and measures that can be deployed to help solve these problems for sustainability and development.

Keywords

Archive centers, indigenous knowledge, knowledge, libraries, mirrors of knowledge, museums

Introduction

Mirrors are important tools in the reflection of objects, images, and resources (Chen and Pan, 2022), and provide a textural and imagery feel, impression, or sight of objects, images, and resources (Ruggerone and Stauss, 2022). They reflect and highlight the beauty and relevance of resources such as information and knowledge resources. One major tool and institution for the reflection of knowledge and information resources are libraries, archives, and museums. Thus, libraries, archives, and museums are mirrors of knowledge that capture information and knowledge resources, objects, materials, artifacts, etc.; reflect, and highlight them for viewing, feeling, and accessibility for the sustainability and development of the society.

They serve as treasure troves of information and knowledge assets and resources such as indigenous knowledge resources (Trivedi, 2022). They consist of libraries, archive or records centers, and museums. Libraries, archives, and museums are certainly all aligned in the basic function of accumulation and preservation of information, much (but not all) of which concerns the past (Stauffer, 2021). Libraries serve as storehouse of books and other information and knowledge resources; archives

Corresponding author:
De-Graft Johnson Dei, Department of Information Studies, University of Ghana, Legon, Accra, Ghana.
Email: djdei@ug.edu.gh

and records centers are centers for collection of documents, records, and archival materials; and museums are institutions for the collection and management of objects, artifacts, and related knowledge resources (Rasmussen and Hjørland, 2023).

Thus, one of the core mandates of mirrors of knowledge is the capturing, documenting, processing, preservation, and dissemination of indigenous knowledge of indigenous (local and traditional) people, communities, states, and country is part of the core mandate of libraries and information centers. The indigenous knowledge is the understanding, skills, and philosophies developed by societies with long histories of interaction with their natural surroundings. For rural and indigenous peoples, local knowledge informs decision-making about fundamental aspects of day-to-day life. This knowledge is integral to a cultural complex that also encompasses language, systems of classification, resource use practices, social interactions, rituals, and spirituality (Cuaton and Su, 2020).

Mirrors of knowledge with relevant content will encourage communities and stakeholders to patronize them. Thus, they are in a good position to provide free and equitable access to all forms of knowledge since they are social service providers. They are traditionally the guardians of knowledge and cultural legacy; house drawings, paintings, and other documented objects like books, manuscripts, records, and audiovisual materials (Plockey, 2014).

The management and preservation of indigenous knowledge goes beyond either public libraries or academic libraries to include museums, archives, research libraries, and special libraries. There is the paucity of knowledge about the role the mirrors of knowledge (libraries, archives, and museums) in the management and preservation of indigenous knowledge. Again, in managing and preserving indigenous knowledge, issues such as the availability and role of collection development policy and information and communication technology cannot be undermined. This has been overlooked by most researchers. There is therefore the need to conduct a comprehensive study on the roles played by all the actors and mirrors of knowledge (libraries (academic, special, research, and community or public libraries), museums, and archives) in the management and preservation of indigenous knowledge toward the sustainability of communities in Ghana.

Specifically, the study sought to explore the officers and managers of the mirrors of knowledge (libraries and information centers') level of understanding of indigenous knowledge and the types of indigenous knowledge collated and managed; examine the role of the libraries and information centers in collecting and managing indigenous knowledge; assess the availability and role of collection development policy for the collection and management of indigenous knowledge; find out the roles of technology in the management and preservation of indigenous knowledge; and identify the challenges associated with the

management and preservation of indigenous knowledge by the libraries and information centers in Ghana.

Significantly, this study will serve as a guide for managers and policymakers of all the categories of mirrors of knowledge on the need, role, and importance of a collection development policy for indigenous knowledge. It will guide the identification and deployment of the appropriate technological systems for the management and preservation of indigenous knowledge. It will also inform the managers, policymakers, and stakeholders of indigenous knowledge of the challenges associated with the collection and management of indigenous knowledge and measures that can be deployed to help solve these problems. Finally, the findings will contribute to literature on indigenous knowledge and fill the gap in literature concerning the role of mirrors of knowledge in the management and preservation of indigenous knowledge in general, specifically, in Ghana.

Literature review

The concept of indigenous knowledge

Many researchers and practitioners have presented different definitions of the concept of indigenous knowledge. Indigenous knowledge is local information that is exclusive to a particular culture or civilization (Dei, 2024; Plockey, 2014; Prasetyo et al., 2023) and employed for the survival of a particular area (Afful-Arthur et al., 2022). Okenjom and Asuquo (2023) further posited that indigenous knowledge consists of a native group of activities that cover a wider range of aspects like language, norms, behaviors, farming, and healthcare systems held by indigenes for survival which is passed from generation to generation. Maltbie et al. (2023) provided a comprehensive definition of indigenous knowledge by indicating that it is a body of observations, oral and written knowledge, innovations, practices, and beliefs that promote sustainability and the responsible stewardship of cultural and natural resources through relationships between humans and their landscapes.

The World Bank Group (1998) developed the six phases of indigenous knowledge to include:

1. Recognition and identification, which in certain circumstances may be difficult and need sociological and technological studies;
2. Validation in terms of its applicability, dependability, functionality, and effectiveness;
3. Capturing and storing information using audiovisual technology, recorded narration, drawings, or other codifiable information given the intended use;
4. Storing information by categorizing, indexing, connecting it to other information, making it accessible, conserving, and maintaining it in the form of retrievable repositories for later use;

5. Transferring information by making it accessible to potential users for testing in the new environment;
6. Disseminating knowledge to the wider community through appropriate channels of communication.

The definitions expounded in the literature point out, identify, and outline some basic characteristics or elements that constitute indigenous knowledge. Prominently, indigenous knowledge is

1. Local, generated within communities, evolves in the local environment and is owned by the community members and the entire community;
2. Exclusive and unique to every culture, civilization, society, history, and environment, hence it is societal and culturally specific;
3. Mainly tacit, personal, based on experience, and intangible, therefore making it difficult to be codified while there exist explicit forms;
4. Bound by language, norms, behavior, farming activities, and healthcare system;
5. The basis for decision-making about agricultural practices, natural resource planning, human resource management, knowledge sharing, education, healthcare, lifestyle, conservation and environmental issues, and a host of other activities in communities.

Based on this, the study conceptualizes and defines indigenous knowledge as follows:

> knowledge that is local and based on the norms, behavior, customs, history, tradition, political, healthcare, economic, ecological, and environmental system of a particular group of people or community with extended interaction with nature and passed on from generation to generation using various forms of strategies and technologies to support decision making and problem-solving activities of the people, community, country, and the global world.

Mirrors of knowledge

A mirror is a reflective system that bounces off lights (Leibold and Sabat, 2019), objects and images (Yang et al., 2019), and information objects and resources (Ford, 1999). They produce and reproduce either a real image or a virtual image (Urey, 2011). When an object is placed in front of a mirror, the image of the same object or substance is seen in the mirror (Edgerton, 2009). They provide a textural and imagery feel, impression, or sight of objects, images, and resources (Katz, 2002; Leibold and Sabat, 2019). They reflect and highlight the beauty and relevance of resources such as information and knowledge resources (Edgerton, 2009). Libraries, archives, and museums as mirrors of knowledge thus serve as major tools and institutions for the reflection of knowledge and information resources.

These mirrors of knowledge must consider the big concerns related to the management and preservation of indigenous knowledge (Afful-Arthur et al., 2022). They must therefore view indigenous knowledge as a current body of pertinent knowledge, not just as a component of a historical archive. Although they haven't traditionally concentrated on these subjects, according to Baporikar (2022), they can help native people maintain and preserve indigenous knowledge by offering "resources and expertise in collection, organization, storage, and retrieval."

Libraries as mirrors of knowledge have concentrated on the selection and collection of documents, books, journals, and related information and knowledge resources; cataloguing, indexing, and classification them; and providing accessibility, searching, and retrieval of these information and knowledge resources (Asubiaro and Badmus, 2020; Dei and Asante, 2022). Archives as mirrors of knowledge focus on the management and preservation of documentary and historical materials and records, and preserves the original order so that the documentary and historical materials and records can be understood in their original context, giving room for users to interpret and analyze them in a multitude of ways (Ngoepe and Bhebhe, 2023). Museums are also institutions dedicated to the display and preservation of culturally significant objects, heritage, artefacts, among others (Chau et al., 2023). Whether library, archives, or museum, they all serve as mirrors of knowledge. Mirrors of knowledge are therefore seen as

> Institutions for the capturing, production, management, and preservation of information and knowledge resources, objects, materials, artifacts, etc.; reflect, and highlight them (of information and knowledge resources, objects, materials, and artifacts) for viewing, feeling, use, and accessibility for the sustainability and development of the society.

Mirrors of knowledge and indigenous knowledge management

Mirrors of knowledge have "emancipated themselves from the traditional resources of the written and printed word to incorporate other communication media and digital technologies" (Sithole, 2007). But if they are to contribute in any significant way to the documentation and dissemination of indigenous knowledge, Kempf (2023) notes that their function will need to be clearly defined. Hence, IFLA (2002) acknowledges the intrinsic value and importance of indigenous knowledge and the need to consider their preservation and management.

Mirrors of knowledge are therefore well-positioned to enable the management of information and knowledge resources, specifically, indigenous knowledge (Nakata and Langton, 2005), and offer chances for people in local communities to gain the information and knowledge required

(Sun et al., 2011) and to make informed decisions (Hayman and Smith, 2015) because of their focus on information and knowledge capturing, collection, processing, preservation, and dissemination (Khanyile and Dlamini, 2021). It has been noted that for the modern mirrors of knowledge to fulfill their social responsibility, they must facilitate easy retrieval and access to information and knowledge resources and assets (Sun et al., 2011) in any form, including oral, digital, and other media (Kempf, 2023; Plockey, 2014).

Libraries and information centers as mirrors of knowledge have improved information and knowledge collection, preservation, and dissemination (Plockey, 2014). By fostering a setting that allows for in-person forums and networking events to discuss indigenous knowledge, libraries, and information centers may encourage access to indigenous knowledge (Afful-Arthur et al., 2022). IFLA (2002), identified the role of libraries in the management and preservation of indigenous knowledge. These scholars assert that libraries could help in

a. Collecting, preserving, and dissemination of indigenous and local traditional knowledge;

b. Publicizing the value, contribution, and importance of indigenous knowledge to both non-indigenous and indigenous people;

c. Make available and promote information resources that support research and learning about indigenous knowledge, its importance, and its use in modern society;

d. Involve elders and communities in the production of resources and teach children to understand and appreciate the indigenous knowledge background and identity that is associated with indigenous knowledge system;

e. Encourage the recognition of principles of intellectual property to ensure the proper protection and use of indigenous knowledge products derived from it;

f. Urge governments to ensure the exemption from value-added taxes of books and other recording media on indigenous and local traditional knowledge;

g. Serve as custodians of indigenous knowledge; cultural heritage; and other information and knowledge products such as artifacts, historical manuscripts, paintings, music, maps, audio-visual items, records, books, etc.

To make all indigenous knowledge accessible, Asamoah and Ngulube (2023) suggested that libraries should move from their traditional function of gathering, maintaining,

and granting access to all materials with a scientific background and indigenous knowledge resources. To address the information demands of indigenous people and effectively manage indigenous knowledge, the library and information profession has a lot of roles to play (Asamoah and Ngulube, 2023; Nakata and Langton, 2005). These roles include the compilation of bibliographic annotation; facilitating access to indigenous knowledge in any form; compilation of thesauri and indexing terms; developing collection development policy; supporting research and being part of research initiatives and agenda; creating a database of indigenous knowledge; raising awareness in the community about the value of indigenous knowledge; record and share success stories of indigenous knowledge in songs, storytelling, plays, videos, and others; and protect the intellectual property rights of the community and individuals

Empirical review of indigenous knowledge management studies in Ghana

Afful-Arthur et al. (2022) examined the role of academic libraries, researchers of African studies, and stakeholders of academic libraries in managing and accessing indigenous knowledge for national development. The study established that academic libraries in Ghana have the necessary tools to handle indigenous knowledge, as a result, academic librarians must take the initiative and spearhead the management of indigenous knowledge and make it more accessible.

From the public library perspective, Plockey (2014) assessed the issues, prospects, and role of public libraries in the digitization of indigenous knowledge. The author indicated that ICT plays a major role in improving the availability of African indigenous knowledge. However, the perception of indigenous knowledge by missionaries, past colonial rulers, and Eurocentric intellectuals has created the impression that African indigenous knowledge is inferior, primitive, heathen, barbaric, and simply not worthy of preserving. To change this perception, the study advocated for the use of digital media by academic libraries for the management and preservation of indigenous knowledge, to make it visible for future and generational use.

Dei (2024) assessed the various sources, means, and strategies for accessing and sharing indigenous knowledge in local communities in Ghana. The study disclosed that indigenous knowledge which is mainly associated with traditional healers and birth attendants, farmers, religious leaders, clan heads, chief priests, chiefs, curators and information professionals, and opinion leaders, largely exists in oral form and is mainly orally and tacitly managed and shared. Coaching, mentorship, apprenticeship, training, and storytelling as strategies for managing and sharing indigenous knowledge usually take place at

shrines, churches, palaces, etc. Other strategies deployed include socialization, durbars, poem recitals, festival celebrations, cultural displays, film shows, exhibitions and displays, and outreach services. These strategies remain informal and undocumented.

Asamoah and Ngulube (2023) also explored the models for the management of indigenous knowledge in academic libraries of Ghana. It was evident from the study that the library services and programs did not reflect the content of knowledge management. They further indicated that policy guidelines, stakeholders' partnership, and integration of indigenous knowledge are instrumental for an integrated indigenous knowledge management system. Social inclusion of marginalized knowledge, equality, and sustainable development was identified and recommended in the effort to integrate indigenous knowledge management systems into the library's collection.

Sraku-Lartey (2021) focused on the importance and value of indigenous knowledge and how it is being threatened in today's modern world rather than being leveraged to catalyze development. Medicinal knowledge (human health, i.e., herbal medicine); sacred groves (geographic areas set aside to preserve plants and animals that can help to mitigate the impact of climate change); and living libraries (communities of people who are also holders of cultural wisdom and history and who are custodians of all knowledge relating to the history of their own community) were identified in the study as the three types of indigenous knowledge. The author makes a call to action, requesting that information professionals such as librarians and publishers, researchers, and scientists to collaborate for effective indigenous knowledge management.

Agyemang et al. (2019) investigated how knowledge management methods can be used to manage beads-making in Ghana. The study revealed that the socialization process of the knowledge creation model was intensively practiced in the beads-making communities to create and utilize knowledge, while the internalization, combination, and externalization processes were practiced at a low rate. The study recommended, among other things, the need for officials of community radio stations, especially state-owned radio and the information centers in the local communities, to develop and broadcast programs to disseminate information relevant to beads producers so that beads-making knowledge creation and development in the communities do not disappear, and that they should utilize storytelling, drama, traditional dance, and singing competitions in the local languages to support the preservation of indigenous beads making.

Kosoe et al. (2020) assessed how indigenous knowledge systems used sacred biological resources have resulted in the sustainability of resources in communities in Ghana. The study revealed that taboos and totems were key indigenous knowledge systems used in conserving biological resources. Whilst the traditional political institution plays out as custodians of the knowledge systems, sanctions in the form of fines, punishment, and banishment by the gods are used to deter local communities from flouting the indigenous knowledge system. However, religions (Christianity and Islam) education, and modernization emerged as key challenges threatening the sustainability of existing indigenous knowledge systems in Ghana.

Theoretical review

The von Krogh and Roos Model of Organizational Epistemology was employed for this study. The model by von Krogh and Roos on Organizational Epistemology developed in (1995) is the first model that clearly establishes the distinction between individual knowledge and social knowledge following an epistemological point of view regarding knowledge management. Thus, this model identifies the minds of the people or members of the organization or community and the relationship between the individuals and society. This model advocates the need and role of knowledge workers (librarians, curators, and information professionals) in the creation and dissemination of knowledge in the organization and community. Cristea and Căpăţînă (2009) disclosed that this model sought to identify some areas or aspects of knowledge that need to be analyzed to include "why and how the knowledge gets to the employees of a company; why and how the knowledge reaches the organization; what does it mean knowledge for the employee/organization; and what are the barriers for organizational knowledge management."

Knowledge creation according to this mode is perceived to be transformational and based on the experiences of people and community members been transformed into knowledge through dialog and dissemination. It promotes communication and collaboration between individuals and social actors. The cognitive components of this model support learning and knowledge acquisition and manipulation of knowledge for easy assimilation. In this perspective, the human brain and personality of people in any community or organization can be perceived as machines based on detections and logic which doesn't permit opposite declarations. So, organizations and communities gather knowledge from their environment or ecosystem which is processed logically. During the identification phase, the individual or community defines priorities for filtering knowledge and dissemination.

Again, this model identified five factors that could influence knowledge creation and dissemination in organizations or communities such as the employee, knowledge worker, or community members; communication skills; organizational structure (community structure); network or link between people or workers; and management of human resources. Contextually, if the community members are knowledgeable and perceive knowledge to be

relevant and useful to the community, the effect will be seen in their lifestyle and readiness to create and share knowledge. Also, if there is a common language to express and share ideas and knowledge, these challenges will be resolved. In the case where community members are willing to share experiences, it will be very easy to generate social cohesion and collaboration.

Methods

The qualitative research design was used in this study. The qualitative study enabled the researcher to understand and interpret the concept and study phenomenon by exploring the understanding experience of the respondents in relation to the subject matter, which is indigenous knowledge management and preservation by mirrors of knowledge (Khoa et al., 2023). Based on this, the researcher employed the structured interview which allowed the asking of participants to a set or list of questions that have been prepared in advance and in an orderly manner (Roberts, 2020). The use of the interview enabled the researcher to collect data from the respondents via in-depth interviews. Observation and document review were also deployed to augment the interview responses.

The study focused on three categories of mirrors of knowledge: libraries (academic libraries, research libraries, special libraries, and public and community libraries), museums, and archive centers. Three libraries were purposively selected from the academic, research, and special libraries categories (University of Ghana Library System, CSIR library, and Archeology Department Library), while five libraries were purposively selected from the public and community libraries categories (Ho Regional Library, Tema Community Library, Peki Library, Apegusu Community Library, and Takoradi Library). Three museums (Kwame Nkrumah Museum, Ho Regional Museum, and the Museum of Archeological Studies) and two archives and records centers (J.H. Kwabena Nketia Archives and University of Ghana Archives Systems) were also purposively selected. The researcher purposively selected the libraries, archives, and museums with the resources and structures to manage indigenous knowledge according to the supervisory bodies (Ghana Library Authority (GLA), Ghana Museum and Monument Board (GMMB), and the Public Record and Archives Administration Department (PRAAD)). Thus, from the three categories of mirrors of information, 13 different institutions of mirrors of knowledge were purposively selected by the researcher for this study. From each library, the head of the library or head of special collections on traditional, local, or indigenous resources, collections, or knowledge were selected as participants for the study. Lastly, the heads of the three museums and the archive center were also selected as participants. The purposive sampling enabled the researcher to gather in-depth data by

way of interviews with participants and respondents that were most likely and appropriate to provide useful and relevant data for the study (Islam and Aldaihani, 2022). Thus, 13 participants were sampled and served as the respondents for the study.

Thematic content analysis was used to analyze the data collected via the interview. This enabled the researcher to closely examine the interview data collected from the respondents and to identify common themes, ideas, and patterns of meaning that repeatedly came out. To avoid confirmation bias when formulating the analysis, the researcher deployed the six-step process: familiarization, coding, generating themes, reviewing themes, defining and naming themes, and writing up (Braun and Clarke, 2021; Byrne, 2022).

Findings

This section provides the analysis and findings of the study. It is organized based on the thematic areas of the research purpose or objectives: understanding the concept of indigenous knowledge, role of mirrors of knowledge in the management and preservation of indigenous knowledge, availability of collection development policy, role of ICT in the documentation and preservation of indigenous knowledge, and challenges associated with the collection and management of indigenous knowledge.

Understanding the concept of indigenous knowledge

Understanding the concept of indigenous knowledge is a major step toward appreciating, collecting, and preserving indigenous knowledge for present and generational use. The researcher thus enquired from the respondents if they could explain the concept of indigenous knowledge. Most of the respondents were able to explain indigenous knowledge with examples. The definition entails key features and characteristics of indigenous knowledge such as indigenous knowledge being local, traditional, and about a particular tradition, community, or locality; portraying the customs, tradition, and norms of a group of people; and having a relationship with nature and the ecosystems. Some of the respondents saw indigenous knowledge as a way of life, knowledge about the traditions, customs, norms, values, and history of a group of people or community, and living from the traditional perspective. Specifically, some indicated that

- Indigenous knowledge refers to knowledge that pertains to local people, their way of life, attitude, behavior, skills, experience, and resources of a community or country, and their relationship with each other and nature

- Indigenous knowledge consists of all the customs, history, traditions, norms, and values of a traditional area of a group of people in or of a country.

Others understood indigenous knowledge from the environment and ecosystem of the community. As posited by a participant

- Indigenous knowledge is the knowledge about the awareness and appreciation of the environment, nature, and ecosystem of a community or country.

Further, some of the respondents understood and sought to explain indigenous knowledge from the symbolic and tangible objects it (indigenous knowledge) has to offer from the traditional perspective. As a respondent indicated:

- Indigenous knowledge are the symbols, artifacts, sculptures, artworks, maps, songs, and ornaments portraying a particular culture or tradition.

Some of the respondents further demonstrated their level of understanding of indigenous knowledge by mentioning the types of ingenious knowledge kept in the mirrors of knowledge, clans or families, towns, and communities: songs, maps, artifacts, garments, ornaments, drawings, paintings, reports, thesis, manuscripts, and farming tools, among others. Specifically, some of the respondents mentioned the types of indigenous knowledge from the intangible perspective of indigenous knowledge such as the tradition, culture, belief system, indigenous people, history, festivals, and rites, among others.

Others also mentioned the types of indigenous knowledge by focusing on the tangibility nature of the indigenous knowledge. Even with this, some focused on indigenous knowledge as content such as recordings (poems, voice notes, and songs); reports about the environmental conservation, weather, and ecosystem of towns, communities, tribes, states, and regions; manuscripts of and concerning indigenous people and community such are chiefs, priests, religious leaders, political leaders; digitized materials of historical and traditional value to the community or country; and knowledge about farming practices, indigenous healthcare and medicinal practices, agricultural, fishing, harvesting, conservation practices, weather and environmental condition, among others. Other respondents focused on indigenous knowledge as objects or things such as maps, garments, and ornaments, sculptures, paintings, farming tools, rare books, artifacts. Other respondents mentioned natural objects, nature, and living things as constituting the types of indigenous knowledge such as trees, plants, forests, rocks, mountains, animals, rivers and water bodies, and scared grooves. Some of the respondents opine that

- Indigenous knowledge comprises the garments and ornaments worn by our patriots and warriors who fought for the liberation and freedom of our land are kept in the museum

- Indigenous knowledge consists of historical Maps of Ghana before, during, and after independence. The traditional maps and layout of traditional states in Ghana before the slave trade till present-day Ghana including the history of the division of Ghana into regions have all been collected and preserved in the library.

This explanation shows that the respondents understand the concept of indigenous knowledge which gives a positive sign for the study. It further shows that different types of indigenous knowledge resources are collected, managed, and preserved in the mirrors of knowledge.

Role of mirrors of knowledge in the management and preservation of indigenous knowledge

The respondents were asked to outline the roles that the mirrors of knowledge play in the management and preservation of indigenous knowledge. Their responses showed the mirrors of knowledge are key to the successful management and preservation of indigenous knowledge. Key among the roles mentioned by the respondents include: serving as a place for the preservation of information and knowledge resources; providing cataloged, classification, and preservation systems for indigenous knowledge management; supporting research activities; packaging indigenous knowledge and providing marketing avenues for the indigenous knowledge; collect artifacts, drawings, native songs, maps, weapons and dresses of our past warriors and chiefs, musical instruments used by our ancestors, and farming tools used by our forefathers; keep rare books, documents, reports, artifacts, and other information resources that are not readily available or cannot be found anywhere or any library and information center in Ghana; serve as a reference point for accessing historical and traditional information and knowledge; and conduct Information literacy and education programs to the citizens. Mirrors of knowledge as storehouses and places for the preservation and management of indigenous knowledge, some respondents put it

- Libraries serve as a place for the preservation of information and knowledge resources including indigenous knowledge items. Specifically, the library is the storehouse for our indigenous information created and collected. In the libraries, indigenous items such as reports, thesis, maps, rare books, historical materials, etc.

- The museums collect artifacts, drawings, native songs, maps, weapons, and dresses of our past warriors and chiefs, musical instruments used by our ancestors, and farming tools used by our forefathers for safekeeping.

As service providers, mirrors of knowledge provide cataloging, classification, and preservation systems for indigenous knowledge; packaging of indigenous knowledge and providing marketing avenues for indigenous knowledge; and providing educational and information literacy programs for the indigenous people. As posited by some of the respondents:

- The libraries play the role of conducting Information literacy and education programs to the citizens on the relevance of collecting, documenting, and preserving traditional and local content and knowledge assets. The information literacy and education program again seeks to encourage them to submit rare collections and indigenous knowledge items or resources to the libraries for safekeeping.

These responses show that libraries and information centers play key and vital roles in the management and preservation of indigenous knowledge.

Availability of collection development policy

The researcher enquired from the respondent whether there is a collection development policy to guide the staff and officers when selecting, acquiring, and building collections of indigenous knowledge for the library and information center. The general feedback showed that the libraries and information centers do not have a collection development policy for indigenous knowledge resources and items. Most of the respondents explicitly stated "No" indicating they do not have a collection development policy in place. Some of the responses from the respondents are:

- There is no collection development policy for indigenous knowledge collection and preservation. We depend on the general collection development policy for the library
- We are now working on a collection development policy.

Role of ICT in the documentation and preservation of indigenous knowledge

The researcher sought to find out from the respondents the role of technology or ICT in the documentation, archiving, and management of indigenous knowledge in the mirrors

of knowledge. Firstly, the respondents mentioned that the following technologies or ICT tools are available and can be used to capture, document, process, and preserve indigenous knowledge

> Mobile phones; Computers; Laptops; Scanners; Projectors; Photocopy machines; Camera; Servers; Internet; Television; ICT infrastructure; ICT center; Printer; External storage device; Bar code readers; Database; Audio and voice recorder; Repositories; Websites, and teleconferencing tools.

Despite the availability of these technological tools, most of the respondents indicated that these tools have some limitations in terms of use, usefulness, and obsolesce. This was equally the case as observed by the researcher when he visited the places for data collection.

The respondents further indicated that ICTs play a significant role in the capturing, documentation, processing, and preservation of indigenous knowledge. Most of them were of the belief that despite the obsolesce of the ICT tools/systems and in some cases, the absence of these ICT tools and systems, they (ICT) play a key role in their job and delivery of quality service. Some of the participants indicated that ICTs help in sending email and electronic information, collaborating with indigenes for sharing and disseminating indigenous knowledge of all kinds, and sending pictures and images with members of the community. As posited by one of the participants:

- We are able to use the email and internet facility to send emails and communicate with our colleagues and some patrons of the library. Some potential patrons send us emails requesting some documents and whether the documents are available for use or not.

It was further established that ICT promotes digital marketing and promotion of the resources and the center, digital curation, document encapsulation, scanning of documents, duplication of documents, video recording of objects and environment, display and projection of information and knowledge resources, and records storage either onsite or offsite. Some of the responses from the participants are as follows.

- We use the television to display the recorded traditional and historic events and activities for our visitors' viewing. These are all recorded and available videos in the library.
- We use the video recorder to record and archive all major traditional activities such as festivals, induction ceremonies, enstoolment of chiefs, and visits by historical and important people to our community among others

- We use the document encapsulator to preserve our documents by encapsulating them. They prevent users and patrons of the library from having direct contact with the records or documents.

These responses show that technologies play a significant role in the management and preservation of indigenous knowledge in mirrors of knowledge.

Challenges associated with the collection and management of indigenous knowledge

The respondents outlined several issues and challenges associated with the management and preservation of indigenous knowledge in the mirrors on knowledge. Most of the participants raised issues with a lack of funding and availability of financial support for the smooth operationalization of the mirrors on knowledge. Hence, they are unable to acquire ICT systems and tools, maintain the systems and facilities available

- There is inadequate funding to support our activities and the maintenance of the collections in the museum. Some of the materials need extra care and management. However, we just don't have adequate financial resources to support the management and preservation of these resources

Some participants also raised concerns about the lack of support from the local members to release their materials for preservation as most of the indigenes are keeping vital indigenous knowledge assets, items, or resources in their homes and refuse to release them to the mirrors of knowledge for safekeeping, which will ultimately lead to helping educate the present and future generations. The low level of interest in the patronage of the mirrors of knowledge, specifically, the museum section was also expressed as one of the challenges associated with the management and preservation of indigenous knowledge. This, they said demoralizes the collection of more materials for safekeeping.

Other concerns raised by the respondents include the absence of a collection development policy to guide the collection, selection, and management of indigenous knowledge in the mirrors of knowledge. The obsolesce nature of the available technologies and in some cases, the absence of technological systems to aid the management and preservation of indigenous knowledge was also mentioned. Again, some of the participants indicated that the management of indigenous knowledge requires some educational background, skills, and know-how which is missing among the staff at the mirrors of knowledge, particularly, the museums. This they said impedes the quest of the mirrors of knowledge to effectively manage

the indigenous knowledge items and resources. Other challenges raised have to do with the lack of space in the mirrors of knowledge to keep large indigenous knowledge assets and resources and the low maintenance culture of the mirrors of knowledge and the indigenous knowledge assets and resources. As some of the participants indicated:

- There is a lack of space to keep some of the materials. Look at some of these tangible items (machines and sculpture). These are big items that need bigger space for safekeeping

- There is a lack of maintenance culture among us the librarians. We must be responsible and maintain the materials accordingly. In saying this, some of the maintenance problems are external and have to do with funding, equipment, and support for the management of the resources. These external problems must also be dealt with for the proper maintenance of the indigenous knowledge resources.

These responses clearly show that despite the efforts by the mirrors on knowledge to collect, manage, and preserve indigenous knowledge, there are several challenges they encounter.

Discussions

Understanding the concept of indigenous knowledge is a major step toward appreciating, collecting, and preserving indigenous knowledge for present and generational use. The study established that most of the respondents were able to explain indigenous knowledge with examples. The definition by the respondents entails key features and characteristics of indigenous knowledge such as indigenous knowledge being local, traditional, and about a particular tradition, community, or locality; portraying the customs, tradition, and norms of a group of people; and having a relationship with nature and the ecosystems. The level of appreciation and value for knowledge and indigenous knowledge was displayed in the definition propounded by the respondents. The understanding of the concept of indigenous knowledge helps to a culture of collecting, processing, storage, dissemination, and preservation of indigenous knowledge by the mirrors on knowledge. These findings were expected from the staff of libraries and information centers whose core role is the collection, processing, storage, and dissemination of information and knowledge resources to their patrons and the general public. It is consistent with the findings of Dei et al. (2023) and Dei (2017).

This high level of understanding of the concept of indigenous knowledge by the respondents was again displayed with their identification of the types of indigenous

knowledge collated and preserved in the mirrors on knowledge. Key among the types of indigenous knowledge collated and preserved by the mirrors on knowledge were songs, maps, artifacts, garments, ornaments, drawings, paintings, reports, thesis, manuscripts, and farming tools, among others. This knowledge is presumed to translate into the actual management and preservation of the indigenous knowledge resources and materials under their care. These findings concur with von Krogh and Roos (1995) whose model advocates the need and role of knowledge workers (librarians, curators, and information professionals) with understanding in the creation and dissemination of knowledge in the organization and community. Cristea and Căpațînă (2009) also disclosed that this model sought to identify some areas or aspects of knowledge that need to be analyzed to include "why and how the knowledge gets to the employees of a company; why and how the knowledge reaches the organization; what does it mean knowledge for the employee/organization; and what are the barriers for organizational knowledge management."

Role of Libraries in the management and preservation of indigenous knowledge

IFLA (2020) highlighted the mandate of libraries toward the management and preservation of indigenous knowledge to include collection, recording and documentation, organization, preservation and storage, and dissemination and networking. The study supported IFLA's highlight and showed that the mirrors on knowledge were key to the successful management and preservation of indigenous knowledge. Key among the roles mentioned by the respondents include: Libraries serves as a place for the preservation of information and knowledge resources; providing cataloged, classification, and preservation system for indigenous knowledge; supporting research activities aiming at collecting, processing, preservation, and management of information resources and indigenous knowledge; packaging indigenous knowledge and provide marketing avenues for the indigenous knowledge; collecting artefacts, drawings, native songs, maps, weapons and dresses of our past warriors and chiefs, musical instruments used by our ancestors, and farming tools used by our forefathers; keeping rare books, documents, reports, artefacts, and other information resources that are not readily available or cannot be found anywhere or any library and information center in Ghana; serving as reference point for accessing historical and traditional information and knowledge; and conducting Information literacy and education programs to the citizens. This finding supports the findings of Anyira et al. (2010), Sithole (2007), Sarkhel (2017), and IFLA (2022). Sarkhel (2017) concludes that libraries and information professionals should therefore be proactive in devising strategies for the management and preservation of indigenous knowledge and ensure access to these valuable resources.

Availability of collection development policy

The study established the absence of a collection development policy to guide the staff and officers when selecting, acquiring, and building collections of indigenous knowledge for the mirrors on knowledge. The purpose of a collection development policy is to provide a clear and consistent framework and guidelines for decision-making about library collections and indigenous knowledge collection and management (IFLA, 2020). The absence of this therefore means the mirrors on knowledge have no clear framework and guidelines for collecting and managing indigenous knowledge. It will also impede the mirrors on knowledge's effort in strategic planning, policy formulation, and decision-making with regard to indigenous knowledge management and preservation. This also means that the mirrors on knowledge lack philosophy for collection, scope for collection, collation criteria, preservation strategies, and weeding process among others as stipulated by Disher (2023), IFLA (2020), and Chukwusa (2019).

Role of ICT in the documentation and preservation of indigenous knowledge

Technologies such as collaborative tools, the internet, intranet, knowledge servers, and computers, are enablers of knowledge management initiatives in organizations (Prusak & Davenport, 2013; Dei, 2017; Knoco, 2015). These assertion was evidenced in the study as the study established the availability of some technological systems such as Mobile phones; Computers; Laptops; Scanners; Projectors; Photocopy machines; Camera; Servers; Internet; Television; ICT infrastructure; ICT center; Printer; External storage device; Bar code readers; Database; Audio and voice recorder; Repositories; Websites; and teleconferencing tools to facilitate the capturing, documentation, processing, and preservation indigenous knowledge at the libraries and information centers. This finding supports the findings of Dei (2017) and Knoco (2020) who assert that information technology is an enabler of knowledge management activities and has provided a platform for building knowledge capital in organizations.

Despite the availability of these technological tools, most of the respondents indicated that these tools have some limitations in terms of use, usefulness, and obsolesce. This was equally the case as observed by the researcher when he visited the places for data collection. Adam, (2007) also established similar findings and encouraged organizations and the government to invest and acquire modern technological systems to aid the capturing, documentation, management, and preservation of indigenous knowledge and to impact the livelihood of indigenous communities in Ethiopia.

Despite the obsolesce of the ICT tools/systems and in some cases, the absence of these ICT tools and systems, the study revealed that ICT tools and systems played a key role in the capturing, processing, management, and preservation

of indigenous knowledge at the mirrors on knowledge. Key of these include ICT helping in sending email and electronic information, digital marketing and promotion of the resources and the center, digital curation, document encapsulation, scanning of documents, duplication of documents, video recording of objects and environment, display and projection of information and knowledge resources, and records storage either onsite or offsite. This finding supports Averweg and Greyling (2010) and Lodhi and Mikulecky (2011) who outline that ICT serves as a means to provide a range of platforms to disseminate and exchange indigenous knowledge via the use of social media; and facilitate the capturing and storage of indigenous knowledge in various forms including putting content on Internet web pages, which can be used for business purposes.

Challenges associated with the collection and management of indigenous knowledge

Despite the significant role of indigenous knowledge in the social, political, economic, and all aspects of the local economy and communities, libraries, and information centers face a series of challenges in the management and preservation of indigenous knowledge. The study established that most of the issues raised have to do with funding and availability of financial support for the smooth operationalization of the libraries and information centers, others raised concerns about the lack of support from the local members to release their materials for preservation. Other concerns raised include the absence of a collection development policy, absence and obsolesce technologies, lack of space, and low maintenance culture. These responses clearly show that despite the efforts by the libraries and information centers to collect, manage, and preserve indigenous knowledge, there are several challenges they encounter. These challenges identified align with other research findings such as Yeşil and Hırlak (2019), Laforge and McLachlan (2018), and Nadason et al. (2017). These challenges also corroborate the model by von Krogh and Roos (1995) on Organizational Epistemology which outlined that knowledge creation and dissemination in organizations or communities could be influenced by factors such as the employee, knowledge worker, or community members; communication skills; organizational structure (community structure); network or link between people or workers; and management of human resources.

Conclusion and recommendation

The study assessed the role of mirrors of knowledge: libraries, museums, and archive centers, in the management and preservation of indigenous knowledge toward the sustainability and development of communities in Ghana. The study established that the managers and officers of the mirrors of knowledge understand and appreciate the concept of indigenous knowledge. There was the availability of technological systems and tools to facilitate the capturing, processing, management, and preservation of indigenous knowledge. However, most of these technological tools were obsolete or out of use. Similarly, it was established that there was the absence of a collection development policy on indigenous knowledge in all the mirrors of knowledge. Despite this, the study established that the mirrors of knowledge played a significant role in the management and preservation of knowledge. The study finally established that the mirrors of knowledge are challenged by several factors in their quest to effectively manage and preserve indigenous knowledge.

Based on these findings, it is therefore recommended that

1. The managers and officers of the mirrors of knowledge should develop a policy on indigenous knowledge management collection.
2. The managers and funders of the mirrors of knowledge should dedicate more resources toward the purchase and deployment of modern and relevant technological systems or tools to aid the effective management of indigenous knowledge.
3. Special training and capacity building should be organized for all the staff to appreciate and value the uniqueness of indigenous knowledge and the role they play in decision-making and national development.
4. The officers and managers of indigenous knowledge should embark on community and public education and sensitization programs to educate the community and the public on the need to support and contribute their indigenous knowledge resources and assets to the mirrors of knowledge for safekeeping, management, and preservation.
5. The managers and officers should look for more sources or external sources of funding to raise enough funds and resources to support the effective operationalization of the mirrors of knowledge.

ORCID iD

De-Graft Johnson Dei (iD) https://orcid.org/0000-0002-8539-4058

References

Adam L (2007) Information and communication technologies, knowledge management and indigenous knowledge: Implications to livelihood of communities in Ethiopia. In: *A Workshop on "The Role of ICT in Preserving and Disseminating Indigenous Knowledge"*, Addis Ababa.

Afful-Arthur P, Kwafoa PNY, Ampah-Johnston M, et al. (2022) Managing and accessing indigenous knowledge for national development: The role of academic libraries in Ghana. *Information Development* 38(4): 535–548.

Agyemang BK, Ngulube P and Dube L (2019) Utilising knowledge management methods to manage beads-making indigenous knowledge among the Krobo communities in Ghana. *South African Journal of Information Management* 21(1): 1–9.

Anyira I, Onoriode OK and Nwabueze A (2010). The role of libraries in the preservation and accessibility of indigenous knowledge in the Niger Delta Region of Nigeria. *Library Philosophy and Practice* 387(6): 1–9.

Asamoah C and Ngulube P (2023) Exploring models for the management of indigenous knowledge in academic libraries of Ghana. *Information Development* 39(4): 787–797.

Asubiaro TV and Badmus OM (2020) Collaboration clusters, interdisciplinarity, scope and subject classification of library and information science research from Africa: An analysis of Web of Science publications from 1996 to 2015. *Journal of Librarianship and Information Science* 52(4): 1169–1185.

Averweg UR and Greyling EH (2010) Some challenges for information and communication technologies in indigenous knowledge preservation. *Journal of the Southern Africa Institute of Management Services* 19(11): 15–17.

Baporikar N (2022) Strategies to manage and preserve indigenous knowledge. In: *Handbook of Research on Protecting and Managing Global Indigenous Knowledge Systems*. IGI Global, pp. 207–222.

Braun V and Clarke V (2021) Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Counselling and Psychotherapy Research* 21(1): 37–47.

Byrne D (2022) A worked example of Braun and Clarke's approach to reflexive thematic analysis. *Quality & Quantity* 56(3): 1391–1412.

Chau KW, Davies SN, Lai LW, et al. (2023) Museums for ex situ tangible heritage conservation: A neo-institutional analytical and empirical economic analysis. *Land Use Policy* 127: 106561.

Chen B and Pan B (2022) Mirror-assisted multi-view digital image correlation: Principles, applications and implementations. *Optics and Lasers in Engineering* 149: 106786.

Chukwusa J (2019) Collection development models in academic libraries in South-South, Nigeria. *Regional Journal of Information and Knowledge Management* 4(2): 22–32.

Cristea DS and Capatina A (2009) Perspectives on knowledge management models. *Economics and Applied Informatics* (2): 355–366.

Cuaton GP and Su Y (2020) Local-indigenous knowledge on disaster risk reduction: Insights from the Mamanwa indigenous peoples in Basey, Samar after Typhoon Haiyan in the Philippines. *International Journal of Disaster Risk Reduction* 48: 101596.

Dei DJ (2017) *Assessing Knowledge Management Systems Implementation in Ghanaian Universities*. PhD diss.

Dei DJ (2024) Strategies for capturing, managing, and sharing indigenous knowledge. *Information Development*. Epub ahead of print 6 May 2024. DOI: 10.1177/02666669241248832.

Dei DJ and Asante FY (2022) Role of academic libraries in the achievement of quality education as a sustainable development goal. *Library Management* 43(6/7): 439–459.

Dei DJ, Kankam P, Anane-Donkor L, et al. (2023) Strategies for enrolment management in private universities in Ghana during the COVID-19 pandemic. *International Journal of Educational Research Open* 5: 100294.

Dei DJ, Kankam PK, Anane-Donkor L, et al. (2024) Knowledge repositories for managing knowledge in learning organizations. *Electronic Journal of Knowledge Management* 22(1): 1–13.

Disher W (2023) *Crash Course in Collection Development*. New York, NY: Bloomsbury Publishing USA.

Edgerton SY (2009) *The Mirror, the Window, and the Telescope: How Renaissance Linear Perspective Changed Our Vision of the Universe*. Ithaca, NY: Cornell University Press.

Ford CE (1999) Collaborative construction of task activity: Coordinating multiple resources in a high school physics lab. *Research on Language and Social Interaction* 32(4): 369–408.

Hayman R and Smith EE (2015) Sustainable decision making for emerging educational technologies in libraries. *Reference Services Review* 43(1): 7–18.

IFLA (2020) IFLA statement on indigenous traditional knowledge. Available at: https://www.ifla.org/publications/ifla-statement-on-indigenous-traditional-knowledge/

IFLA (2022) IFLA statement on indigenous traditional knowledge. Available at: https://www.ifla.org/publications/ifla-statement-on-indigenous-traditional-knowledge/

International Federation of Library Associations (IFLA) (2002) *IFLA Statement on Indigenous Traditional Knowledge*. IFLA/LAC Newsletter.

Islam MA and Aldaihani FMF (2022) Justification for adopting qualitative research method, research approaches, sampling strategy, sample size, interview method, saturation, and data analysis. *Journal of International Business and Management* 5(1): 1–11.

Katz M (2002) *Introduction to Geometrical Optics*. Singapore: World Scientific.

Kempf K (2023) Moving libraries toward digital transformation. *International Information & Library Review* 55(3): 233–240.

Khanyile NC and Dlamini P (2021) Preservation of traditional medicinal knowledge: Initiatives and techniques in rural communities in KwaZulu-Natal. *Library Philosophy and Practice* 1–19.

Khoa BT, Hung BP and Hejsalem-Brahmi M (2023) Qualitative research in social sciences: Data collection, data analysis and report writing. *International Journal of Public Sector Performance Management* 12(1–2): 187–209.

Knoco (2015) Knowledge management. Available at: https://www.nickmilton.com/2015/09/

Knoco (2020) Knowledge management. Available at: https://www.knoco.com/knowledge-management.htm

Kosoe EA, Adjei POW and Diawuo F (2020) From sacrilege to sustainability: The role of indigenous knowledge systems in biodiversity conservation in the Upper West Region of Ghana. *GeoJournal* 85: 1057–1074.

Laforge JM and McLachlan SM (2018) Learning communities and new farmer knowledge in Canada. *Geoforum* 96: 256–267.

Leibold J and Sabat RG (2019) Fabrication of micrometer-scale surface relief gratings in azobenzene molecular glass films using a modified Lloyd's mirror interferometer. *Optical Materials* 96: 109315.

Lodhi MS and Mikulecky P (2011, September) Motives and modes of indigenous knowledge management. In: *Proceedings of the 2nd International Conference on Urban Sustainability, Cultural Sustainability, Green Development, Green Structures and Clean Cars*. Prague, pp. 89–94.

Maltbie A, He CL and Ojeniyi OA (2023). The ethics of indigenous knowledge ownership and access in scholarly publishing. In: *45th SSP annual meeting*, May 31–June 2, 2023. ScienceOpen.

Nadason S, Saad RAJ and Ahmi A (2017) Knowledge sharing and barriers in organizations: A conceptual paper on knowledge-management strategy. *Indian-Pacific Journal of Accounting and Finance* 1(4): 32–41.

Nakata M and Langton M (2005) *Australian Indigenous Knowledge and Libraries*. Canberra: UTS ePRESS, p.188.

Ngoepe M and Bhebhe S (2023) *Indigenous Archives in Postcolonial Contexts: Recalling the Past in Africa*. Taylor & Francis.

Okenjom, G. P., & Asuquo, M. E. (2023). The Application of OAIS Model as a Framework for Digital Preservation of Indigenous Knowledge Systems: The Roles of Educational Managers. In *Digital Preservation and Documentation of Global Indigenous Knowledge Systems* (pp. 322–341). IGI Global.

Plockey FD (2014) The role of Ghana public libraries in the digitization of indigenous knowledge: Issues and prospects. *Journal of Pan African Studies* 6(10): 20–36.

Prasetyo N, Filep S and Carr A (2023) Towards culturally sustainable scuba diving tourism: An integration of Indigenous knowledge. *Tourism Recreation Research* 48(3): 319–332.

Prusak L and Davenport TH (2013) Knowledge after the knowledge creating company: A practitioner perspective. In: *Towards Organizational Knowledge: The Pioneering work of Ikujiro Nonaka*. London: Palgrave Macmillan UK, pp. 255–262.

Rasmussen CH and Hjørland B (2023) Libraries, archives and museums (LAMs): Conceptual issues with focus on their convergence. *KO Knowledge Organization* 49(8): 577–621.

Roberts RE (2020) Qualitative interview questions: Guidance for novice researchers. *Qualitative Report* 25(9).

Ruggerone L and Stauss R (2022) The deceptive mirror: The dressed body beyond reflection. *Fashion Theory* 26(2): 211–235.

Sarkhel JK (2017) Strategies of indigenous knowledge management in libraries. *Qualitative and Quantitative Methods in Libraries* 5(2): 427–439.

Sithole J (2007) The challenges faced by African libraries and information centres in documenting and preserving indigenous knowledge. *IFLA Journal* 33(2): 117–123.

Sraku-Lartey M (2021) Connecting the world through local indigenous knowledge. *Information Services & Use* 41(1–2): 43–51.

Stauffer SM (ed.) (2021) *Libraries, Archives, and Museums: An introduction to cultural heritage institutions through the ages*. Lanham, MD: Rowman & Littlefield.

Sun HC, Chen KN, Tseng C, et al. (2011) Role changing for librarians in the new information technology era. *New Library World* 112(7/8): 321–333.

Trivedi T (2022) Protection of traditional knowledge under the intellectual property rights regime with special reference to India. *International Journal of Law Management & Humanities* 5: 575.

Urey H, Chellappan KV, Erden E, et al. (2011) State of the art in stereoscopic and autostereoscopic displays. *Proceedings of the IEEE* 99(4): 540–555.

Von Krogh G and Roos J (1995) A perspective on knowledge, competence and strategy. *Personnel Review* 24(3): 56–76.

Yang X, Mei H, Xu K, et al. (2019) Where is my mirror? In: *Proceedings of the IEEE/CVF international conference on computer vision*, pp.8809–8818.

Yesil S and Hirlak B (2019) Exploring knowledge-sharing barriers and their implications. In: *Effective Knowledge Management Systems in Modern Society*. Igi Global, pp. 99–122.

World Bank Group (1998) Indigenous knowledge for development (English). Africa Region findings and good practice infobrief, no. 70, Washington, D.C. Available at: http://documents.worldbank.org/curated/en/403851468003569212/Indigenous-knowledge-for-development

Author biographies

Dr. De-Graft Johnson Dei holds a Ph.D. in Information Science from the University of South Africa; a Postdoc Research Fellow at the American University in Cairo, Egypt; a Senior Lecturer at the School of Information and Communication Studies, University of Ghana; and a Senior Research Fellow at KAAF University, Ghana. His research interest includes Library and Information Science, Blended and E-Learning, and Knowledge Management. Dr. Dei has consulted and successfully implemented library and information systems in several institutions in Ghana.

Dr. Monica Mensah Danquah is a Senior Lecturer at the Department of Information Studies, University of Ghana. Dr. Danquah is the Editor-in-Chief of the Ghana Library Journal; Vice Chair of IFLA-RDS SSA, and the Public Relations Officer and a member of the Newsletter management team for AFLIA, Library and Education Training Session. Her areas of academic interest include: modern trends in librarianship, open access and open science, digital libraries, sustainable development goals, Libraries and Agenda's 2030 and 2063