The Role of Digital Technology in Revitalization of Igbo Indigenous Knowledge System.

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Abstract

Indigenous knowledge which is traditions, cultural practices, languages and worldview of a particular set of people is at risk of fading due to globalisation, urbanization and shift in societal values. This study examines the role of digital technology in the revitalization of Igbo Indigenous Knowledge Systems (IIKS), using a qualitative theoretical approach grounded in digital technological determinism. The research draws data from secondary sources such as academic literature, online platforms, digital archives, and cultural repositories to explore how modern digital tools are being used to preserve and promote the Igbo language, traditional practices, oral history, and cultural identity. The findings reveal that digital technology significantly contributes to making indigenous knowledge more accessible to wider audiences, particularly younger generations and the Igbo diaspora. Platforms such as language-learning apps, online dictionaries, podcasts, YouTube channels, and digital storytelling tools are actively involved in the transmission of IIKS. These tools not only document cultural knowledge but also engage youth in dynamic ways, making indigenous knowledge relevant and appealing in the digital age. Based on these findings, the study recommends the expansion of digital infrastructure in Igbo-speaking regions, the development of culturally rich and linguistically relevant digital content, the implementation of digital literacy initiatives, and active collaboration with educational and cultural institutions. These measures are essential for sustaining and enhancing the role of digital technology in the preservation and revitalization of Igbo indigenous knowledge systems for current and future generations.

Keywords: Igbo indigenous knowledge, revitalization, digital technology

Introduction

Knowledge has been affirmed as power which brings development in every human endeavour that is useful for decision making. Indigenous Knowledge (IK) is home-grown and cultural knowledge of a specific society. It is a way of life, skills, experiences, culture, insight and values embraced by people in local community. Every society or community has her local knowledge which cuts across all aspects of human living on which livelihood and survival depend. These include but are not limited to health, fashion, food preparation, medicine and health care, education, agriculture, religion, festivals, recreation, norms and values, institutions, politics and technology.

Igbo Indigenous Knowledge Systems (IIKS) is a body of knowledge, or bodies of knowledge, of the indigenous people of Eastern geographical area of Nigeria that they have survived on for a very long time. These bodies are developed through the processes of acculturation and kinship relationships that societal groups form and are handed down to posterity through oral tradition, cultural practices like rituals, rites and so on (Chukwu, 2015; Okonkwo, 2012; Okoro, 2020).

Historically, IIKS were transmitted orally from one generation to the next, ensuring continuity of knowledge and reinforcing cultural cohesion within Igbo communities. Since IK is stored in people's memories and activities, it's dissemination is mainly through individual or communal expressions such as in stories, songs, folklore, proverbs, dances, myths, cultural values, beliefs, rituals, community laws, local languages, agricultural practices, equipment, materials, plant species and animal breeds .This early absence of a standardized written form of the indigenous language significantly hampered efforts to record and preserve these knowledge systems. As a result, much of the cultural wealth embedded in oral narratives and practices remains undocumented and vulnerable to extinction (Maluleka and Ngoepe, 2018; Ogar et al., 2020; Owolabi et al., 2022). Again, the declining use of indigenous languages, shifts in lifestyle, and limited formal documentation have further threatened the survival of IIKS in contemporary society in the face of globalization, urbanization and migration.
There is an urgent need for the younger generation to acquire and practice this body of knowledge that has been developed over generations through the process of human interaction and its continuity depends on its dissemination (Atteh 89). Dissemination of indigenous knowledge is very essential but it is embedded on documentation. Documentation sees to preservation of such knowledge in its complete raw form for posterity while dissemination focuses on encouraging access to the documented knowledge for planning and decision making. Arantes (2010) indicated that documentation, like any social practice belongs to a specific cultural universe and is guided by beliefs, codes and values that are not necessarily shared by communities whose heritage it portrays. Through documentation, one can explore whether solutions for a given problem can apply to a different country or time. Documentation makes it easy to share and is one way to preserve indigenous knowledge. Documentation of indigenous knowledge facilitates fixation of information for broad scrutiny and ownership by the writer.

A traditional knowledge may be lost forever, if it is not properly documented, analysed and disseminated. Mabawonku (2002) posits that indigenous knowledge dissemination should begin from the grass-roots level, i.e. with the originator or source of the information. This necessities the need for the local dwellers to have access to the most relevant and viable tools for documentation, archiving and dissemination of indigenous knowledge. In the digital era, indigenous knowledge can be in various formats to ensure its preservation, accessibility and dissemination. The format chosen depends on the nature of the knowledge, the preferences of their indigenous communities and the resources available, and this has implications for open science. Indigenous knowledge can be documented in the form of digital texts, audio recordings, video recordings, photographs, digital artifacts and objects, interactive multimedia, digital maps, digital archives and repositories, and digital exhibitions and online collections. Studies of Hunter (2005) ;Eke and Salawu (2025); Degboro and Olatunji (2022); Amadi (2023) confirm the viability of digital technology in revitalizing indigenous knowledge, their studies were not specifically on the Igbo indigenous knowledge systems as a whole therefore, the need to study the role of digital technology in revitalization of Igbo indigenous knowledge systems.

Literature Review

Indigenous Knowledge (IK)

Knowledge drives every aspect of human life existing everywhere and shaping how individuals interact with their environment. As people adapt to different surroundings, they develop unique ways of understanding and thriving, which eventually become part of their history. Indigenous

knowledge also called traditional knowledge, local knowledge, or rural people's knowledge refers to the collective wisdom of a specific group, often in rural areas, that guides their daily decision-making. It influences key aspects of life, including occupation, healthcare, agriculture, food preparation, and social structures (Aboyade & Adeyemo, 2019). According to Makwara (2013) IK covers the skills, philosophies, and understandings developed over time through deep interaction with the natural world. It plays a fundamental role in decision-making for indigenous and rural communities. Gaudry (2015) describes IK as a body of knowledge that reflects a community's identity, values, and history. Hill et al. (2020) further emphasize that it is deeply tied to a people's experience and rooted in their past. Adebayo & Adeyemo (2018) recognizes it as a framework that shapes culture, wisdom, expertise, and traditions within a society.

Igbo Indigenous Knowledge System (IIKS)

The Igbo indigenous knowledge systems (IIKS) encompass the traditional beliefs, practices, and wisdom developed by the Igbo people of Eastern Nigeria over generations. It covers various aspects of life, including agriculture, language, medicine, governance, trade, spirituality, and conflict resolution and is passed down orally through folklore, proverbs, rituals, and apprenticeships.

Agriculture in IIKS

According to Chukwu (2015), agriculture is the backbone of the Igbo economy, involving all members of society due to the region's fertile land. The Igbo land tenure system ensured equitable access to land, supporting farming, hunting, and fishing, which were deeply connected to cultural and spiritual beliefs. Agriculture played a key role in food security, cultural preservation, and sustainable land management. Chukwu suggests that combining traditional farming methods with modern techniques could further enhance agricultural productivity in Igbo land.

Traditional Medicine in IIKS

For generations, Igbo traditional medicine has been essential in community healthcare, using native plants for healing. This knowledge, passed down orally, reflects the belief that nature provides remedies for ailments (Okonkwo, 2012). The World Health Organization (WHO, 1978) defines traditional medicine as indigenous knowledge used for maintaining health and treating diseases. Herbal practitioners (dibias)play central roles in healing practices. Okwu and Josiah (2006) highlight that medicinal plant use is an ancient tradition, promoting biodiversity preservation and holistic healing, which considers physical, spiritual, and emotional well-being.

Environmental Conservation and Igbo Cosmology in IIKS

Okoro (2020) explains that Igbo ancestors followed an environmentally conscious philosophy rooted in their spiritual beliefs. They regarded water, forests, land, and animals as sacred, preventing environmental exploitation. Sacred sites helped in biodiversity conservation, fostering a harmonious relationship between humans and nature. Igbo cosmology also recognizes the influence of spirits, particularly marine spirits, in protecting natural elements like water. These spiritual beliefs encouraged environmental stewardship, reinforcing the importance of sustainable resource management.

The rise of globalisation and urbanisation has led to a decline in the Igbo language, weakening the transmission of oral traditions and folklore. Younger generations are increasingly adopting foreign languages and cultural practices, reducing their connection to indigenous knowledge. Western education and modern medicine have also contributed to the decline of traditional healing practices, making it difficult for traditional healers to pass down their expertise. Therefore, it is imperative to integrate Igbo traditional wisdom with modern innovations while ensuring that future generations remain connected to their cultural heritage.

Digital Technology

Digital technologies refer to devices such as personal computers and tablets, cameras, calculators and digital toys, systems such as software and apps, augmented and virtual reality, and less tangible forms of technology such as the Internet. It encompasses a broad spectrum of tools, systems, and devices that process, store, or transmit data in digital form. Digital technology refers to electronic tools, systems, devices, and resources that generate, store, or process data (Johnstone et al 2023). These technologies encompass wide range of applications, including but not limited to computing devices, communication tools, and software applications. The scope of digital technology is broad, covering everything from basic hardware and software to advanced innovations in artificial intelligence (AI) and virtual reality (VR). Digital technology has revolutionized the way we communicate, learn, and interact. It offers new possibilities for knowledge development and preservation.

Types of Digital Technologies

Digital technologies include a broad spectrum of tools and platforms that contribute to various aspects of daily life, education, communication, and cultural preservation. Some of the key types of digital technologies relevant to this paper will be listed and explained:

Internet and Social media: The internet and social media have transformed how people access and share information, offering powerful tools for communication and cultural preservation. The internet connects devices globally, allowing fast data exchange (BasuMallick, 2023), while social media enables users to share content and build communities. Platforms like Facebook, Twitter, Instagram, and YouTube support language promotion by fostering online spaces where users can interact in their native tongues and access educational materials. For example, YouTube channels and Facebook groups can be used to teach and promote the Igbo language to a worldwide audience (Britannica, 2021).

Mobile Applications: Mobile applications (apps) are software programs designed to run on smartphones and tablets. They offer a convenient and accessible way for users to engage with content on the go. Language learning apps such as Duolingo, Babbel, and Memrise have revolutionized the way people learn new languages by providing interactive lessons, quizzes, and games. For Igbo language development, dedicated mobile apps can offer vocabulary training, pronunciation guides, grammar lessons, and cultural insights, making language learning more engaging and effective (Kukulska-Hulme, 2012).

E-learning Platforms: E-learning platforms provide structured online courses and educational content. Platforms like Coursera, Udemy, and Khan Academy offer a wide range of courses, including language learning. These platforms can be used to create comprehensive Igbo

language courses that cover various proficiency levels, from beginner to advance. E-learning platforms often include features such as video lectures, interactive exercises, forums for discussion, and assessments. These features make them ideal for systematic language instruction (Means et al., 2013).

Artificial Intelligence and Machine Learning: Artificial intelligence (AI) and machine learning (ML) involve the development of algorithms and systems that can perform tasks that typically require human intelligence. These technologies can significantly enhance language learning and preservation efforts. AI-powered language tools, such as chat bots and virtual assistants, can provide instant translation, language practice, and personalized learning experiences. Machine learning algorithms can analyze vast amounts of linguistic data to improve speech recognition, natural language processing, and predictive text functionalities (Russell & Norvig, 2020), and these makes them valuable resources for developing sophisticated Igbo language applications

Virtual reality (VR) and augmented reality (AR) :Virtual reality (VR) and augmented reality (AR) are immersive technologies that create simulated environments or overlay digital information onto the real world. These technologies offer innovative ways to engage with language learning. VR can provide immersive language learning experiences by placing users in virtual environments where they can practice speaking and listening in contextual scenarios. AR can enhance language learning by overlaying translations, pronunciations, and cultural information onto real-world objects through mobile devices or AR glasses. These technologies can make learning the Igbo language more interactive and contextually relevant (Freina & Ott).

Empirical Studies

Several empirical studies highlight the intersection between digital technology and the preservation of indigenous knowledge systems.

Hunter (2005) explores the critical role of information technologies in managing indigenous knowledge, particularly through Indigenous Knowledge Centers (IKCs). The study emphasizes how digital tools and open-source software can be leveraged to document, protect, and disseminate traditional knowledge while empowering communities and safeguarding cultural heritage. Although Hunter's work takes a broader global perspective, its relevance to the Igbo context lies in its demonstration of how digital infrastructure can support localized knowledge revitalization efforts.

In the Nigerian context, Eke and Salawu (2025) investigate how digital media, especially BBC News Igbo, facilitates the intergenerational transmission of the Igbo language. They found that such platforms enhance language visibility, promote cultural pride, and engage younger audiences who may lack exposure to traditional oral transmission. This aligns closely with the current study’s objectives, though their focus is more on language promotion, whereas the current study encompasses a wider range of Igbo Indigenous Knowledge Systems (IIKS), including folklore, rituals, and customs.

Degboro and Olatunji (2022) examine how Nigerian students interact with indigenous languages online. Their findings reveal a proficiency gap, with most students preferring English in digital communication. They identify a lack of access to indigenous language platforms, yet recognize

the internet's untapped potential for language revival. While their study centers on online linguistic representation, the current study adopts a more comprehensive view, exploring how digital tools can preserve both language and other cultural elements of the Igbo community.

Amadi (2023), on the other hand, addresses IIKS from a linguistic angle by analyzing the role of Nigerian English Pidgin in translating and preserving Igbo folksongs. The study identifies a decline in cultural transmission among Igbo youth and proposes Pidgin as a bridge language to improve accessibility. Although Amadi does not focus on digital tools, both studies share the goal of making Igbo heritage more relatable to younger generations. The current study diverges by emphasizing digital platforms such as apps, social media, and digital archives as more scalable and inclusive tools for cultural preservation.

Collectively, these studies affirm that digital technology is a valuable asset in revitalizing endangered indigenous knowledge systems. They also reveal a research gap. While language remains a central concern, broader cultural knowledge remains underexplored in digital contexts. This study addresses that gap by focusing on the revitalization of Igbo indigenous knowledge systems in their entirety through the use of digital technology.

Theoretical Framework

Technological Determinism Theory

Media technological determinism is a theory that proposes the decisive role of media technology in shaping societal structures and cultural values. This idea was primarily introduced by Canadian media scholar Marshall McLuhan in 1964. McLuhan's famous phrase, "the medium is the message," emphasizes that the nature of a medium, rather than its content, significantly influences human consciousness and societal organization. According to this theory, advancements in communication technologies, from the printing press to the internet, are the key drivers of major social and cultural transformations.

The core principle of media technological determinism is that innovations in communication media serve as the primary catalysts for social and cultural evolution. This perspective suggests that each new form of media alters human interactions and societal systems in a predictable manner, leading to a sequential progression in historical development (Postman, 2000). However, the theory has been widely critiqued for over simplifying the relationship between technology and society. Critics argue that it attributes excessive influence to technology while overlooking human agency and the impact of social, economic, and political factors. Furthermore, deterministic approach assumes that technological change is inevitable and beyond human control, disregarding the possibility of human intervention and resistance. This theoretical framework suggests that technology influences societal transformation and cultural shifts. It can be applied to examine how digital technologies contribute to the communication, preservation, and promotion of Igbo indigenous knowledge systems.

Digital Technology as a Tool for Revitalizing the Igbo Indigenous Knowledge System (IIKS)

Digital technology provides a powerful means of revitalizing IIKS, ensuring that it is preserved, documented, and transmitted to future generations in accessible and engaging ways. This is actualised through the following ways:

1. Digital documentation and archiving

Digital documentation refers to the process of converting physical, oral, and traditional knowledge into digital formats for preservation, accessibility, and distribution. This includes text, audio, video, images, and interactive formats of Igbo folktales, proverbs, idioms, and storytelling traditions. Igbo knowledge of herbs, healing practices, and indigenous pharmacology, Igbo rites of passage, masquerade traditions, and religious ceremonies are captured here. Traditional Igbo music and sculptures can be documented and archived through text - based digitalization such as : Scanning and OCR (Optical Character Recognition), E-books and Digital libraries, Crowd sourced documentation, Oral History Recording, Podcasting and Audio Archives, Digital Video Archives, Cloud-Based Archives, Block chain for knowledge protection, Mobile apps for Cultural learning.

Digital documentation and archiving of Igbo indigenous knowledge are essential for cultural preservation, identity reinforcement, and intellectual empowerment. By leveraging modern technologies and with the right digital strategy, Igbo knowledge can thrive in the modern era, bridging the past and future generations.

2. **Social media and online communities**

Social media and online communities have emerged as powerful tools for the documentation, dissemination, and revitalisation of Igbo indigenous knowledge systems. Platforms such as: Facebook and Instagram Pages for Igbo folktales, YouTube channels for Igbo oral traditions, TikTok and Instagram Reels for short storytelling, WhatsApp and Telegram for Igbo language learning groups, Duolingo and Mobile app communities and so on provide interactive spaces for the promotion and exchange of Igbo indigenous knowledge. These platforms serve as virtual archives, discussion forums, and learning hubs, where Igbo cultural elements are shared, debated, and sustained.

3. E-Learning platforms and mobile apps

a. Online courses and tutorials

Structured online courses provide comprehensive Igbo language education, covering everything from basic grammar to advanced conversation skills. Platforms like Coursera, Udemy, and edX can host specialized Igbo language courses featuring video lectures, reading materials, interactive exercises, and progress assessments. Additionally, YouTube tutorials can serve as valuable supplements, offering extra practice and detailed explanations on specific topics.

b. Virtual classrooms and Webinars

Live virtual classrooms and webinars create opportunities for real-time interaction with instructors and peers. Platforms such as Zoom, Microsoft Teams, and Google Meet facilitate live

Igbo language classes where learners can practice speaking, ask questions, and receive immediate feedback. Webinars on Igbo culture, including traditions, history, and cuisine, further enrich the learning experience by providing cultural context and fostering interactive discussions.

4. Virtual Reality (VR) and Augmented Reality (AR)

Virtual reality and augmented reality are engaging technologies that aroused environments or present digital information onto the real world. These technologies offer innovative ways to engage with language learning. VR can provide fascinating language learning experiences by keeping users in virtual environments where they can practice speaking and listening in contextual scenarios. AR improves language learning by wrapping translations, pronunciations, and cultural information onto real-world objects through mobile devices or AR glasses. These technologies can make learning the Igbo language more interactive and relevance within the context by:

a. Engaging language learning through virtual reality

Virtual reality (VR) offers immersive environments where learners can practice Igbo in lifelike scenarios. Devices like the Oculus Rift and HTC Vive enable the development of language-learning applications that replicate real-world experiences, such as shopping at a market, dining at a restaurant, or engaging in cultural activities. These interactive settings help learners build confidence and fluency by providing contextual practice while minimizing the anxiety of speaking a new language. Notably, VR allows individuals far from Igbo-speaking regions to experience language immersion without the need for travel. This makes visiting an Igbo community a choice rather than a necessity, particularly considering Nigeria's current security challenges.

b. Cultural simulations and virtual tours

Augmented reality (AR) can overlay digital information onto the physical world, providing interactive language learning opportunities. Apps like Google Lens or ARK it develop features that display Igbo words and phrases when users point their devices at objects. This contextual learning approach helps learners associate words with their real-world counterparts and enhance vocabulary retention. Virtual tours of Igbo cultural sites, such as historical landmarks and traditional villages, can also be created using AR, to provide learners with a deeper understanding of the cultural context in which the language is used.

5. Digital story telling using social media tools

Digital storytelling utilizes multimedia tools to share narratives and preserve cultural heritage. Social media platforms play a crucial role in uniting communities around endangered traditions. Dedicated pages and channels on Facebook, Instagram, and YouTube serve as virtual spaces where speakers of endangered traditions can share stories, exchange cultural knowledge, and engage with others who are passionate about language preservation. These online communities help sustain traditional practices, promote cultural exchange, and create networking opportunities, contributing to the revival of linguistic heritage. Facebook Live, Instagram Reels, WhatsApp and Twitter Spaces enable real-time discussions on Igbo Indigenous Knowledge, fostering direct engagement and knowledge-sharing.

Conclusion

Employing digital technology for Igbo Indigenous knowledge gives considerable opportunities to enhance Igbo Indigenous knowledge preservation and promotion. . Successful initiatives, such as learning apps, online courses, and digital preservation projects turn up as the guiding light for indigenous knowledge preservation. They are instrumental in the revitalization and propagation of these traditions. Through the lens of digital technologies, we can witness the creation of digital archives, mobile applications, and online resources that facilitate the documentation, learning, and dissemination of indigenous knowledge. These technologies break barriers and provide accessible and interactive avenues for individuals, whether they belong to indigenous communities or not. A significant novelty arising from our study is the realization that digital media technology goes beyond a means of preservation but a powerful catalyst for knowledge revitalization.

Recommendations

We encourage researchers, government bodies and students to engage in more robust research on how best to use digital technology tools in promoting Igbo traditional wisdom. Scholars on Igbo Indigenous Knowledge related areas should deem it necessary to make provision for comprehensive and standard documentation that will be accessible for teachers and the learners. The government of the South Eastern Nigeria (Igbo land) should fund the teaching and learning of Igbo language by giving grants to our institutions of learning including those in the remote areas. These grants would assist to carry out researches with adequate equipment. Igbo teachers and content creators should develop fantastic interest in using Igbo language as their medium of communication to an average level.

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