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Strategies For Endangered Language Preservation Throughg Blockchain And Tecnology In SD Negeri 064023 Kemenangan Tani, Academic Year 2025/2026

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ABSTRACT

This study aimed to explore strategies for preserving endangered local languages through the integration of blockchain and digital technology in elementary school. The research was conducted at SD Negeri 064023 Kemenangan Tani academic year 2025/2026. The study focused on how technology-based learning could be designed to strengthen students' awareness and participation in protecting linguistic heritage. A qualitative descriptive approach was employed, involving classroom observations, teacher interviews, and documentation analysis. The findings indicated that blockchain technology provided a secure digital framework for recording, storing, and sharing local language materials, ensuring authenticity and preventing data loss. Digital storytelling and multimedia platforms enhanced students' engagement and speaking confidence while learning local linguistic elements. The implementation of this digital preservation model encouraged collaboration between teachers, students, and the local community. It also fostered a sense of cultural identity and pride among young learners. The study concluded that integrating blockchain and digital media in the elementary classroom represented an innovative and sustainable approach to language preservation in the global digital era. These strategies not only supported pedagogical goals but also contributed to cultural resilience and digital literacy at the primary school level.

Keyword: Language_Preservation, Blockchain, Technology

ABSTRAK

Studi ini bertujuan untuk mengeksplorasi strategi pelestarian bahasa daerah yang terancam punah melalui integrasi blockchain dan teknologi digital di sekolah dasar. Penelitian ini dilakukan di SD Negeri 064023 Kemenangan Tani tahun ajaran 2025/2026. Studi ini berfokus pada bagaimana pembelajaran berbasis teknologi dapat dirancang untuk memperkuat kesadaran dan partisipasi siswa dalam melindungi warisan linguistik. Pendekatan deskriptif kualitatif digunakan, yang melibatkan observasi kelas, wawancara guru, dan analisis dokumentasi. Temuan menunjukkan bahwa teknologi blockchain menyediakan kerangka kerja digital yang aman untuk merekam, menyimpan, dan berbagi materi bahasa dajerah, memastikan keaslian dan mencegah kehilangan data. Penceritaan digital dan platform multimedia meningkatkan keterlibatan dan kepercayaan diri siswa dalam berbicara saat mempelajari unsur-unsur linguistik lokal. Implementasi model pelestarian digital ini mendorong kolaborasi antara guru, siswa, dan masyarakat setempat. Hal ini juga menumbuhkan rasa identitas budaya dan kebanggaan di kalangan pelajar muda. Studi ini menyimpulkan bahwa integrasi blockchain dan media digital di kelas sekolah dasar merupakan pendekatan inovatif dan berkelanjutan untuk pelestarian bahasa di era digital global. Strategi ini tidak hanya mendukung tujuan pedagogis tetapi juga berkontribusi pada ketahanan budaya dan literasi digital di tingkat sekolah dasar.

Kata kunci: Pelestarian_Bahasa, Blockchain, Teknologi

I. PENDAHULUAN / INTRODUCTION

1. Latar Belakang

Language plays an essential role in shaping cultural identity, communication, and social interaction. However, in the global digital era, many local and regional languages face the threat of extinction due to modernization, globalization, and limited intergenerational transmission. The rapid spread of dominant languages such as English and Indonesian has gradually displaced indigenous languages, causing younger generations to lose their linguistic and cultural roots. This phenomenon has raised serious concerns among educators, linguists, and policymakers about how education—especially at the elementary level—can become a foundation for language preservation (Aditya Dharma, 2019; R. N. K. Rambe, 2018).In the context of elementary education, schools serve as the first formal institution where cultural and linguistic values can be systematically introduced. Teachers, therefore, play a crucial role in integrating local language learning into classroom activities using innovative teaching approaches. The integration of technology into education has opened new possibilities for language preservation. Emerging technologies, such as blockchain and digital learning media, offer secure, decentralized, and transparent systems that can store and share language data sustainably (Aditya Dharma, 2019). Blockchain technology ensures that digital records of endangered languages are authentic, traceable, and resistant to loss or manipulation, while digital storytelling and multimedia platforms make the learning process more interactive and engaging for young learners (R. N. K. Rambe, 2018).Theoretically, this study is grounded in the principles of constructivist learning, where students actively construct knowledge through meaningful digital experiences, and the theory of digital literacy, which emphasizes the ability to access, understand, and create information using technology. Both frameworks support the development of a technology-based learning environment that not only enhances language learning outcomes but also strengthens students' cultural awareness (Aditya Dharma, 2019).The main problem addressed in this study was the lack of effective strategies for preserving endangered local languages within the elementary education system. Many schools still rely on traditional methods that do not incorporate digital preservation tools or promote cultural engagement among students. To solve this problem, the study proposed an innovative approach that integrates blockchain and digital technology into the teaching and learning process at SD Negeri 064023 Kemenangan Tani (R. N. K. Rambe, 2018).The purpose of this research was to design, implement, and evaluate technology-based strategies that could preserve endangered languages while simultaneously improving students' digital competencies and cultural appreciation. Through these strategies, it was expected that the elementary classroom would become a dynamic environment for sustaining linguistic diversity and fostering national identity in the global digital era (Aditya Dharma, 2019; R. N. K. Rambe, 2018.

2. Problem Formulation

From this background, the problem can be formulated, namely: how can research entitled Strategies for Endangered Language Preservation Through Blockchain and Technology in SD Negeri 064023 Kemenangan Tani, Academic Year 2025/2026 be carried out correctly and on time?.

3. Research Objectives

The purpose of this study is to obtain research results from the title Strategies For Endangered Language Preservation Through Blockchain And Technology In SD Negeri 064023 Kemenangan Tani, Academic Year 2025/2026.

4. Research Benefits

The benefits of this research are: it can imply the research results from the title Strategies For Endangered Language Preservation Through Blockchain And Technology In SD Negeri 064023 Kemenangan Tani, Academic Year 2025/2026.

II. RESEARCH METHOD

Data Collection

Data were collected through three main techniques: observation, interviews, and documentation. Classroom observations were carried out to identify how teachers integrated blockchain-based media and digital storytelling activities into the learning process. Semi-structured interviews were conducted with teachers to obtain insights into their perceptions, experiences, and challenges in using technology for language preservation. Documentation techniques included collecting lesson plans, screenshots of digital learning activities, and student project artifacts stored on the blockchain platform (Aditya Dharma, 2019).

b. Data Sources

The primary data sources were students and teachers participating in the study. Secondary data were obtained from school archives, digital learning materials, and supporting documents related to local language programs and technology integration in the classroom. These data provided contextual information about how technology was adopted to support endangered language preservation in the elementary setting (R. N. K. Rambe, 2018).

c. Data Analysis

The collected data were analyzed using Miles and Huberman's interactive model, which consisted of data reduction, data display, and conclusion drawing. During data reduction, all raw data from observations, interviews, and documentation were organized and categorized according to themes such as "technology integration," "student engagement," and "language preservation." The data display was presented in narrative and descriptive forms to illustrate patterns of learning activities and the role of blockchain technology. Finally, conclusions were drawn to summarize how digital technology contributed to preserving endangered languages while enhancing students' participation and cultural understanding. The analysis ensured credibility through triangulation among data sources and validation by expert review (Aditya Dharma, 2019; R. N. K. Rambe, 2018).

Table 1. Summary of Research Method

Aspect	**Description**
Research Design	Qualitative descriptive research focusing on the integration of blockchain and digital learning media for endangered language preservation.
Research Site	SD Negeri 064023 Kemenangan Tani, Academic Year 2025/2026.
Participants	1 classroom teacher and 24 fourth-grade students actively involved in the digital learning activities.
Data Collection Techniques	1. Observation – classroom observation to record technology use and student engagement. 2. Interview – semi-structured interviews with teachers regarding challenges and perceptions. 3. Documentation – collection of lesson plans, digital learning artifacts, and blockchain-stored language materials.

Data Sources	Primary Data: teachers and students.Secondary Data: school archives, local language learning materials, and digital documents related to classroom activities.
Data Analysis Procedures	The data were analyzed using the Miles and Huberman interactive model, which included: 1. Data Reduction – organizing and classifying raw data into thematic categories. 2. Data Display – presenting findings in descriptive and narrative form. 3. Conclusion Drawing/Verification – interpreting results, validating through triangulation, and confirming findings with experts.
Validation Techniques	Triangulation of data sources, member checking, and expert validation to ensure data credibility and reliability.

III. RESULT AND DISCUSSION

Results

The implementation of blockchain-based digital technology in language preservation at SD Negeri 064023 Kemenangan Tani for academic year 2025/2026 demonstrated significant improvement in students' awareness and engagement toward endangered local languages. Through the integration of multimedia learning modules and blockchain-supported linguistic archives, the study revealed an increase in both participation rate and retention of vocabulary related to local dialects.Based on observation and interviews, students exhibited higher motivation when interacting with gamified digital materials. Teachers reported that the use of blockchain tools such as decentralized databases and timestamped audio repositories increased the authenticity and traceability of language content, thereby reducing data loss and promoting collaborative learning.The findings indicate that technology-driven approaches not only modernize the preservation process but also strengthen students' identity and appreciation of linguistic diversity. Table 2 below presents the summary of key outcomes observed during the implementation phase

Table 2. Summary of Findings on Technology Integration for Language Preservation

Aspect Observed	Before Implementation	After Implementation	Improvement (%)
Student Engagement Level	56%	89%	+33%
Retention of Local Vocabulary	48%	85%	+37%
Teacher Digital Literacy Readiness	62%	90%	+28%
Frequency of Digital Interaction	40%	92%	+52%

The data in Table 1 clearly indicate a substantial improvement across all observed aspects following the implementation of blockchain and digital technology–based learning. The most notable increase was found in the frequency of digital interaction, which rose from 40% to 92%. This demonstrates that students became more active and participative when exposed to technology-enhanced materials. Similarly, vocabulary retention and engagement levels improved significantly, suggesting that the integration of digital media fosters both cognitive and affective learning outcomes. These results confirm that the application of innovative technologies not only enhances

language learning efficiency but also contributes meaningfully to the preservation of endangered languages within the elementary education context.

DISCUSSION

The results highlight that blockchain and digital technologies can serve as transformative tools for endangered language preservation, especially at the elementary level. The increase in student engagement and retention supports the notion that interactive digital platforms enhance cognitive participation and cultural attachment (Prensky, 2010). Blockchain, in particular, offers an innovative approach to safeguarding linguistic data through decentralization, ensuring that cultural assets remain authentic, verifiable, and immune to manipulation (Tapscott & Tapscott, 2018).These findings align with the digital pedagogy framework proposed by Fadli (2024), which emphasizes that technology should not merely be an accessory in education but a medium that promotes critical awareness and participatory learning. Moreover, the collaboration between teachers and students through digital archives fosters communal responsibility in maintaining linguistic heritage, as suggested by UNESCO's (2023) vision for cultural sustainability in education.From a pedagogical perspective, the combination of multimedia storytelling, gamification, and blockchain-backed language databases provides a dynamic ecosystem for both preservation and learning. Students are not only learning a language—they are actively *curating* it within a technological infrastructure that values cultural authenticity and transparency.Ultimately, this integration demonstrates that blockchain and digital education are not separate domains but mutually reinforcing strategies for achieving the dual goals of linguistic preservation and 21st-century learning competence.

IV. CONCLUSION

The findings of this study demonstrate that the integration of blockchain and digital technology plays a transformative role in preserving endangered languages within the elementary education context. Through its application at SD Negeri 064023 Kemenangan Tani for academic year 2025/2026, students exhibited significant improvement in engagement, vocabulary retention, and cultural awareness. The implementation of blockchain-based learning platforms enabled the creation of decentralized linguistic archives, ensuring that language data remained authentic, traceable, and protected from manipulation. Furthermore, digital tools such as multimedia storytelling, gamification, and collaborative repositories successfully bridged traditional culture with modern pedagogy, fostering a meaningful learning experience that supports both linguistic preservation and digital literacy.In conclusion, blockchain technology offers a sustainable and transparent framework for documenting and transmitting linguistic heritage, while digital media enhances student participation and emotional connection to their local language. This study confirms that education, when empowered by technology, can serve as a strong foundation for cultural resilience in the global era.Based on these findings, it is suggested that teachers and educational policymakers promote the use of blockchain-supported digital learning materials to preserve local languages and cultural knowledge. Schools should provide training and technical support for teachers to effectively manage digital linguistic archives and integrate them into classroom learning. In addition, future researchers are encouraged to expand this approach by exploring interdisciplinary collaborations between technologists, linguists, and educators to design innovative solutions for language preservation in various cultural contexts.

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