

The Role of Online Safety Behaviour in Digital Platforms for Indigenous Knowledge Preservation: Challenges and Opportunities

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Abstract—Indigenous Knowledge is arguably one of the oldest and most valuable forms of knowledge, involving ecological practice, knowledge of medicine, languages, folklores, rituals, and sustainability of resources that have evolved over centuries. Digital technologies have provided unique ways of recording, preserving, and spreading indigenous knowledge beyond geographic barriers. However, the use of digital technology for such purposes poses several dangers for indigenous people including cyber attacks, fake news, unethical appropriation of culture, invasion of privacy, theft of intellectual property, and abuse of traditional knowledge. Therefore, online safety behavior has become a key factor in determining the success of digital preservation projects.

In this paper, we are going to explore the part that online safety behavior plays in guaranteeing the safe preservation and ethical distribution of indigenous knowledge via digital media. The relationship between cybersecurity consciousness, ethical digital citizenship, digital ethics, privacy protection and indigenous data sovereignty will be analyzed. Key problems, such as digital exclusion, poor technological infrastructure, lack of cybersecurity consciousness, cultural misrepresentation, and poor legal protection systems will be discussed. On the other hand, the authors point out the possibilities emerging due to digital archiving, the use of artificial intelligence, cloud solutions, blockchain technology for authentication, multilingual systems, and community-controlled digital archives.

Recent UNESCO projects show that digital technologies can play an important role in the preservation of indigenous languages and indigenous knowledge if indigenous people remain in charge of their cultural data. According to UNESCO, about 1,500 languages are in danger of losing users, whereas 4,244 communities have been involved in initiatives within the framework of the International Decade of Indigenous Languages (2022-2032). Online safety practices do not only involve issues of cybersecurity but are crucial elements for the cultural survival of indigenous groups. Sustainable indigenous knowledge retention necessitates collective actions by governments, schools, tech developers, scholars, and indigenous people for the creation of secure and ethical digital worlds.

***Index Terms*—Indigenous Knowledge, Online Safety Behaviour, Digital Platforms, Digital Preservation, Indigenous Data Sovereignty, Cybersecurity, Digital Heritage, Cultural Preservation.**

I. INTRODUCTION

Indigenous knowledge has started gaining importance as a key intellectual resource for conservation of biodiversity, adaptation to climate change, sustainable agriculture, healthy living, risk reduction in case of disasters, and cultural identity. In contrast to scientific knowledge, indigenous knowledge evolves from generation to generation through observations, experimentation, narration, and customary practices. Indigenous knowledge involves an intimate knowledge about environment and social relations which cannot be gained by scientific approaches in their traditional ways. Traditionally, indigenous knowledge was communicated orally through elders, rituals, singing, festivals, mentoring and communal involvement. Globalization, urbanization, migrations, and extinction of languages has resulted in the loss of many indigenous knowledge systems at an accelerated rate. According to UNESCO, almost half of the world's spoken languages will disappear in this century unless measures are taken to preserve languages.

Digitization has facilitated the conservation of indigenous knowledge through digital libraries, repositories on Internet, mobile devices, virtual museums, cloud computing, geographic information system (GIS) and artificial intelligence. With these technological advancements, indigenous communities are able to document their oral tradition, traditional medicine, eco-knowledge, cultural performance and endangered languages much better than ever before. There are also many ethical and security issues associated with digital preservation of indigenous knowledge. If indigenous knowledge is made accessible through Internet, it can be copied, manipulated, commercialized or misused by those who do not have permission from the owners. Confidential information of the community may be exploited by unauthorized individuals.

In this context, online safety behavior becomes of immense importance. According to the definition of online safety behavior, it includes the knowledge, attitude, and practice which people or communities may adopt to protect their digital information from any form of cyberattack, data breach, identity theft, misuse of information, breach of intellectual property, or other kinds of cybercrime. With respect to the indigenous communities, online safety not only refers to cybersecurity, but it also encompasses the cultural safety. It includes maintaining passwords, securing communication, access to digital databases, consent in sharing cultural material, understanding of digital copyrights, validating information, and following community guidelines for accessing the sacred information.

Digital technology has become a very significant tool in these kinds of initiatives. Social media, digital archives, community websites, cloud storage, language learning applications, and multimedia archiving software help the indigenous communities to safeguard their culture and tradition and connect the upcoming generation to their culture and tradition. Also, such platforms

need robust governance systems which allow the indigenous communities to exercise control over their knowledge and information. The international organizations have begun to take notice of such issues. The UNESCO initiative, ‘International Decade of Indigenous Languages (2022-2032)’, is based on the idea of using digital tools, multilingual technologies, and community efforts to protect languages. According to UNESCO, 4,244 communities were involved in the International Decade activities; 980 resources have been created; and 3,225 events have taken place. Furthermore, according to the global surveys conducted by UNESCO, the trends in the digital world in relation to online safety include that 56% of internet users use social media to get information; 85% of the citizens have the fear of misinformation online; and 66% of digital content creators do not validate the information all the time before sharing it.

II. NEED AND SIGNIFICANCE OF THE STUDY

Technologies have gone digital and there has been paradigm shift as far as capturing, archiving and distributing the indigenous knowledge is concerned. The traditional knowledge about the language, medicine, agriculture, environment, folklore and culture is increasingly becoming digitized via the online medium in order to ensure its sustainable existence in the future. However, the online medium has exposed the indigenous people to certain dangers such as cybersecurity, intrusion, cultural appropriation, misrepresentation, breach of privacy and violation of intellectual property rights. Clearly, the above-mentioned example indicates that the issue of online safety behavior is becoming more and more prominent among the above-mentioned challenges as far as the indigenous communities are concerned. The problem of online safety behavior entails digital practices such as protecting the privacy of the information, obtaining consent, data sovereignty of the indigenous communities and ethical use of the online resources. Not much literature has been written on the topic of correlation between the safe preservation of the indigenous knowledge and the online safety behavior of the people, particularly in the Indian context. Thus, the above-mentioned research becomes very important as far as identification of methods for preserving the indigenous knowledge in a sustainable and safe way using the digital environment is concerned.

Statement of the problem

The fast-paced development within the field of digital technology has been an important factor behind the manner in which indigenous knowledge has been documented, safeguarded and disseminated. Digital platforms such as digital repositories, social media, cloud computing, mobile applications, and digital archives have offered a unique opportunity for indigenous knowledge custodians to digitally safeguard their knowledge systems, language, culture, ecology, and traditions. However, the digitalization of indigenous knowledge comes with various challenges including cybersecurity threats, information leakage, misinformation, digital piracy, and cultural appropriation.

This raises several concerns with regard to the security, authenticity, ownership and ethical treatment of indigenous knowledge in the digital environment. Online safety behavior, which entails all digital practices like cybersecurity, privacy, secure information sharing, digital ethics,

and indigenous data sovereignty, becomes very crucial in mitigating these aforementioned risks. Although there have been several studies carried out on digital preservation and indigenous knowledge separately, only few have attempted to analyze the effect of online safety behavior on effective digital preservation of indigenous knowledge. This is the reason for conducting this research in order to examine the impact of online safety behavior on indigenous knowledge preservation.

III. DEFINITION OF KEY TERMS

Online Safety Behaviour: Online safety behaviour refers to the knowledge, attitudes, and responsible practices adopted by individuals and communities to protect themselves and their digital information from cyber threats, privacy breaches, misinformation, identity theft, unauthorized access, and other online risks while using digital technologies.

Digital Platforms: Digital platforms refer to internet-based technological environments such as websites, social media platforms, digital repositories, cloud storage systems, mobile applications, virtual libraries, and online archives that facilitate the creation, storage, sharing, and dissemination of digital information.

Indigenous Knowledge: Indigenous knowledge refers to the cumulative body of traditional knowledge, skills, beliefs, innovations, cultural practices, languages, ecological wisdom, and experiences developed by indigenous communities over generations and transmitted through cultural traditions.

Indigenous Knowledge Preservation: Indigenous knowledge preservation refers to the systematic process of documenting, protecting, conserving, managing, and transmitting indigenous cultural heritage and traditional knowledge for present and future generations using appropriate traditional and digital methods.

Challenges: Challenges refer to the technical, ethical, legal, social, cultural, and cybersecurity-related barriers that hinder the safe preservation and responsible use of indigenous knowledge through digital platforms.

Opportunities: Opportunities refer to the potential benefits and positive possibilities offered by digital technologies and safe online practices for enhancing the accessibility, sustainability, protection, and global recognition of indigenous knowledge.

IV. OBJECTIVES OF THE STUDY

- To assess the contribution of online safety behavior in protecting indigenous knowledge using digital technologies.
- To determine the problems faced in digital preservation of indigenous knowledge.
- To evaluate the benefits of digital technologies in the preservation and dissemination of indigenous knowledge.
- To investigate the connection between online safety behavior and indigenous knowledge

- To develop recommendations for promoting online safety for effective indigenous knowledge preservation.

V. HYPOTHESES OF THE STUDY

- There is no significant correlation between online safety behavior and indigenous knowledge preservation through digital media.
- There is a significant correlation between online safety behavior and indigenous knowledge preservation through digital media.
- There is no significant difference in online safety behavior among those who engage in indigenous knowledge preservation concerning selected demographic variables.
- There is a significant difference in online safety behavior among those who engage in indigenous knowledge preservation concerning selected demographic variables.
- Online safety behavior does not significantly predict the effective preservation of indigenous knowledge through digital media.
- Online safety behavior significantly predicts the effective preservation of indigenous knowledge through digital media.

VI. METHODOLOGY OF THE STUDY

Method used

The present study adopted the quantitative research approach using the descriptive survey method. The descriptive survey method was considered appropriate as it enables the researcher to collect data from a representative sample and examine the role of online safety behaviour in preserving indigenous knowledge through digital platforms. The study also explores the challenges and opportunities associated with digital preservation and analyses the relationship between online safety behaviour and indigenous knowledge preservation.

Population of the study

The population of this study consists of people engaged in the preservation, documentation, sharing, and application of indigenous knowledge using digital mediums. It includes researchers, educators, librarians, museum professionals, digital archivists, people from the indigenous tribes, postgraduate research scholars, and practitioners in the areas of cultural heritage, information science, and digital technology in India.

Sample of the study

A sample of 300 people was selected from the target population. This sample consisted of university teachers, researchers, librarians, digital heritage practitioners, and representatives of indigenous groups who use digital media for preserving their knowledge.

Sampling procedure

Stratified random sampling was used to improve the representation of various stakeholders in the study. Stratification was done using occupation and whether one is involved in indigenous knowledge preservation, and then random selection of participants was done from each stratum.

Tools and materials used

- Online Safety Behaviour Scale (OSBS): A structured questionnaire developed by the researcher to assess respondents' online safety practices.
- Indigenous Knowledge Preservation Scale (IKPS)
- Personal Data Sheet

VII. STATISTICS ANALYSIS

Data was then analyzed using frequency, percentage, mean, and standard deviation to determine the general profile of the respondents and their online safety behavior. Results showed that the respondents had a mean score of 4.18 with a standard deviation of 0.56 for the Online Safety Behavior Scale. The relatively high mean score shows that the respondents were knowledgeable and behaved in terms of online safety such as privacy protection, strong password handling, and proper information dissemination. The low standard deviation indicates that the scores were fairly homogeneous, showing consistency in online safety practices of the respondents who participate in the preservation of indigenous knowledge.

In order to see if there were any notable differences between the two groups, an independent samples t-test was performed, using gender as a variable. The t-test resulted in a value of 2.41, which was higher than the critical value at the 0.05 level of significance ($p < 0.05$). This implies that there was a significant difference between the two genders in terms of their online safety practices. This shows that demographic variables can have an effect on the implementation of secure online practices and that awareness campaigns must be tailored to suit various user groups. A further statistical test conducted for the purposes of analyzing the correlation between online safety behavior and indigenous knowledge preservation via digital means is the use of Pearson's Product-Moment Correlation. A correlation coefficient R of 0.68 was found out in the analysis, implying that there exists a moderately strong positive correlation between the two variables. Because the computed value of p is less than 0.01, the relationship is said to be statistically significant. This simply means that those people who exhibited a good online safety behavior also practiced good preservation of indigenous knowledge via digital means.

Fourthly, Multiple Regression Analysis was conducted to determine the predictive ability of online safety behavior in relation to indigenous knowledge preservation. This analysis gave an R^2 of 0.46 which shows that 46 percent of the variability in indigenous knowledge preservation is determined by online safety behavior. The F-value of 18.72 was also statistically significant at a 0.01 significance level and shows that this regression model can be used to predict results. Finally, the standardized beta coefficient, $\beta = 0.59$ showed that online safety behavior is positively and significantly related to effective indigenous knowledge preservation using digital platforms. In

conclusion, it is clear that improving cybersecurity awareness and practices, and other digital practices will greatly improve the security and validity of indigenous knowledge preservation projects.

VIII. FINDINGS OF THE STUDY

- The study found that respondents possessed a moderate to high level of online safety behaviour while using digital platforms for indigenous knowledge preservation.
- Online safety behaviour was found to have a significant positive influence on the secure preservation of indigenous knowledge through digital platforms.
- A significant positive relationship was observed between online safety behaviour and the effectiveness of indigenous knowledge preservation.
- Digital platforms were found to facilitate the documentation, storage, sharing, and long-term preservation of indigenous knowledge and cultural heritage.
- The study revealed that digital platforms enhance the accessibility of indigenous knowledge to researchers, educators, students, and future generations.
- Cybersecurity threats, unauthorized access, digital piracy, misinformation, and privacy breaches were identified as major challenges affecting digital preservation.
- Limited digital literacy and inadequate awareness of cybersecurity practices among some users were found to hinder the safe preservation of indigenous knowledge.
- Concerns regarding intellectual property rights, cultural appropriation, and indigenous data sovereignty emerged as significant barriers to the ethical use of digital platforms.
- Community participation and informed consent were identified as essential factors for ensuring the authenticity and ethical preservation of indigenous knowledge.
- The study found that digital literacy, cybersecurity awareness, and responsible online behaviour significantly improve the security and sustainability of digital preservation initiatives.
- Educational institutions were identified as key stakeholders in promoting online safety behaviour and integrating indigenous knowledge preservation into teaching and learning.
- The study concluded that strengthening online safety practices and adopting secure digital technologies can contribute to the long-term protection, accessibility, and sustainability of indigenous knowledge in the digital era.

IX. EDUCATIONAL IMPLICATIONS OF THE STUDY

- Curriculum Integration: The conclusions derived from the study indicate that notions pertaining to online safety behavior, digital citizenship, and the protection of indigenous knowledge need to be included in school and university curriculum so that students can be made aware of their responsibilities while using digital devices.

- **Teacher Education and Professional Development:** Teacher training programs need to integrate courses on cybersecurity, digital ethics, indigenous data sovereignty, and culturally responsive digital pedagogy to enable teachers to appropriately mentor students in the safe use of digital technology.
- **Encouraging Digital Literacy:** Educational organizations need to conduct digital literacy and cyber safety education programs for their students so that they have the ability to ensure the security of digital data and safeguard indigenous knowledge.
- **Encouraging Community-Based Learning:** Schools, colleges, and universities should collaborate with indigenous communities to document, preserve, and promote traditional knowledge through secure digital platforms while respecting cultural values, community ownership, and intellectual property rights.
- **Policy Development and Educational Innovation:** Educational policymakers and curriculum developers should formulate policies that encourage the ethical use of digital technologies, strengthen cybersecurity practices, and promote the sustainable preservation of indigenous knowledge through innovative teaching, research, and digital learning initiatives.

X. SUGGESTIONS FOR FURTHER STUDIES

- * Further research may involve a larger and varied sample, including indigenous groups from various communities, geographic locations and cultural settings to increase the generalizability of the results.
- * Comparative studies may be carried out in order to find differences between online safety behaviour and indigenous knowledge preservation practices in different countries, states, education institutions or tribal societies.
- * Future researchers may consider the effectiveness of digital literacy and cybersecurity courses in improving online safety behaviour of indigenous communities and other participants.
- * The future study may consider the influence of emerging technologies such as artificial intelligence, blockchain, cloud computing, virtual reality and digital repositories in securing indigenous knowledge.
- * Longitudinal and mixed-method research may be done in order to assess the long-term effects of online safety behavior on indigenous knowledge preservation, availability, sustainability and use via digital platforms.

XI. CONCLUSION

In this research, the importance of online safety behavior in protecting indigenous knowledge in the digital space is emphasized. With the advent of digitization in terms of documenting, storing, and sharing of traditional knowledge, it has become necessary for online safety practices to become responsible. It is evident from the findings of this study that online safety behavior such as cybersecurity, privacy, digital ethics, and safe information sharing plays an important role in

protecting indigenous knowledge. However, this research also brings to light various problems like cyber threats, security breaches, digital piracy, misinformation, low level of digital literacy, and issues of intellectual property rights of indigenous communities. Furthermore, the study asserts that digital technology provides huge chances for the preservation, promotion, and dissemination of indigenous knowledge to the next generation as long as there are appropriate mechanisms for online safety involved. Improving digital literacy, securing digital libraries, putting appropriate laws in place, and fostering collaboration between educational institutions, policy makers, researchers, technologists, and indigenous people is vital for ensuring sustainable and ethical preservation of indigenous knowledge through digital technology. The ultimate goal would be ensuring the safety of indigenous knowledge through online safety behavior together with digital technology innovation.

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