

DIGITAL MEDIATION OF INDIGENOUS KNOWLEDGE SYSTEMS IN EBONYI STATE: THE POLITICS OF REPRESENTATION AND COMMUNICATION IN THE AGE OF ICTS, AI AND BIG DATA

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Abstract

The study investigated digital mediation of Indigenous Knowledge Systems in Ebonyi State: The politics of representation and communication in the age of ICTs, AI and Big Data. Four research questions guided the study. The study adopted a descriptive survey design. The study was conducted in Ebonyi State, Nigeria, and the population comprised 150 participants who possessed relevant expertise in indigenous knowledge, digital technologies, cultural documentation and related areas. Purposive sampling technique was used to select the participants. Data were collected using the Digital Mediation of Indigenous Knowledge Systems Questionnaire (DMIKSQ). The instrument was validated by senior experts in the Department of Mass Communication, Alex-Ekwueme Federal University Ndufu-Alike, Ebonyi State, Nigeria. The reliability of the instrument was established using Cronbach's alpha, which yielded an overall reliability coefficient of 0.82, indicating satisfactory internal consistency of the instrument. The instrument was administered directly to the participants, and the data collected were analyzed using mean and standard deviation. A criterion mean of 2.50 was used as the decision rule, with mean scores of $\bar{X} \geq 2.50$ interpreted as Agree and mean scores of $\bar{X} < 2.50$ interpreted as Disagree. The findings showed that ICTs were used for documenting Indigenous Knowledge Systems in Ebonyi State, particularly for recording oral histories, indigenous languages, agricultural practices, medicinal practices, cultural images and digital archives. The findings also showed that AI was used for organizing, translating, classifying and presenting indigenous knowledge on digital platforms. In addition, Big Data was used for organising, analysing and communicating indigenous knowledge, while measures such as community participation, permission from knowledge holders, controlled access and prevention of unauthorized use were identified for protecting Indigenous Knowledge Systems. The study recommended among others that community custodians should be adequately trained in the use of digital technologies for documenting and communicating indigenous knowledge, while culturally sensitive safeguards should be integrated into AI and Big Data applications.

Keywords: Digital mediation, indigenous knowledge systems, artificial intelligence, big data,

Introduction

Indigenous Knowledge Systems (IKS) constitute the accumulated knowledge, skills, beliefs, values and practices developed by communities through prolonged interaction with their social, cultural and natural environments. Such knowledge is transmitted across generations through oral traditions, observation, apprenticeship, practical demonstration and participation in community life. In Nigeria and other African societies, indigenous knowledge is reflected in agriculture, traditional medicine, environmental management, crafts, textiles, indigenous languages, folklore, spirituality and systems of social organisation. Kukutai and Taylor (2016) described indigenous

knowledge as a cumulative body of knowledge, know-how, practices and beliefs developed by communities through long interaction with their environment. This understanding positions IKS as a living and dynamic body of knowledge rather than simply a collection of historical traditions. Its continued relevance is therefore connected to cultural identity, livelihood, environmental adaptation and community resilience.

In Ebonyi State, indigenous knowledge is deeply embedded in the social and economic activities of local communities. Agricultural practices involving soil management, crop production, seed selection, pest control and the cultivation of crops such as yam and cassava represent important areas of locally developed knowledge. Traditional medicinal practices, indigenous crafts, textiles, oral histories, festivals, masquerade traditions and indigenous languages also constitute significant dimensions of the state's cultural heritage. Onyemauwa et al. (2020) reported the importance of traditional ecological knowledge among rural farmers, particularly in relation to agricultural practices and environmental management. Similarly, indigenous cultural practices documented around institutions and communities in Ebonyi demonstrate the continuing relevance of local knowledge to cultural identity and community life. These forms of knowledge are frequently transmitted through interpersonal communication and practical participation, making their continuity vulnerable to social transformation, migration, urbanisation and declining intergenerational transmission. The increasing loss of indigenous languages and cultural practices has consequently generated renewed interest in the documentation and preservation of IKS. Adeyinka, Oluwayemi, and Ayodeji (2024) argued that rapid social and environmental changes have increased the urgency of documenting indigenous knowledge before important elements of community knowledge become difficult to recover. The challenge is particularly significant where knowledge is primarily transmitted orally and where younger generations increasingly rely on formal education and digital communication rather than traditional modes of knowledge transmission. In this context, digital technologies offer opportunities to complement existing community-based mechanisms of knowledge preservation.

Information and Communication Technologies (ICTs) have created new possibilities for documenting, storing, organising and communicating indigenous knowledge. Digital repositories, websites, mobile applications, social media, digital storytelling, audio-visual archives and online cultural platforms can be used to record oral histories, indigenous languages, traditional practices and community experiences. Adeyinka, Jatto, and Ajani (2025) examined the use of digital technology and artificial intelligence for preserving indigenous knowledge and highlighted the potential of digital repositories and interactive platforms for documenting and disseminating cultural knowledge. The digital environment can therefore extend the geographical and generational reach of indigenous knowledge by creating alternative spaces through which cultural information can be accessed and transmitted.

The use of digital media for indigenous language preservation further demonstrates this possibility. Tella, Oladokun, Olarongbe, et al. (2024) examined digital media technologies in relation to the sustainability and revitalisation of indigenous languages and highlighted the opportunities provided by digital communication for sustaining linguistic and cultural resources. Language is particularly important to IKS because many cultural meanings, classifications, expressions and practices are embedded in indigenous linguistic structures. When indigenous languages decline, important dimensions of cultural knowledge may also become difficult to communicate. Digital platforms can therefore provide opportunities for recording indigenous vocabulary, oral narratives, songs, stories

and other linguistic resources while creating new spaces for intergenerational communication.

Artificial Intelligence (AI) has introduced an additional dimension to this process. AI technologies can assist in language translation, speech recognition, information retrieval, classification of digital materials and the analysis of large collections of cultural data. Such applications may support the documentation of indigenous languages, medicinal knowledge, agricultural practices and environmental observations. However, the application of AI to indigenous knowledge also raises important questions concerning the quality and cultural adequacy of the data on which AI systems depend. If indigenous knowledge is poorly represented in training datasets, or if it is extracted without sufficient cultural context, AI systems may reproduce incomplete or distorted representations. Thus, the technological capacity to process indigenous knowledge does not necessarily guarantee accurate or culturally appropriate representation.

The emergence of Big Data has further transformed the ways in which knowledge can be collected, stored, analysed and communicated. Large datasets can potentially bring together information relating to indigenous languages, agricultural practices, medicinal plants, environmental observations, cultural expressions and historical experiences. This can support research, education and cultural preservation. However, the transformation of community knowledge into digital data can also detach information from the cultural relationships within which it originally developed. Knowledge that was previously communicated within particular community settings may become accessible to institutions, researchers, technology companies or other users beyond the original community. The process therefore raises questions concerning who determines what should be digitised, how it should be classified and who should have access to it. These concerns are closely connected to the politics of representation. Digital representation involves decisions concerning which aspects of indigenous knowledge are selected, how they are described and whose interpretation is presented as authoritative. Couldry and Mejias (2019) conceptualised data colonialism as a process through which human life becomes subject to forms of data extraction and appropriation. Applied to indigenous knowledge, this perspective draws attention to the possibility that digital systems can transform locally generated knowledge into resources controlled or interpreted by external actors. The concern is therefore not simply whether indigenous knowledge is preserved digitally, but whether the process of preservation respects the authority, context and interests of the communities from which the knowledge originates.

The issue of representation has also been discussed in relation to Indigenous Data Sovereignty. Kukutai and Taylor (2016) emphasised the importance of indigenous peoples exercising greater authority over data concerning their communities, identities and knowledge. The Global Indigenous Data Alliance (GIDA, 2019) subsequently advanced the CARE Principles, which emphasise Collective Benefit, Authority to Control, Responsibility and Ethics in data governance. These principles complement conventional approaches to data management by placing community interests and authority at the centre of data practices. Carroll et al. (2020) similarly demonstrated the relevance of the CARE Principles for ensuring that data practices are responsive to indigenous peoples and their collective interests. These frameworks provide useful perspectives for considering how digital documentation of IKS in Ebonyi State can be undertaken without unnecessarily transferring authority away from indigenous knowledge holders.

The question of ownership is equally important because indigenous knowledge is frequently collective rather than individually owned. Conventional intellectual property

frameworks may not adequately capture knowledge that has been developed and transmitted collectively over generations. World Intellectual Property Organization (WIPO, 2017) has highlighted the importance of protecting traditional knowledge and traditional cultural expressions within appropriate legal and policy frameworks. From this perspective, digital preservation must consider not only whether information can be stored and accessed but also whether communities retain appropriate rights over how their knowledge is reproduced, interpreted, distributed and commercially used. Communication constitutes another major dimension of digital mediation. Indigenous knowledge has traditionally been communicated through storytelling, songs, ceremonies, apprenticeship, practical demonstrations, symbols and community participation. Digital technologies create opportunities to extend these forms of communication through video, audio recordings, social media, digital archives and interactive platforms. However, wider circulation can also remove knowledge from its cultural context. A traditional practice that has a specific meaning within a community may acquire a different interpretation when presented to an external audience without adequate explanation. The challenge is therefore to develop digital communication practices that increase accessibility while maintaining cultural meaning and community authority.

United Nations Educational, Scientific and Cultural Organization (UNESCO, 2021) emphasized the growing importance of digital technologies and artificial intelligence in transforming cultural and knowledge environments, while also drawing attention to ethical considerations surrounding AI and digital transformation. In the context of indigenous knowledge, such considerations are particularly important because digital systems can determine what information becomes visible, searchable and reusable. UNESCO (2023) further emphasised the need to consider equity, inclusion and appropriate governance when technology is introduced into social and educational contexts. These perspectives reinforce the argument that digitalisation should not be treated merely as a technical process but as a social process involving questions of access, power, participation and responsibility. African scholarship also demonstrates that digital technologies can support the preservation and communication of cultural resources while facing limitations related to infrastructure, digital literacy, institutional capacity and access. Msafiri, Kangwa, and Cai (2023) noted the importance of institutional and contextual conditions in the successful integration of digital technologies. Although their study focused on ICT integration in secondary education, its emphasis on context and institutional support is relevant to indigenous knowledge digitisation because technological tools require appropriate human, institutional and infrastructural conditions to function effectively. In Nigeria, the Federal Ministry of Education (2023) has similarly recognised digital transformation as an important dimension of national development, although the application of digital technologies to indigenous knowledge requires additional attention to cultural governance and community participation.

The Nigerian context presents both opportunities and challenges. Digital platforms can provide new spaces for documenting indigenous agricultural knowledge, medicinal practices, oral histories, indigenous languages, crafts and cultural performances. At the same time, inadequate infrastructure, limited digital literacy, financial constraints and insufficient institutional frameworks may restrict the sustainability of such initiatives. Obiora and Uche (2024) highlighted the growing importance of ICT adoption for effective leadership and organisational practice in Nigeria, while the broader Nigerian literature on digital transformation suggests that access to technology alone does not guarantee meaningful or sustainable utilisation. For indigenous knowledge, the challenge is even

more complex because technological access must be accompanied by cultural sensitivity, ethical governance and community participation.

Regardless of the growing international interest in digital preservation, AI, Indigenous Data Sovereignty and cultural digitisation, there remains limited empirical attention to the specific ways in which ICTs, AI and Big Data are mediating indigenous knowledge in Ebonyi State. Existing studies have generally examined digital technology as a mechanism for preservation, language revitalisation or information access, while comparatively less attention has been given to the politics of representation and communication that emerge when community knowledge is transformed into digital data. There is therefore a need to examine who participates in the documentation process, whose interpretation is represented, how communities retain control over their knowledge and how digital technologies affect the communication of indigenous knowledge across generations. Hence, the study therefore examined digital mediation of indigenous knowledge systems in Ebonyi State, focusing on the politics of representation and communication in the age of ICTs, AI and Big Data. It specifically considered the opportunities presented by digital technologies for documenting, preserving and communicating indigenous knowledge, alongside concerns relating to ownership, representation, community participation, cultural integrity and data governance. By bringing these dimensions together, the study sought to contribute to a community-centred understanding of digital transformation in which ICTs, AI and Big Data can support the preservation and communication of indigenous knowledge without weakening the authority, identity and agency of the communities that generate and sustain it.

Statement of the Problem

The digital mediation of Indigenous Knowledge Systems has become increasingly important as communities seek to preserve, communicate and transmit their cultural knowledge in a rapidly changing technological environment. Ideally, indigenous knowledge should be documented and digitally preserved in ways that maintain its cultural meaning, recognise the authority of knowledge holders, protect community ownership and promote responsible intergenerational communication. Digital technologies such as ICTs, Artificial Intelligence and Big Data should provide communities with opportunities to document indigenous languages, agricultural practices, traditional medicine, oral traditions, crafts and other cultural expressions while ensuring that communities participate in decisions concerning the collection, interpretation, storage and use of their knowledge. However, the real situation presents several challenges. The increasing digitisation of indigenous knowledge can expose community knowledge to unauthorised collection, inappropriate representation, commercial exploitation and loss of cultural context. Digital platforms may make indigenous knowledge more accessible while simultaneously weakening the control of the communities from which such knowledge originates. Concerns about data extraction and data colonialism have consequently emerged, particularly where digital information is collected and processed without adequate attention to community authority and cultural rights (Coudry & Mejias, 2019). Similarly, the CARE Principles emphasise collective benefit, authority to control, responsibility and ethics in the governance of Indigenous data (Carroll et al., 2020). These concerns demonstrate that technological preservation alone does not guarantee culturally appropriate preservation.

In Nigeria, these challenges are compounded by inadequate digital infrastructure, limited digital literacy, insufficient institutional support and the predominantly oral nature of many indigenous knowledge systems. The use of digital media for indigenous language

and cultural preservation presents opportunities, but challenges relating to resources, institutional capacity and sustainable digital practices remain (Tella et al., 2024). The situation is particularly important in Ebonyi State, where indigenous knowledge remains embedded in agriculture, traditional medicine, indigenous languages, crafts, oral traditions and community cultural practices. Yet, much of this knowledge continues to depend on traditional modes of transmission and may be vulnerable to gradual loss as social, technological and generational changes continue. Furthermore, the increasing use of AI and Big Data introduces additional concerns about representation and communication. AI systems depend on the quality and nature of the data used to train and operate them. Where indigenous knowledge is inadequately represented in digital datasets, its meanings may be simplified, distorted or interpreted through perspectives that do not adequately reflect the communities that generated the knowledge. Similarly, the conversion of collectively held knowledge into digital data may raise questions about ownership, access, consent, control and benefit sharing. Without appropriate safeguards, technologies intended to preserve indigenous knowledge may instead contribute to the weakening of community authority over that knowledge.

Hence, the problem of this study, therefore, is that despite the opportunities provided by ICTs, AI and Big Data for documenting, preserving and communicating Indigenous Knowledge Systems, there is inadequate empirical understanding of how these technologies are representing, transforming and mediating indigenous knowledge in Ebonyi State, particularly regarding community participation, ownership, cultural integrity and control over digital representations. This gap makes it difficult to determine whether digital mediation is strengthening the preservation and communication of indigenous knowledge or creating new challenges for the authority and agency of indigenous knowledge holders.

Purpose of the Study

The purpose of the study was to examine digital mediation of Indigenous Knowledge Systems in Ebonyi State. Specifically, the study sought to:

1. examine the use of ICTs for documenting Indigenous Knowledge Systems in Ebonyi State.
2. examine the use of Artificial Intelligence for representing Indigenous Knowledge Systems in Ebonyi State.
3. examine the use of Big Data for communicating Indigenous Knowledge Systems in Ebonyi State.
4. examine measures for protecting Indigenous Knowledge Systems in Ebonyi State.

Research Questions

The following research questions guided the study;

1. What is the use of ICTs for documenting Indigenous Knowledge Systems in Ebonyi State?
2. What is the use of Artificial Intelligence for representing Indigenous Knowledge Systems in Ebonyi State?
3. What is the use of Big Data for communicating Indigenous Knowledge Systems in Ebonyi State?
4. What are the measures for protecting Indigenous Knowledge Systems in Ebonyi State?

Methodology

The study adopted a descriptive survey design. The design was considered appropriate because the study sought to obtain information from participants with relevant

knowledge and experience concerning the digital mediation of Indigenous Knowledge Systems in Ebonyi State. The study focused on the use of Information and Communication Technologies (ICTs) for documenting Indigenous Knowledge Systems, the use of Artificial Intelligence (AI) for representing Indigenous Knowledge Systems, the use of Big Data for communicating Indigenous Knowledge Systems, and measures for protecting Indigenous Knowledge Systems. The design enabled the researcher to obtain and analyze participants' responses on the issues investigated without manipulating the study variables. The study was conducted in Ebonyi State, Nigeria. The state provided an appropriate setting for the study because Indigenous Knowledge Systems remain embedded in areas such as traditional agriculture, traditional medicine, indigenous languages, crafts, oral traditions, cultural practices and community heritage. The study population comprised 150 participants who possessed relevant expertise in Indigenous Knowledge Systems, digital technologies, cultural documentation, communication and related areas. The participants included individuals with knowledge and experience considered relevant to the documentation, representation, communication and protection of indigenous knowledge in the context of emerging digital technologies. Purposive sampling technique was used to select the 150 participants. The technique was considered appropriate because the study required participants who possessed specific knowledge and experience relevant to Indigenous Knowledge Systems and their digital mediation. Thus, participation was based on the possession of relevant expertise rather than random selection from the general population.

Data were collected using a structured questionnaire titled Digital Mediation of Indigenous Knowledge Systems Questionnaire (DMIKSQ). The instrument was developed by the researcher based on the objectives and research questions of the study. The questionnaire was organised into sections covering the use of ICTs for documenting Indigenous Knowledge Systems, the use of AI for representing Indigenous Knowledge Systems, the use of Big Data for communicating Indigenous Knowledge Systems, and measures for protecting Indigenous Knowledge Systems. The items were structured on a four-point rating scale of Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). The instrument was subjected to face and content validation by senior experts in the Department of Mass Communication, Alex-Ekwueme Federal University Ndufu-Alike, Ebonyi State, Nigeria. The experts examined the instrument in terms of the clarity of the items, relevance to the study objectives, and adequacy of coverage, appropriateness of language and suitability of the response options. Their observations and recommendations were incorporated into the final version of the instrument before its administration.

The reliability of the Digital Mediation of Indigenous Knowledge Systems Questionnaire (DMIKSQ) was established using the Cronbach's alpha reliability method to determine the internal consistency of the questionnaire items and the extent to which they consistently measured the constructs covered by the instrument. The instrument yielded an overall reliability coefficient of 0.82, indicating satisfactory internal consistency and confirming that the questionnaire was sufficiently reliable for the study. For data collection, the researcher administered the questionnaire directly to the 150 selected participants with the assistance of appropriate contacts where necessary. The purpose of the study was explained to the participants, and the respondents were encouraged to provide responses based on their knowledge and experience. The completed questionnaires were retrieved, checked for completeness and prepared for analysis. The

responses obtained from the participants constituted the primary data used for answering the research questions.

The data collected were analyzed using mean and standard deviation. The mean was used to determine the extent of agreement with each questionnaire item, while the standard deviation was used to determine the degree of variation in the respondents' ratings. The analysis was presented in tables according to the four research questions guiding the study. The aggregate mean was also computed for each research question to provide an overall indication of the respondents' responses. A four-point rating scale was used to establish the decision criterion. The criterion mean was determined as 2.50. Consequently, mean scores of $\bar{X} \geq 2.50$ were interpreted as Agree (A), indicating that the item was accepted by the respondents, while mean scores of $\bar{X} < 2.50$ were interpreted as Disagree (D), indicating that the item was not accepted. The same criterion was applied to the aggregate mean for each research question, such that an aggregate mean of $\bar{X} \geq 2.50$ indicated overall agreement, while an aggregate mean of $\bar{X} < 2.50$ indicated overall disagreement.

Results

Table 1: Mean and Standard Deviation of Responses on the Use of ICTs for Documenting Indigenous Knowledge Systems in Ebonyi State

S/N	Item Statement	Mean ($\bar{X}$)	Std. Dev.	Decision
1	ICTs are used to record oral histories of indigenous communities.	3.42	0.61	A
2	ICTs are used to document indigenous languages and cultural expressions.	3.36	0.67	A
3	ICTs are used to document traditional agricultural practices.	3.31	0.70	A
4	ICTs are used to document traditional medicinal practices.	3.28	0.73	A
5	ICTs are used to preserve photographs and videos of indigenous cultural practices.	3.45	0.58	A
6	ICTs are used to store information on indigenous crafts and cultural activities.	3.33	0.68	A
7	ICTs are used to create digital archives of Indigenous Knowledge Systems.	3.39	0.64	A
Aggregate Score		3.36	0.66	A

Data in Table 1 showed that all the items recorded mean scores of $\bar{X} \geq 2.50$, indicating agreement among the respondents. The aggregate mean of $\bar{X} = 3.36 \geq 2.50$ further indicates that ICTs are used for documenting Indigenous Knowledge Systems in Ebonyi State. Item 5 recorded the highest mean ($\bar{X} = 3.45$), while Item 4 recorded the lowest mean ($\bar{X} = 3.28$). Thus, $3.28 \leq \bar{X} \leq 3.45$, indicating that all the items were above the criterion mean. The standard deviations ranged from 0.58 to 0.73, showing reasonable consistency in the respondents' ratings.

Table 2: Mean and Standard Deviation of Responses on the Use of Artificial Intelligence for Representing Indigenous Knowledge Systems in Ebonyi State

S/N	Item Statement	Mean ($\bar{X}$)	Std. Dev.	Decision
1	AI is used to organise digital records of indigenous	3.18	0.76	A

	knowledge.			
2	AI is used to support the translation of indigenous languages.	3.07	0.82	A
3	AI is used to classify digital materials on indigenous cultural practices.	3.12	0.79	A
4	AI is used to support the interpretation of indigenous cultural information.	2.96	0.86	A
5	AI is used to improve access to digital indigenous knowledge resources.	3.21	0.73	A
6	AI is used to organise audio-visual records of indigenous knowledge.	3.15	0.77	A
7	AI is used to support the presentation of indigenous knowledge on digital platforms.	3.24	0.71	A
Aggregate Score		3.13	0.78	A

Data in Table 2 showed that all the items obtained mean scores of $\bar{X} \geq 2.50$, indicating agreement with the listed uses of AI for representing Indigenous Knowledge Systems. The aggregate mean of $\bar{X} = 3.13 \geq 2.50$ confirms the overall agreement. Item 7 recorded the highest mean ($\bar{X} = 3.24$), whereas Item 4 recorded the lowest mean ($\bar{X} = 2.96$). Therefore, $2.96 \leq \bar{X} \leq 3.24$, and all the items satisfied the decision criterion. The standard deviations ranged from 0.71 to 0.86, indicating moderate variation in the respondents' ratings.

Table 3: Mean and Standard Deviation of Responses on the Use of Big Data for Communicating Indigenous Knowledge Systems in Ebonyi State

S/N	Item	Mean ($\bar{X}$)	Std. Dev.	Decision
1	Big Data is used to organise large collections of indigenous knowledge resources.	3.16	0.74	A
2	Big Data is used to analyse information on indigenous cultural practices.	3.08	0.79	A
3	Big Data is used to support dissemination through digital platforms.	3.22	0.71	A
4	Big Data is used to connect information from different indigenous knowledge sources.	3.11	0.76	A
5	Big Data is used to support access to indigenous knowledge for researchers and learners.	3.25	0.69	A
6	Big Data is used to identify patterns in indigenous language and cultural information.	3.05	0.81	A
7	Big Data is used to support wider communication of indigenous knowledge.	3.27	0.67	A
Aggregate Core		3.16	0.74	A

Data in Table 3 showed that all the items recorded mean scores of $\bar{X} \geq 2.50$, indicating agreement that Big Data is used for communicating Indigenous Knowledge Systems. The aggregate mean of $\bar{X} = 3.16 \geq 2.50$ supports this overall decision. Item 7 recorded the highest mean ($\bar{X} = 3.27$), while Item 6 recorded the lowest mean ($\bar{X} = 3.05$). Thus, $3.05 \leq \bar{X} \leq 3.27$, indicating that all the items exceeded the criterion mean. The standard deviations ranged from 0.67 to 0.81, indicating reasonable consistency in the respondents' ratings.

Table 4: Mean and Standard Deviation of Responses on Measures for Protecting Indigenous Knowledge Systems in Ebonyi State

S/N	Item Statement	Mean ($\bar{X}$)	Std. Dev.	Decision
1	Indigenous communities participate in decisions concerning the documentation of their knowledge.	3.29	0.68	A
2	Permission is obtained from knowledge holders before indigenous knowledge is digitally recorded.	3.17	0.75	A
3	Access to culturally sensitive indigenous knowledge is restricted where necessary.	3.12	0.79	A
4	Indigenous communities are informed about how their knowledge will be used digitally.	3.24	0.72	A
5	Digital records identify the communities from which indigenous knowledge originates.	3.31	0.66	A
6	Indigenous communities participate in decisions about sharing digital knowledge.	3.08	0.81	A
7	Measures are provided to prevent unauthorised use of indigenous knowledge.	3.20	0.74	A
Aggregate Score		3.20	0.74	A

Data in Table 4 showed that all the items recorded mean scores of $\bar{X} \geq 2.50$, indicating agreement that the identified measures are used for protecting Indigenous Knowledge Systems. The aggregate mean of $\bar{X} = 3.20 \geq 2.50$ confirms the overall agreement. Item 5 recorded the highest mean ($\bar{X} = 3.31$), while Item 6 recorded the lowest mean ($\bar{X} = 3.08$). Hence, $3.08 \leq \bar{X} \leq 3.31$, indicating that all the items met the acceptance criterion. The standard deviations ranged from 0.66 to 0.81, showing moderate consistency in the respondents' views.

Educational Implications of the Study

The study implies that ICTs, AI and Big Data can support the documentation, representation and communication of Indigenous Knowledge Systems in Ebonyi State. It also highlights the need for culturally appropriate digital practices, community participation and protection of indigenous knowledge from unauthorised use. Educational institutions should therefore integrate digital tools with indigenous knowledge education while promoting cultural integrity and responsible data use.

Conclusion

The study concluded that digital technologies provided important opportunities for documenting, representing and communicating Indigenous Knowledge Systems in Ebonyi State. The findings showed that ICTs were used for recording oral histories, indigenous languages, agricultural practices, medicinal practices and cultural materials. AI supported the organization, translation, classification and presentation of indigenous knowledge, while Big Data supported the organization, analysis, access and wider communication of indigenous knowledge resources. The findings further indicated that community participation, permission from knowledge holders, controlled access, identification of originating communities and measures against unauthorized use were important for protecting Indigenous Knowledge Systems. Overall, the findings demonstrated that effective digital mediation of indigenous knowledge requires the combined use of appropriate technologies, community participation and responsible protection of cultural knowledge.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Community custodians of Indigenous Knowledge Systems should be trained regularly in the use of ICTs for documenting, storing and communicating indigenous knowledge.
2. Educational institutions and relevant organisations should develop culturally appropriate AI applications that accurately represent indigenous languages, practices and cultural expressions.
3. Organisations involved in digital documentation should establish clear procedures for obtaining permission from indigenous knowledge holders before collecting and digitising community knowledge.
4. Government agencies and cultural institutions should strengthen measures for controlling access to culturally sensitive indigenous knowledge and preventing unauthorised use.
5. Indigenous communities should be actively involved in decisions concerning the documentation, representation, communication and sharing of their knowledge through digital platforms.

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