

Integrating Technology and Indigenous Knowledge for Transformational Learning: Implications for Social Science Education Students in the Federal Universities in Nigeria

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ABSTRACT

The integration of technology and indigenous knowledge has the potential to transform education by bridging the gap between traditional wisdom and modern advancements. This study examines how Social Science Education students perceive and engage with the convergence of technology and indigenous knowledge for transformative learning. Using a quantitative approach, the research explores the role of technology in preserving, enhancing, and disseminating indigenous knowledge while fostering critical thinking and innovation. It investigates the challenges and opportunities faced by students in incorporating these elements into their learning experiences. The study also evaluates how such integration can contribute to creating a culturally relevant and technologically advanced education system. Mixed method design was employed. A questionnaire was used to collect the data, while the data were analysed using descriptive statistics. A focused group discussion was also employed for a better understanding of the responses. Findings revealed that a greater number of students are aware of indigenous knowledge. Indigenous knowledge should be integrated into the digital curriculum for sustainability. This research will serve as a guide for educators, policymakers, and curriculum developers in advancing inclusive, relevant education

INTRODUCTION

The role of education in the social, economic and cultural development of any society cannot be overemphasised. In Nigeria, higher education is geared towards producing intelligent graduates equipped with the knowledge and skills needed to address the challenges facing society and its development. These acquired knowledge and skills are situated in African thoughts and ideas and are very helpful in understanding problems in African society for transformational learning. The African thoughts and ideas are indigenous knowledge, which is also the identity of a particular group of people. Without education, there will be no formal or scientific methods of unveiling the value of this knowledge and these skills for social, economic and cultural development. However, the rapid globalisation of knowledge and the rise of digital technology have created a gap between indigenous knowledge systems and modern educational practices. Iroha (2019) states that a lack of incorporation of the Indigenous knowledge systems of local communities could result in the downfall of resource use and erosion of biodiversity. He further stated that indigenous people have their technical knowledge, which is culturally built, that helps them solve their problems. This gap, if left unaddressed, can lead to a gradual loss of indigenous knowledge and cultural identity.

Indigenous knowledge refers to the accumulated wisdom, traditions and practices developed by local communities over generations such as traditional way of planting seeds, irrigation methods, traditional medicine like use of herbal remedies, bone setting, birth practices, traditional conflict resolution and governance like village councils, traditional leadership structures for example *igwe* or *orba*, traditional environmental conservation such as sacred forests which are protected due to their spiritual significance, ensuring biodiversity conservation, traditional seasonal fishing practices among communities along riverine areas, oral traditions like folktales and proverbs to teach morals, history and problem-solving skills, traditional dance and music (Some communities and villages have a unique dance which is part of their identity for celebrations), rituals and community bonding, indigenous skills in making traditional cloth (*Akwatte* for *Abiriba* people), and clay pots that preserve cultural identity and serve economic purposes and all these knowledge is transferred through mentorship. Eze (2013) defined Indigenous knowledge as the knowledge that has been passed on from one generation to another, which helps the community people to survive and face challenges within their environment, and equally manage their animals, plants, rivers, seas and natural environment. The author further stated that Indigenous knowledge is the integration of Indigenous people between political, social, economic, ecological and environmental aspects among groups that have identity through behaviour that can be transmitted from one generation to another. Adeyeye and Mason (2020) opined that indigenous knowledge deals with historical roots. Ezeanya-Esiobu (2019) states emphatically that indigenous knowledge is a communal understanding which depends on the culture of the people living in a community.

In this study, indigenous knowledge is the ideas and wisdom acquired by social science education students from diverse cultures within a country, which can be integrated into formal education to enhance transformational learning for future social, economic and political development. Nnama-Okechukwu and McLaughin (2022) state that Indigenous knowledge should be blended into the Nigerian curriculum for effective instruction in the 21st century. Indigenous knowledge in Nigeria has to do with the culture of different tribes, which is very vital for social and cultural development. It is an important resource for solving problems and sustaining livelihoods, particularly in rural communities. However, these African ideas and wisdom are often undervalued in formal educational settings, especially in social science education. It is also undervalued in food preservation (Vijayan et al., 2022). Due to the rapid global advancement of technology in the education system, it is imperative to integrate Indigenous knowledge and technology during instruction for transformational learning so that the value of Indigenous knowledge will be promoted in society.

Integrating technology in teaching and learning has brought about innovation in academic activities for future development, especially after the COVID-19 pandemic. Abdur-Rahman, Olalekam and Olayiwola (2012) revealed in their study that integrating technology and Indigenous knowledge in learning could promote students' critical thinking and prepare them to face real-world challenges. Adeyeye and Mason (2020) conclude that integrating indigenous knowledge and technology in learning improves technological development in society and the education sector. Gumbo (2023) revealed that integrating technology and indigenous knowledge during teaching and learning is essential for modernising curricula to adopt different types of knowledge systems. Thus, the rate at which technological devices have been incorporated into the education system in this post-COVID-19 pandemic era has been a concern to both students and lecturers due to the innovations that transformed academic activities, which unveil some challenges of technological skills in most Nigerian Universities. These challenges could be limited if indigenous knowledge and technology are incorporated effectively into the education system during teaching and learning. Technologies such as e-learning platforms, mobile applications and artificial intelligence offer unprecedented opportunities to enhance learning experiences and preserve cultural heritage. Ruth (2020) states that technology changes our thinking. By integrating these technologies, lecturers can create innovative pedagogical models that can bridge the gap between indigenous knowledge and contemporary learning methods. Adeeko, Jatto, Esharefesta and Williams (2024) found that the integration of Indigenous knowledge and technology in learning improves the easy dissemination of information on Indigenous activities and practices, which could enhance transformational learning.

Transformational learning emphasises critical thinking, self-reflection, and reshaping of academic activities, which provides a framework for integrating indigenous knowledge with technology in social science education. This approach can foster a deeper understanding of local realities, equip students with culturally relevant skills and enhance their capacity for social change. In Nigeria's Federal Universities, where social science education aims to produce socially

responsible graduates, this integration can significantly enrich the curriculum and promote sustainable development. Barker (2020) defined Transformational learning as a way of changing learners' perspectives of learning. This transformational learning is necessary and has been a concern to educators in this digital age, despite the challenges encountered in incorporating technology and indigenous knowledge in the education sector. Thus, this study seeks to explore how technology and indigenous knowledge can be effectively integrated into social science education in Nigerian Federal Universities. It also aims to identify current practices, assess their impact on transformational learning and provide recommendations for creating a culturally inclusive and technologically advanced educational framework.

LITERATURE REVIEW

Problem Statement/Justification

The integration of indigenous knowledge systems into formal education remains a significant challenge in Nigeria, despite the critical role this knowledge plays in fostering cultural identity, sustainability and community development. Indigenous knowledge, which encompasses unique local practices, traditions and wisdom, has long served as a vital resource for addressing societal challenges such as agriculture, health, governance and environmental conservation. However, this rich heritage is increasingly marginalised in Nigeria's federal universities, particularly in Social Science Education. This neglect has resulted in a widening gap between academic knowledge and the lived realities of local communities. Meanwhile, the rapid advancement of digital technologies has transformed education, offering innovative tools for knowledge preservation, dissemination and application. Despite these advancements, the potential of integrating technology with indigenous knowledge to enhance transformational learning remains underexplored and underutilised in Nigeria's federal universities. Thus, this study seeks to investigate how technology and indigenous knowledge can be effectively integrated into Social Science Education in federal universities, identifying existing gaps, challenges, and opportunities for creating a more inclusive and contextually relevant educational framework.

Objective of the Study

The main aim of this study is to investigate how technology and indigenous knowledge can be effectively integrated into social science education in federal universities for transformational learning. Specifically, the objectives of the study are to investigate the:

- 1) Awareness of Indigenous knowledge among social science education students.
- 2) Role of technology in preserving, disseminating and enhancing indigenous knowledge in social science Education.
- 3) Impact of integrating indigenous knowledge and technology on transformational learning outcomes for students in Social Science Education.
- 4) Strategies and best practices for effectively integrating technology with indigenous knowledge in social science education to promote culturally relevant and innovative learning.

METHODOLOGY

A descriptive survey research design was adopted to gather data from students in the social science education departments of selected federal universities in Nigeria. This design is suitable for investigating the role, impact and strategies related to the integration of technology and indigenous knowledge for transformational learning because it determines the characteristics of the participants. The population consisted of all undergraduate students enrolled in Social Science Education programs in selected universities in Nigeria. A purposive sample was used to select 34 students offering social science Education in selected universities. A structured questionnaire that has three (3) clusters was used for data collection. The questionnaire was validated by experts in Social Science Education and education technology. The reliability was tested using Cronbach's Alpha. The researcher administered the questionnaire digitally (Google Forms) to select students. Clear instructions and consent forms were provided to ensure full understanding and participation. A focus group was conducted. Data was analysed using descriptive statistics with the Statistical Package for the Social Sciences (SPSS), and the focus group discussion was analysed thematically with MAXQDA 2020. Ethical approval was obtained from the relevant institutional review board.

RESULTS

Awareness of Indigenous Knowledge

How familiar are you with indigenous knowledge systems such as traditional farming methods, herbal medicine, and oral storytelling in social science education?

34 responses

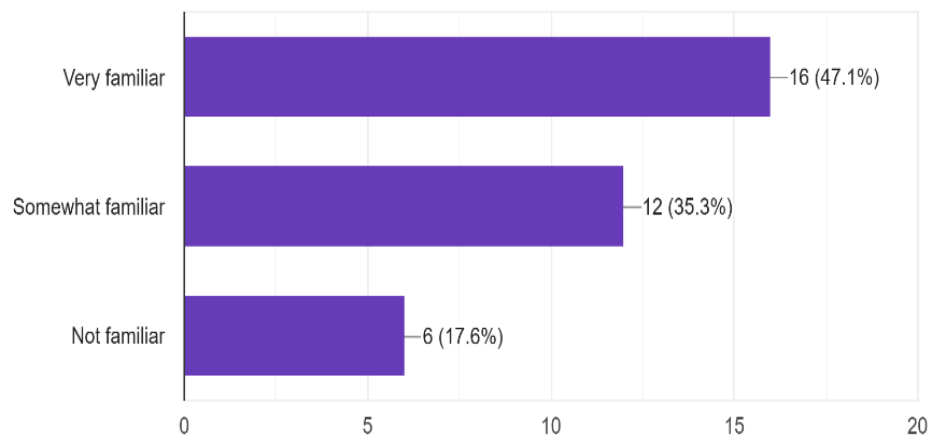


Figure 1

Have you been exposed to Indigenous knowledge in your coursework, such as discussions on Indigenous conflict resolution techniques or environmental conservation practices?

34 responses

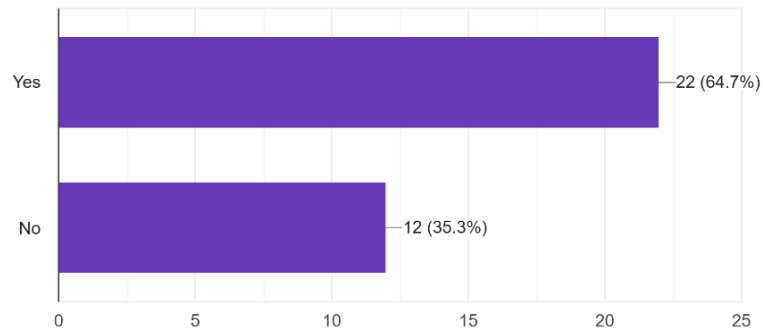


Figure 2

What are the key sources of indigenous knowledge you have encountered? (Select all that apply.)

33 responses

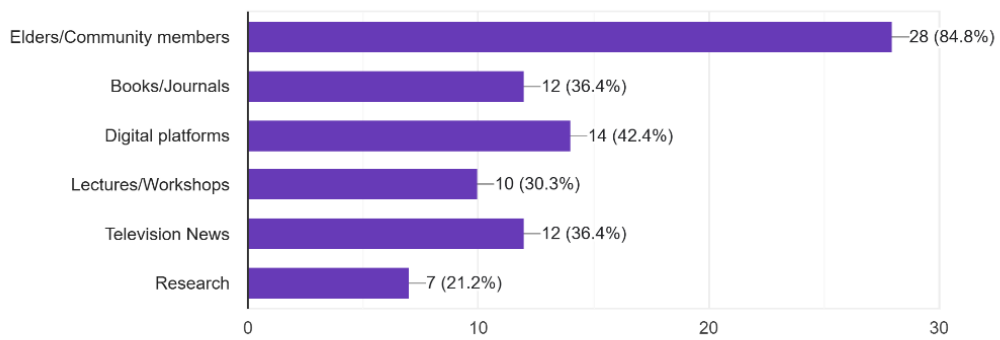


Figure 3

. To what extent do you believe indigenous knowledge, such as communal decision-making and traditional governance systems, is important in social science education?

34 responses

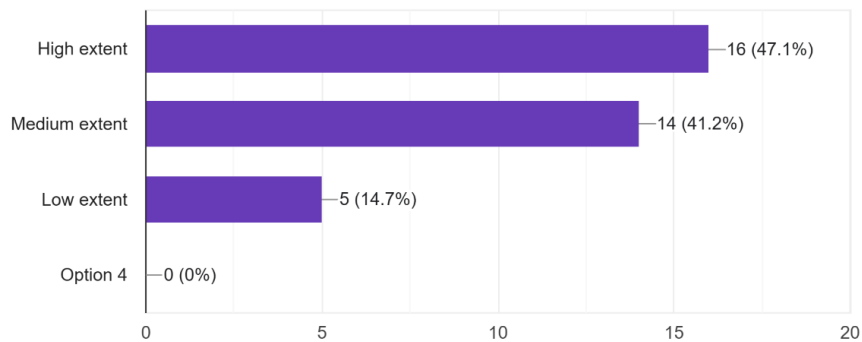


Figure 4

Table 1. Awareness of Indigenous Knowledge Among Social Science

| Document | Coded Segments | Codes | Comments |
|---|--|-------|----------|
| Focus group on indigenous knowledge, Pos. 2 | Marriage Rite | BLUE | Joy |
| Focus group indigenous knowledge, Pos. 5 | We maintain our Nsala traditional food | BLUE | Chibuzo |
| Focus group on indigenous knowledge, Pos. 6 | We respect our deity | BLUE | Ngozi |
| Focus group on indigenous knowledge, Pos. 7 | We have Eze as our traditional leadership. | BLUE | John |
| Focus group indigenous knowledge, Pos. 8 | Folktales are no longer in existence. | BLUE | Ebere |

The results from the questionnaire and focus group on the awareness of indigenous knowledge revealed that students are very familiar with indigenous knowledge systems such as indigenous farming methods, traditional medicine, deity, marriage rites, traditional food, traditional leadership, folktales and were exposed in coursework too, with 47.1 and 64.7 per cent. Also, the key sources of indigenous knowledge are elders/community members.

Role of Technology in Indigenous Knowledge

Do you think technology can help in preserving indigenous knowledge, such as traditional music, folktales, and indigenous ecological knowledge?

34 responses

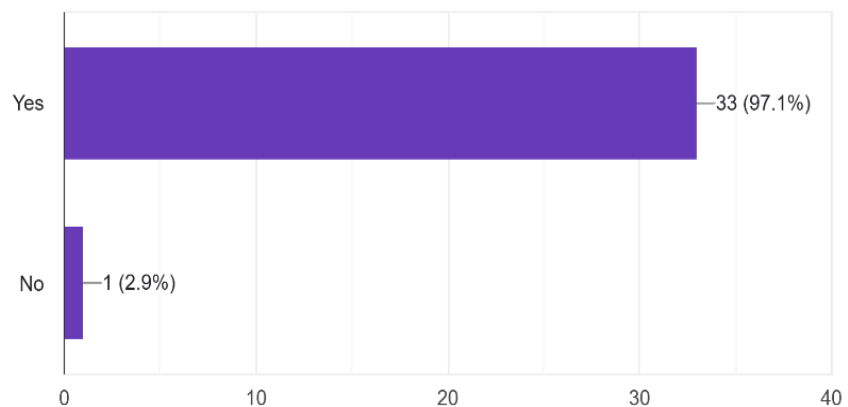


Figure 5

Which technological tools do you think are most effective in disseminating indigenous knowledge, such as proverbs and indigenous ethics? (Select all that apply.)

34 responses

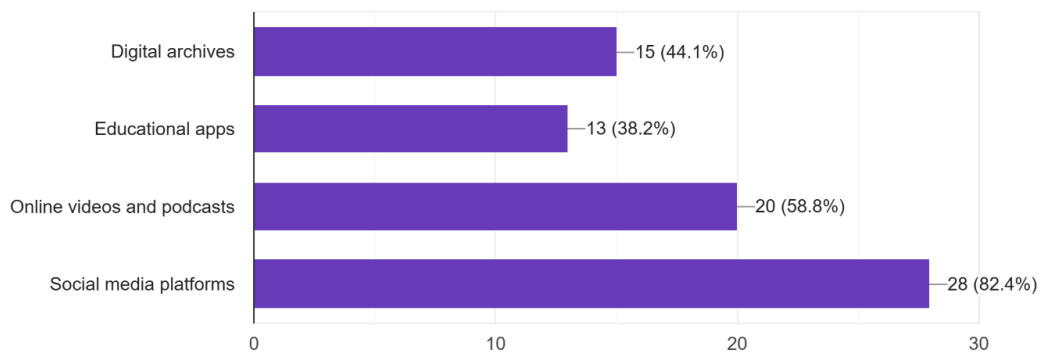


Figure 6

How often do you use technology to access indigenous knowledge, such as learning about indigenous farming techniques through videos or reading digital articles on local traditions?

34 responses

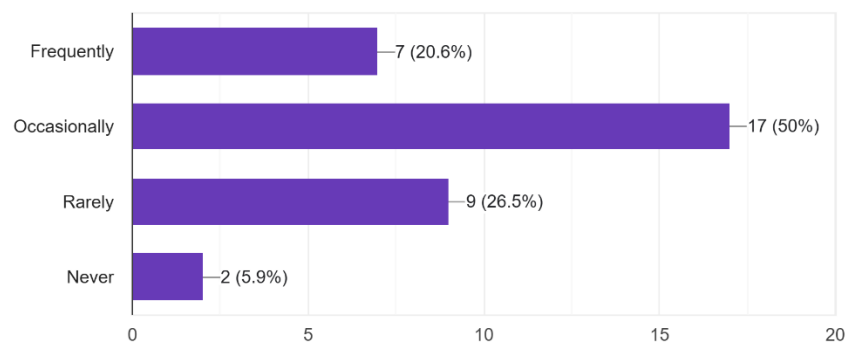


Figure 7

Table 2. Technology for Disseminating and Preserving Indigenous Knowledge

| Document | Coded Segments | Codes | Comments |
|---|---|--------|-----------|
| Focus group Indigenous knowledge, Pos. 10 | YouTube teaches how to cook traditional food | YELLOW | Deborah |
| Focus group Indigenous knowledge, Pos. 12 | Facebook | YELLOW | Moderator |
| Focus group Indigenous knowledge, Pos. 13 | digital museum where culture and traditional activities are displayed | YELLOW | Adaobi |

| | | | |
|---|---|--------|--------|
| Focus group Indigenous knowledge, Pos. 15 | There is a documented Igbo history online through the video editing app | YELLOW | Agatha |
| Focus group Indigenous knowledge, Pos. 16 | People learn through the internet | YELLOW | Paul |

The results above revealed that 97.1% of the students agreed that technology helps in preserving Indigenous knowledge, and 82.4% are on the side that social media platforms are the technological tool that is most effective in disseminating Indigenous knowledge. 50% of the students occasionally use technology to access Indigenous knowledge, while 26.5% rarely do so. The results from the focus group revealed that YouTube, Facebook, digital museums, video editing apps and the internet were used to disseminate and preserve indigenous knowledge.

Impact of Integrating Indigenous Knowledge and Technology

To what extent has the integration of technology and Indigenous knowledge, such as using WhatsApp to explore traditional festivals and culture, enhanced your learning experience?
 34 responses

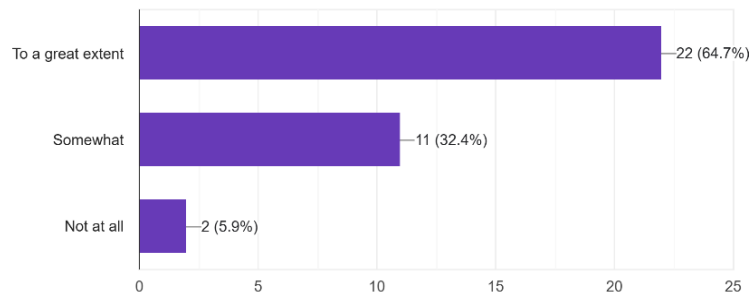


Figure 8

Do you believe integrating Indigenous knowledge with technology, such as digital storytelling or online courses on Indigenous heritage, promotes learning and engagement in social science education?
 34 responses

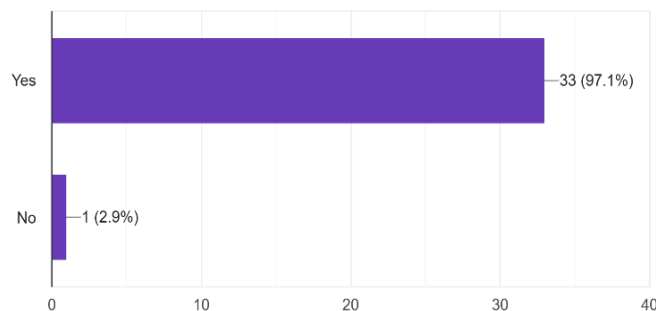


Figure 9

What challenges do you face in accessing indigenous knowledge through technology? (Select all that apply.)

34 responses

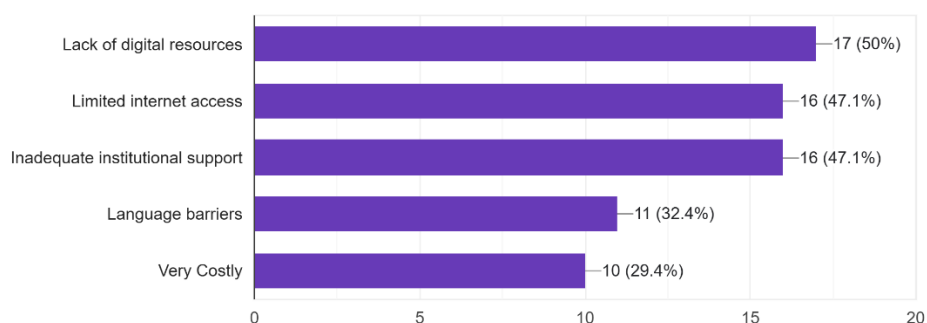


Figure 10

Table 3. The Impact of Integrating Indigenous Knowledge with Technology

| Document | Coded Segments | Codes | Comments |
|--|---|-------|----------|
| Focus group Indigenous knowledge, Pos. 18 | People living outside their country learn their indigenous language online. | RED | Ngozi |
| Focus group Indigenous knowledge, Pos. 19 | On the negative side of it, people in my village who live outside feel reluctant to come home for our native festival because they will view it online. | RED | Joy |
| Focus group Indigenous knowledge, Pos. 21 | Sometimes they will not display exactly how the culture is, and this reduces the value of the culture. | RED | Calister |
| Focus group Indigenous knowledge, Pos. 23 | Technology helps us to have an idea of other people's cultures. | RED | Joy |
| Focus group Indigenous knowledge, Pos. 25 | We have a loss of identity because people fake ideas. | RED | Chizoba |
| Focus group Indigenous knowledge, Pos. 26 | Some folktales are online like radio and television, and it will deprive some people of going home and listening to the elders. | RED | Agatha |

From the results above, 64.7% to a great extent agreed that the integration of technology and indigenous knowledge enhanced learning experiences. 97.1% believed that integrating indigenous knowledge with technology promotes deeper understanding and engagement in social science education. The most common challenges are lack of digital resources 50%, limited internet access 47.1% and lack of institutional support 47.1%. The impact of the focus group discussions is that some people feel reluctant to come home, online display reduces the value of culture, technology helps to have an idea of other people's culture, and some folktales are online.

Strategies and Best Practices for Effective Integration of Indigenous Knowledge and Technology

Cluster D: Strategies and Best Practices for Effective Integration of Indigenous Knowledge and Technology.

34 responses

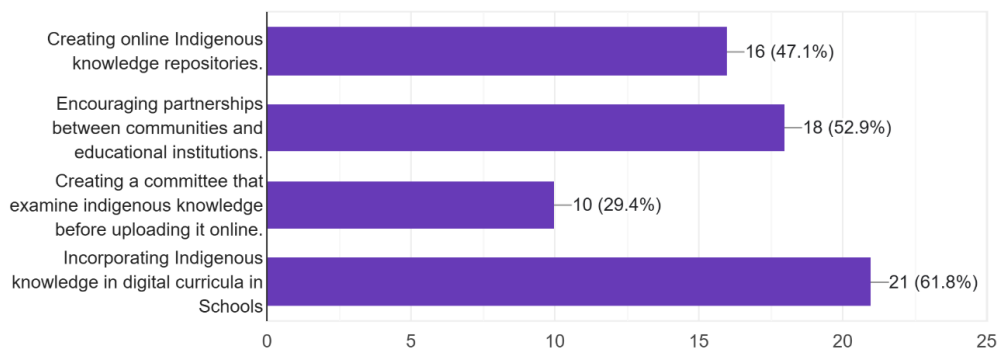


Figure 11

Table 4. The Strategies for Effective Integration of Technology with Ind

| Document | Coded Segments | Codes | Comments |
|---|--|-------|------------|
| Focus group Indigenous knowledge, Pos. 29 | Proper research. | GREEN | Joy |
| Focus group Indigenous knowledge, Pos. 30 | Parents should teach their children the Indigenous knowledge | GREEN | Chidiebere |
| Focus group Indigenous knowledge, Pos. 31 | Community involvement is very important | GREEN | Ebere |

| | | | |
|--|---|-------|----------|
| Focus group Indigenous knowledge, Pos. 33 | The government should update the curriculum with the teaching of indigenous knowledge. | GREEN | Ngozi |
| Focus group Indigenous knowledge, Pos. 35 | Parents should form the habit of taking their children home to enable them to participate in cultural activities at home. | GREEN | Calister |
| Focus group Indigenous knowledge, Pos. 36 | The three Nigerian languages should be taught in the school | GREEN | Calister |
| Focus group Indigenous knowledge, Pos. 36 | Parents should teach their children how to cook traditional food at home. | GREEN | Ebere |

The results above revealed that the best strategies for effective integration of technology with Indigenous knowledge are incorporating Indigenous knowledge in digital curricula in schools, 61.8%, and encouraging partnerships between communities and educational institutions, 52.9% while others are at low percentages. Focus group discussions revealed that proper research and community involvement, the government should update the curriculum, and parents should teach their children indigenous knowledge.

DISCUSSION

The study revealed that a higher percentage of students are aware of Indigenous knowledge and equally exposed to some of the Indigenous knowledge in social science Education. This finding is in contrast with the findings of Einosho (2013), who revealed that science students are not aware of indigenous activities in cassava processing, and indigenous science is involved in the processing of cassava. Nnama-Okechukwu and McLaughlin (2022) disagreed on the findings of this study that students are not aware of indigenous knowledge in social work education rather more of Western knowledge. Moreover, the study revealed that elders/community leaders are the key sources of indigenous knowledge in the society.

Furthermore, the study revealed that technology helps in preserving indigenous knowledge, and social media has the highest percentage in disseminating indigenous knowledge among social science education students. This finding agrees with the findings of Eze and Ike (2013), who revealed that the integration of indigenous knowledge in the education system could improve sustainable development. But, in contrast with that of Ogbon (2019), who found that despite the technological advancement in Nigeria, the effect of the intersection of indigenous knowledge in small-scale industries and agricultural

practices is insignificant. Also, Social science students agreed that the impact of integrating technology and indigenous knowledge is to a great extent. Adeyeye and Mason (2020) supported the findings of this study and stated that indigenous knowledge has a positive impact on technological development. The best strategy revealed in this study is the indigenous knowledge in digital curricula in schools.

CONCLUSIONS AND RECOMMENDATIONS

Technology enhances the growth of any country that knows its importance in society. Indigenous knowledge is embedded in the culture, which is people's way of life and identity. Integrating indigenous knowledge and technology for transformational learning promotes learning irrespective of the environment and helps to preserve the culture of any ethnic group for sustainable development, but its originality should not be violated.

FURTHER STUDY

This research still has limitations, so it is necessary to conduct further research related to the topic on Integrating Technology and Indigenous Knowledge for Transformational Learning, which can cover other federal universities in Nigeria. Since this research focused on the federal Universities in Southeast, further research in other federal Universities in geopolitical zones will help to perfect this research and increase insight for readers.

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