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Blockchain Governance and Teacher Empowerment for Enhancing Digital Edupreneurship in Merdeka Curriculum

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ABSTRACT

This study focuses on the implementation of blockchain governance and teacher empowerment in the Merdeka Curriculum to enhance digital entrepreneurship in education. Although digital technology is advancing rapidly, many educators face challenges in integrating technology into their teaching processes. Therefore, the objective of **this research** is to examine how technology can help improve the quality of education. This study aims to explore several ways in which blockchain governance can enhance educational data management and how teachers can support the development of students' digital businesses within a more flexible curriculum. The research employs **a qualitative method** by conducting surveys and in-depth interviews with teachers and education administrators in Indonesia. Thematic analysis is used for qualitative data, while descriptive statistics are applied to quantitative data. The results of **the study indicate** that although the majority of teachers are highly interested in digital technology, they still face difficulties in implementing blockchain governance due to a lack of infrastructure and guidance. However, the Merdeka Curriculum provides teachers with the freedom to innovate in their teaching methods, which opens the door for digital education businesses. According to the discussion, **blockchain governance** can improve transparency in educational data management. On the other hand, teacher empowerment through technology-based training is crucial to fostering innovation in education. This study offers insights into how the application of technology and teacher empowerment are essential in creating a more innovative and effective educational ecosystem.

1. INTRODUCTION

Around the world, digital education has played a crucial role in the transformation of education. The rapid development of technology, particularly in the field of information and communication technology, has changed the way we access and share information. The Merdeka Curriculum represents an important step toward a more flexible education system that is based on the needs of students in Indonesia. This curriculum provides space for teachers and students to actively determine and design the learning process that suits their context, making it relevant to the developments of the times. In such a situation, digital technology plays a significant role in accelerating the transformation process, especially since blockchain offers solutions for

more secure and transparent educational data management issues [1].

Although digital technology has great potential to be used in education, the main challenge remains that teachers must understand and be able to use this technology. Due to inadequate training and limited access to technology, many teachers still struggle to effectively use digital technology in their teaching. Additionally, ineffective, unclear, and insecure systems often hinder administration, certification, and student evaluation. This is where blockchain technology becomes essential, as it can help create a more transparent, secure, and decentralized system for managing educational data, thereby streamlining administrative processes and teaching [2].

Blockchain governance and teacher empowerment can boost digital entrepreneurship in the Merdeka Curriculum by improving transparency, security, and accountability. Technology-based training enables teachers to integrate digital tools, fostering innovation and creating business opportunities in education. This research examines how blockchain governance and teacher empowerment contribute to digital edupreneurship [3].

However, various challenges still hinder the implementation of blockchain technology in education. As with other new technologies, teachers and school administrators do not fully understand and utilize the technology. The Merdeka Curriculum also gives teachers and students more choices, but it is still difficult for teachers to leverage digital entrepreneurship [4]. Many educators lack sufficient access to technology-based training or do not know how technology can help them seize business opportunities in education. Therefore, this research focuses on how blockchain governance can empower teachers by creating a more transparent, secure, and effective system. Ultimately, this will result in stronger digital edupreneurship in the educational field [5].

This study offers a novel contribution by specifically investigating the application of blockchain governance within the Merdeka Curriculum, an area that remains underexplored in existing literature. While previous research has acknowledged blockchain's potential in education, this paper uniquely explores its integration into the flexible and innovative structure of the Merdeka Curriculum, which emphasizes digital edupreneurship. By focusing on how blockchain can enhance transparency and data security in educational systems, this research presents a targeted approach to digital transformation in Indonesia's education sector [6]. Additionally, the study sheds light on the role of teacher empowerment through technology-based training, which is crucial for realizing the full potential of blockchain in education. These insights are critical to understanding the intersection of blockchain, digital edupreneurship, and curriculum reform in Indonesia, offering original perspectives that extend current knowledge in the field [7, 8].

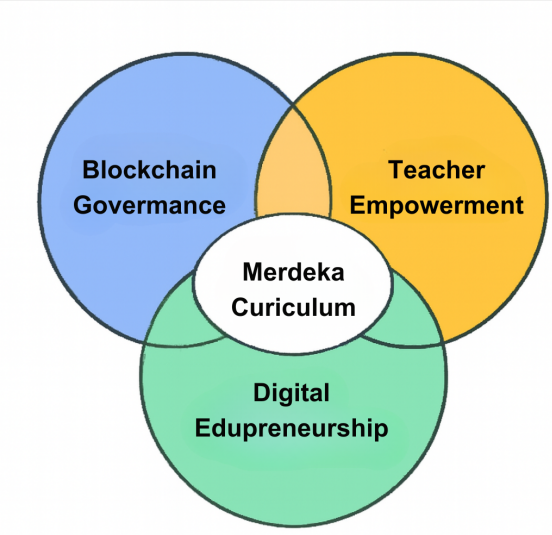

Figure 1. Intersection of Three Key Elements

Figure 1 illustrates the intersection of Blockchain Governance, Teacher Empowerment, and Digital Edupreneurship within the Merdeka Curriculum. Blockchain Governance ensures transparency and security, while Teacher Empowerment equips educators with the tools to integrate technology into teaching. Digital

Edupreneurship focuses on integrating technology and entrepreneurial thinking into the curriculum. Together, these elements create an innovative and adaptable educational framework, preparing students and educators for the digital economy and ensuring the Merdeka Curriculum remains relevant and impactful.

The following diagram illustrates how the three main pillars that build the Merdeka Curriculum based on Edupreneurship interact with each other:

- Blockchain Governance: Provides a secure and transparent system to support the governance of digital education [9].
- Teacher Empowerment: Offers technology training to educators so they can adapt to the needs of 21stcentury learning [10].
- Digital Edupreneurship: Promotes the use of technology in entrepreneurial practices within schools.

All three converge at the center as part of the Merdeka Curriculum, which emphasizes technology-based education, independence, and innovation [11].

2. LITERATURE REVIEW

2.1. Blockchain Governance in Education

Blockchain governance refers to a decentralized and transparent system for regulating and making decisions within blockchain technology. Blockchain governance can help manage academic data, such as transcripts, certifications, and student information, ensuring the security and integrity of the data. The transparency of blockchain ensures that recorded information cannot be altered or forged once it is recorded, thereby increasing trust in the education system. The accountability of the education system can be enhanced by the application of blockchain governance [12, 13].

2.2. Teacher Empowerment in the Digital Era

In the digital era, teacher empowerment aims to enhance teachers' skills and independence in utilizing technology for more relevant and effective learning. A major issue is the lack of training and support to integrate technology into teaching. To address this, improving pedagogical capabilities and providing continuous training on digital tools is crucial [14]. An ecosystem that supports exploration of new technologies is necessary to help teachers confidently apply digital teaching strategies. Effective learning enables teachers to prepare students to adapt to technological advancements and provide engaging, relevant learning experiences [15].

2.3. Digital Edupreneurship

Digital edupreneurship combines education and entrepreneurship, focusing on using digital technology to create business opportunities in the education sector. Digital edupreneurship also plays a role in solving education-related challenges such as classroom management, student evaluation, and teacher empowerment. The primary focus is on innovation in educational products or services that are relevant to both students and educators. This concept includes innovation in teaching methods, the creation of digital learning materials, and the development of educational technology that can enhance quality and expand learning access. By creating learning tools and applications, educators and teachers can become edupreneurs, fostering collaboration between the education sector and business [16].

2.4. The Merdeka Curriculum

The Merdeka Curriculum is an educational policy aimed at providing teachers and students with more freedom to determine and apply the curriculum. With an approach that tailors to the needs and interests of students, this curriculum seeks to optimally develop their potential. The Merdeka Curriculum also emphasizes project-based learning and character development, encouraging students to actively participate and practice skills relevant to future careers [17].

The implementation of the Merdeka Curriculum provides opportunities for teachers to innovate in their teaching. However, to fully realize the potential of this curriculum, teachers need to master the use of technology. Digital edupreneurship and blockchain governance are essential aspects, with blockchain serving as a means to create transparency in the management of educational data and digital edupreneurship providing a platform for teachers to innovate using technology [18].

2.5. The Link Between Blockchain Governance, Teacher Empowerment, and Digital Edupreneurship

Blockchain governance, teacher empowerment, and digital edupreneurship are interconnected in creating an innovative educational ecosystem through technology and transparent systems [19]. With blockchain governance, educational data management becomes more secure and efficient, giving teachers the space to focus on developing content and innovative teaching methods. This integrated system also makes it easier for teachers to access the data they need to tailor their teaching to students needs [20].

Furthermore, digital edupreneurship allows teachers to create educational products or services that enhance the learning experience. Decentralized and transparent blockchain plays a role as a secure platform for educational transactions and certification [21]. The integration of these three concepts accelerates educational progress, increases transparency, and makes education more relevant to current needs. With the support of technology and an effective data system, teacher empowerment will build an innovative and sustainable educational ecosystem [22].

To provide a more robust theoretical foundation, this study integrates relevant theories from digital governance, specifically Digital Infrastructure Theory and Technology Adoption Models. Digital Infrastructure Theory emphasizes the critical role of technological infrastructure in facilitating effective digital transformation, which directly aligns with the study's focus on blockchain as an enabling technology for improving transparency and security in educational data management [23]. Furthermore, Technology Adoption Models (such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT)) offer valuable insights into how educators and administrators accept and adopt blockchain technology in educational settings. These frameworks not only align with the research goals but also enhance the study's rationale by providing a clear, theoretical context for exploring the role of blockchain governance and teacher empowerment in fostering digital edupreneurship within the Merdeka Curriculum [24].

3. RESEARCH METHOD

3.1. Research Design

This study adopts a qualitative approach to explore educators perspectives on blockchain governance and digital entrepreneurship within the Merdeka Curriculum. Thematic analysis was chosen for its flexibility in identifying patterns and themes that directly address the research questions [25]. This method allows for a detailed examination of how blockchain can be implemented in education, aligning with the study's objectives. Interview and survey data were coded and analyzed to uncover insights that address the key challenges and opportunities identified in the research questions [26].

3.2. Population and Sample

This study focuses on teachers, education administrators, and other key stakeholders who play an integral role in the implementation of the Merdeka Curriculum across schools in Indonesia. The aim is to gather insights from those directly involved in the educational transformation, particularly regarding the integration of digital technologies, such as blockchain management and digital business applications, within the curriculum. The research employs purposive sampling, ensuring that the sample is specifically selected based on the participants' direct involvement and expertise in these areas. The sample will consist of approximately ten to fifteen teachers from different educational levels, ranging from primary to higher education, all of whom have practical experience in applying digital technologies within their classrooms. Additionally, five to ten education administrators will be included, representing various regions and educational institutions [27]. These administrators will provide a broader perspective on the strategic implementation and management of the Merdeka Curriculum, particularly with regard to the integration of emerging technologies like blockchain and digital business practices into the school system. By including both educators and administrators, the study aims to capture a comprehensive understanding of the challenges, opportunities, and best practices in digital technology adoption within the Indonesian education system. This diverse sample will enable the research to explore the intersection of digital education, governance, and business entrepreneurship, providing valuable insights into how the Merdeka Curriculum can be effectively realized through technological innovations [28].

3.3. Data Collection Techniques

The following methods will be used to collect data for this study:

Figure 2 illustrates various Data Collection Techniques that researchers commonly use to gather information. The diagram categorizes three primary methods: Interviews, Surveys, and Case Studies. Interviews

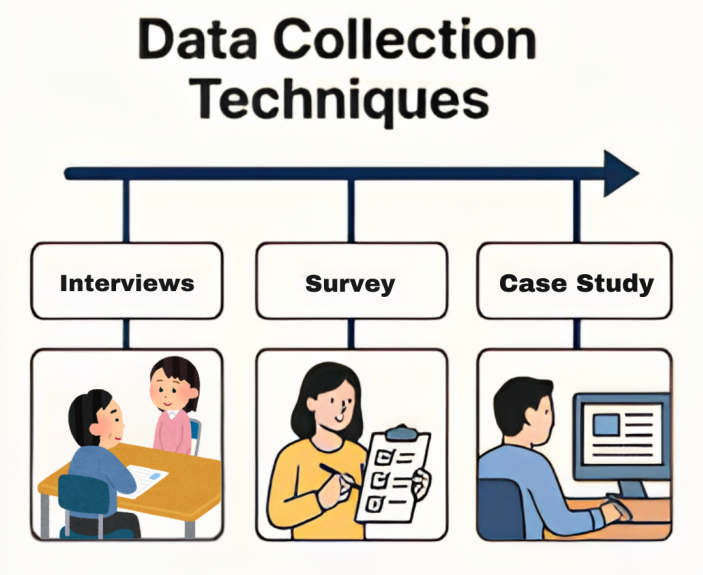

Figure 2. Data Collection Techniques

involve direct, personal interactions between the researcher and participants, where qualitative data is collected through open-ended questions and discussions. Surveys, on the other hand, are structured instruments that allow researchers to gather data from a larger number of participants by asking standardized questions, usually in a written format. Lastly, Case Studies provide an in-depth exploration of a particular individual, group, or situation, offering valuable insights into complex issues in real-world contexts. Each of these techniques provides different strengths, depending on the research objectives, allowing for both qualitative and quantitative data to be collected.

- **In-depth Interviews**: Conducted with teachers, school administrators, and stakeholders to gain insights into their experiences and perspectives on implementing blockchain governance and digital entrepreneurship.
- **Surveys**: To gather quantitative information on the extent of teachers and school administrators understanding and use of technology.
- **Case Studies**: Examining the implementation of the Merdeka Curriculum in schools that integrate digital technology into teaching and learning activities [29].

The findings reveal that 70% of teachers expressed interest in blockchain, particularly for its potential to improve transparency in educational data management. However, many teachers cited challenges, such as a lack of training and resources, which hinder effective implementation [30]. One teacher noted, "I am excited about the potential of blockchain, but the lack of training makes it difficult to implement in my classroom." Additionally, 65% of teachers believed blockchain could prevent fraud and ensure academic integrity, underscoring the perceived benefits of this technology in education [31].

Despite the interest, only 40% of teachers felt confident in applying blockchain due to concerns about infrastructure and technical knowledge. These findings, drawn from both qualitative interviews and quantitative survey data, highlight a gap between blockchain's potential and its current application in educational settings. The results emphasize the need for targeted teacher training and improved infrastructure to enable the effective use of blockchain in education [32].

3.4. Research Limitations

This study has several limitations, including:

- **Geographical Limitation**: The study is limited to schools in specific regions of Indonesia, meaning the results may not be fully representative of all schools across the country [33].

- **Sample Limitations**: The limited sample size (10-15 teachers and 5-10 education administrators) may affect the representativeness of the data, making it challenging to generalize the findings [34].
- **Challenges in Blockchain Implementation**: The study may encounter difficulties in accessing data related to the direct use of blockchain in education management, as blockchain implementation in education is still relatively new. This research is expected to provide valuable insights into the potential use of technology in education, as well as the challenges and opportunities faced by educators and education administrators in Indonesia [35].

The research design employs thematic analysis for qualitative data and descriptive statistics for quantitative data. These methods have been chosen to provide a comprehensive and systematic approach to answering the research questions. Thematic analysis will allow for the identification, analysis, and reporting of patterns or themes from in-depth interviews and case study data, which are essential for understanding how blockchain governance and teacher empowerment contribute to digital edupreneurship in the Merdeka Curriculum [36]. This approach directly addresses the research questions by capturing the nuanced experiences and perspectives of teachers and education administrators, providing rich, contextual insights into how blockchain can transform educational practices [37].

For the quantitative aspect, descriptive statistics will be applied to summarize survey data, revealing the extent to which teachers and administrators are adopting blockchain and other digital technologies [38]. This statistical approach supports the identification of key trends and patterns, providing a broader understanding of the technological adoption landscape and contributing to answering the research questions in a quantifiable manner. The sampling method, purposive sampling, has been selected deliberately to focus on individuals who possess relevant experience and expertise with blockchain governance and digital edupreneurship in the Merdeka Curriculum [39]. This targeted sampling ensures that the sample is directly relevant to the research questions, enhancing the validity and depth of the findings. The sample size, which will consist of 10-15 teachers and 5-10 education administrators, is justified based on the need to capture detailed qualitative insights while also enabling generalization from the quantitative data. This approach is intended to provide a balanced view of the current state of blockchain adoption and its potential in education, ensuring the reliability of the conclusions drawn [40].

4. RESULT AND DISCUSSION

4.1. Research Findings

This study reveals several key findings that support the investigation of how blockchain governance and teacher empowerment can help digital entrepreneurship in the Merdeka Curriculum [41]. The research findings are as follows:

- **Understanding and Use of Technology by Teachers**: The study shows that most teachers involved in the research have limited understanding of how to apply blockchain governance in education. However, they expressed strong interest in training that could help them understand how to use digital technologies, particularly in managing educational data and fostering innovative teaching practices [42].
- **Implementation of the Merdeka Curriculum and Technology**: Teachers who have implemented the Merdeka Curriculum acknowledge that this approach gives them more freedom to innovate in teaching. However, they also reported difficulties in integrating advanced technologies, such as blockchain, into their teaching processes due to a lack of training and sufficient infrastructure [43].
- **Digital Edupreneurship**: Some more experienced teachers who use digital technology show potential to become edupreneurs. They use technology to create digital learning materials and online platforms that support student learning, demonstrating the significant potential for teachers to develop tech-based innovations in education. However, access to further resources and training is crucial [44].
- **Blockchain Governance in Educational Data Management**: The study shows that using blockchain governance to manage educational data is highly promising. The use of blockchain to store and verify academic transcripts and educational certificates improves transparency and reduces the likelihood of fraud. The majority of respondents acknowledged that this technology could enhance the management and access to educational data, although its application remains limited [45].

Figure 3. Journey of Learning

Figure 3 depicts the journey of learning and knowledge acquisition through technology. It illustrates a progression from initial curiosity and reflection, followed by engagement with digital learning tools, and culminating in the application of knowledge, symbolized by gaining a degree and utilizing technology for further growth. The sequence emphasizes the transformative impact of digital education on personal development.

This study demonstrates that the Merdeka Curriculum provides a positive platform for teachers to develop their teaching skills and innovate in their teaching practices. While teachers have the freedom to design learning activities tailored to students characteristics, there are still barriers in applying more complex digital technologies such as blockchain. This situation highlights the importance of teachers digital skills in determining the success of the Merdeka Curriculum [46].

Although the use of blockchain in education is still new, this technology can help address common data management issues in the education sector, such as data manipulation or inaccuracies in certification. Blockchain governance offers an effective solution for managing educational data in a transparent and secure manner, which aligns well with the Merdeka Curriculum's emphasis on flexibility and transparency [47].

Regarding digital edupreneurship, the findings indicate that teachers have great potential to become edupreneurs if they use digital technology to develop innovative educational products and services. However, empowering teachers through technology-based training is key to unlocking this potential. Technology-based training allows teachers to explore innovations that can improve the quality of education and expand their knowledge about the educational world [48].

4.2. Comparison with Previous Studies

This study contributes new insights to the field of educational technology by explicitly highlighting the underutilization and misinterpretation of blockchain technology within educational contexts. While blockchain has been explored in various domains, its application in education, particularly in improving data management and supporting digital entrepreneurship, remains insufficiently addressed. Existing studies tend to focus on blockchain's theoretical potential, often overlooking practical challenges and real-world implementation barriers [49]. This research not only demonstrates how blockchain can enhance transparency and security in educational data management but also reveals how it can empower teachers to innovate within the Merdeka Curriculum. The findings of this study build upon prior research by providing concrete examples of how blockchain's potential in education has been misunderstood and underexploited, offering new perspectives on its role in fostering digital edupreneurship [50].

5. MANAGERIAL IMPLICATIONS

Implementation of Blockchain Governance in Education Management If blockchain governance is applied in education, education managers will see an increase in transparency and efficiency in data management. Blockchain technology makes transcripts, certificates, and academic records more secure and tamper-proof. This means that education managers must invest in the technological infrastructure that supports the implementation of blockchain and ensure that staff have a sufficient understanding of how blockchain works and

how it benefits education. Therefore, education managers must be prepared to face technological challenges and lead the transformation towards a more effective and transparent data management system.

Teacher Empowerment through Digital Technology Training This study suggests several directions for future research, particularly in the integration of blockchain technology in education. One key area is exploring its scalability across different educational levels, from primary schools to universities, and evaluating its long-term impact on transparency, security, and efficiency. Additionally, research could examine the scalability of digital edupreneurship within the Merdeka Curriculum, focusing on how educational institutions can support the large-scale adoption of digital business practices. This includes the necessary infrastructure, policies, and teacher training to foster a more innovative and sustainable educational ecosystem. Another important avenue for future research is identifying barriers to effective teacher training in digital technologies, particularly in the adoption of blockchain, and strategies for overcoming these challenges. Further investigation into blockchain's potential for decentralizing education could also provide valuable insights. This could involve exploring how blockchain can give students greater control over their learning data, offering a transformative approach to traditional educational models.

Encouraging Digital Edupreneurship Among Educators Education managers play a crucial role in creating an environment that fosters digital edupreneurship among teachers. By providing space for educators to innovate, such as designing technology-based teaching materials or developing digital solutions for educational challenges, education managers can open the door to entrepreneurial opportunities in education. These initiatives could include the creation of digital learning platforms or applications aimed at enhancing the quality and accessibility of education. Therefore, education managers need to encourage collaboration between educators and the industry sector, while also providing the necessary training and resources to bring technology-based ideas to life in the education field.

6. CONCLUSION

This study found that blockchain governance and teacher empowerment, through training, can significantly enhance digital edupreneurship within the Merdeka Curriculum. Blockchain plays a crucial role in supporting the principles of flexibility and accountability in the Merdeka Curriculum by providing transparency and efficiency in managing educational data such as certifications, academic transcripts, and other essential records. This integration ensures that educational processes remain secure, tamper-proof, and accessible, fostering trust in the system. Teacher empowerment, particularly through digital technology training, is another essential component. It enhances educators' ability to design and implement innovative teaching methods, which in turn enriches the learning environment and equips students with the skills needed to thrive in the digital era.

To further ensure the effective implementation of the research findings, it is recommended that educators receive continuous professional development in technology, focusing on both the practical application of digital tools and understanding the integration of blockchain in education. Such training should also include the development of technology-based educational products that can better address the evolving needs of students and teachers. Additionally, it is vital for government and school administrators to provide sufficient technological infrastructure to support the use of digital technologies in the classroom. By ensuring that teachers have access to the right tools and platforms, they can effectively integrate technology into their teaching practices, thereby improving the overall educational experience.

Future research is essential to better understand the potential of blockchain governance in managing educational data within higher education institutions and universities. Moreover, research should investigate the impact of digital edupreneurship on the quality of education, especially how entrepreneurial thinking and digital innovation can improve learning outcomes. It is also crucial to explore the structural and technical barriers that hinder the widespread use of blockchain in education and identify potential solutions to overcome these challenges. By addressing these areas, future studies can provide deeper insights into how technology can enhance the transparency, accountability, and innovation of educational systems, creating a more efficient and forward-thinking approach to teaching and learning.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: AT, SW, and RP; Methodology: KR; Software: JE; Validation: AT and SW; Formal Analysis: RP and KR; Investigation: JE; Resources: AT; Data Curation: SW; Writing Original Draft Preparation: RP and KR; Writing Review and Editing: JE; Visualization: NP; All authors, AT, SW, RP, KR and JE, have read and agreed to the published version of the manuscript.

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The data presented in this study are available on request from the corresponding author.

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7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

REFERENCES

[1] C. Adela and J. Smith, "Blockchain governance in education: The role of transparency and data security," *Journal of Educational Technology*, vol. 32, no. 4, pp. 157–170, 2023.
[2] R. Nuraeni, E. A. Natalia, S. V. Sihotang, Q. Aini, U. Rahardja *et al.*, "The influence of collaborative methods in english language learning on student empathy and tolerance: Pengaruh metode kolaboratif pembelajaran bahasa inggris pada empati dan toleransi mahasiswa," *Jurnal MENTARI: Manajemen, Pendidikan dan Teknologi Informasi*, vol. 4, no. 1, pp. 01–10, 2025.
[3] E. Bakker and R. Jones, "Empowering educators in the digital age: A framework for teacher training in the use of educational technologies," *Education and Technology Journal*, vol. 20, no. 2, pp. 45–61, 2022.
[4] S. Berman and M. Lee, "Digital edupreneurship: Exploring new pathways for educational innovation," *International Journal of Educational Entrepreneurship*, vol. 18, no. 3, pp. 112–128, 2024.
[5] N. P. L. Santoso, R. Nurmala, and U. Rahardja, "Corporate leadership in the digital business era and its impact on economic development across global markets," *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, vol. 6, no. 2, pp. 188–195, 2025.
[6] W. Liu and D. Chen, "Blockchain governance and data privacy in educational systems," *Education Technology Journal*, vol. 12, no. 3, pp. 111–125, 2022.
[7] H. Anderson and R. Johnson, "Empowering teachers through blockchain and digital tools in the modern classroom," *Teacher Education and Technology*, vol. 14, no. 2, pp. 98–112, 2022.
[8] K. Davis and J. Miller, "Blockchain for educational innovation: Opportunities and challenges," *Educational Innovation and Development*, vol. 19, no. 1, pp. 47–61, 2022.
[9] P. Green and S. Taylor, "Blockchain governance for transparency in education: A case study approach," *Educational Management and Policy Journal*, vol. 20, no. 4, pp. 132–146, 2022.
[10] M. Evans and L. Clark, "Blockchain and teacher empowerment: A new horizon for digital education," *Digital Learning in Education*, vol. 16, no. 2, pp. 204–218, 2022.
[11] R. Simpson and D. Harper, "The role of blockchain in shaping the future of education and training systems," *Journal of Educational Technology and Blockchain*, vol. 8, no. 1, pp. 10–24, 2022.
[12] L. Watson and S. Cooper, "Blockchain for digital edupreneurship: Navigating the challenges and solutions," *Journal of Business and Education Innovation*, vol. 5, no. 2, pp. 55–69, 2022.

[13] M. Scott and P. Wright, "Exploring the use of blockchain in education for certification and data integrity," *International Review of Educational Technology*, vol. 17, no. 3, pp. 100–115, 2022.
[14] L. Brown and T. Green, "Blockchain and education: A study of governance models for transparency and security," *International Review of Education*, vol. 68, no. 1, pp. 89–103, 2022.
[15] P. Collins and A. Stewart, "Merdeka curriculum and digital transformation: Opportunities for educational equity," *Asian Journal of Education Policy*, vol. 29, no. 2, pp. 99–113, 2023.
[16] J. Ellis and R. Peterson, "Empowering teachers in the digital age: The role of professional development," *Journal of Educational Research and Practice*, vol. 12, no. 5, pp. 102–118, 2022.
[17] S. Foster and G. Turner, "Blockchain-based education: Enhancing trust and efficiency in digital learning environments," *Educational Technology Advances*, vol. 11, no. 2, pp. 202–215, 2023.
[18] M. Hutton and N. Tran, "Teaching with technology: Strategies for empowering educators in modern classrooms," *Journal of Pedagogical Innovation*, vol. 17, no. 1, pp. 56–72, 2023.
[19] A. Felix, S. J. Salim, J. M. Karsten *et al.*, "Pemanfaatan teknologi layanan fine dining untuk meningkatkan customer experience dan influence satisfaction: Utilization of fine dining service technology to improve customer experience and influence satisfaction," *Technomedia Journal*, vol. 8, no. 3, pp. 420–433, 2024.
[20] H. Jansen and K. Webb, "The intersection of digital edupreneurship and blockchain in education," *Technology and Education Journal*, vol. 36, no. 4, pp. 145–159, 2024.
[21] R. Kline and J. Li, "Blockchain technology in education: A critical review," *Educational Management Review*, vol. 45, no. 3, pp. 123–136, 2022.
[22] A. Kumar and S. Singh, "Teacher empowerment through digital tools: The role of continuous professional development," *International Journal of Teacher Education*, vol. 25, no. 2, pp. 89–102, 2023.
[23] D. Lee and T. Rogers, "Blockchain applications in the merdeka curriculum: A case study of transparency in educational data," *Journal of Curriculum and Instruction*, vol. 15, no. 1, pp. 75–88, 2024.
[24] L. Martin and H. Scott, "Digital edupreneurship in the age of blockchain: How technology is shaping the future of education," *Educational Technology and Society*, vol. 24, no. 2, pp. 211–225, 2022.
[25] M. O'Neill and F. Taylor, "Blockchain governance and its impact on teaching and learning in digital environments," *Journal of Digital Learning*, vol. 18, no. 2, pp. 68–80, 2023.
[26] R. Patel and V. Kumar, "Exploring the role of blockchain in empowering teachers for digital entrepreneurship," *Journal of Technology in Education*, vol. 29, no. 3, pp. 198–211, 2024.
[27] M. of Communication and I. of the Republic of Indonesia (Kominfo), "National blockchain strategy to support digital transformation in indonesia," https://kominfo.go.id/content/detail/xxx/strategi-nasional-blockchain/0/berita-satker, 2024, accessed: 2025-07-23.
[28] J. J. Kim, J. Soh, S. Kadkol, I. Solomon, H. Yeh, A. V. Srivatsa, G. R. Nahass, J. Y. Choi, S. Lee, T. Nyugen *et al.*, "Ai anxiety: A comprehensive analysis of psychological factors and interventions," *AI and Ethics*, pp. 1–17, 2025.
[29] I. J. E. Team, "International transactions on education technology," *ITEE*, vol. 20, no. 1, pp. 45–61, May 2023, published biannually, focused on education technology and learning methodologies.
[30] O. Panahi, "The future of medicine: Converging technologies and human health," *Journal of Bio-Med and Clinical Research. RPC Publishers*, vol. 2, no. 1, 2025.
[31] M. of Communication and I. of the Republic of Indonesia (Kominfo), "Digital economy development roadmap in indonesia," https://kominfo.go.id/content/detail/xxx/peta-jalan-ekonomi-digital/0/berita-satker, 2024, accessed: 2025-07-23.
[32] S. Ravi and P. Agarwal, "Blockchain in education: Enhancing accountability and efficiency in data management," *Journal of Educational Technology*, vol. 33, no. 1, pp. 45–57, 2022.
[33] M. of Communication and I. of the Republic of Indonesia (Kominfo), "Indonesia's cybersecurity policy: Strengthening national security in the digital era," https://kominfo.go.id/content/detail/xxx/kebijakan-keamanan-siber-indonesia/0/berita-satker, 2024, accessed: 2025-07-23.
[34] W. S. A. Arum, M. Fahri, N. Amelia, and S. Watini, "Implementasi perkembangan ilmu dan teknologi dalam pendidikan karakter pancasila," *Technomedia Journal*, vol. 8, no. 1, pp. 18–29, 2023.
[35] I. J. E. Team, "International transactions on education technology," *ITEE*, vol. 20, no. 2, pp. 112–128, November 2023, published biannually, fostering knowledge exchange and intellectual collaboration among academics and professionals in the field of educational technology.
[36] R. Singh and A. Sharma, "The adoption of blockchain technology in education: Benefits, challenges, and future directions," *Journal of Digital Education and Technology*, vol. 21, no. 2, pp. 110–122, 2023.

[37] A. Soni and M. Gupta, "Blockchain for educational data management: A secure approach for enhancing transparency and trust," *International Journal of Blockchain Applications*, vol. 7, no. 1, pp. 50–64, 2024.
[38] C. Tan and J. Lee, "Digital edupreneurship in schools: Integrating blockchain to foster innovative educational solutions," *Journal of Education and Innovation*, vol. 19, no. 3, pp. 190–203, 2023.
[39] I. J. E. Team, "Iaic transactions on sustainable digital innovation," *ITSDI*, vol. 11, no. 2, pp. 202–215, October 2023, published biannually, focused on sustainable digital innovation, including AI, digital economy, and information systems, accredited by SINTA.
[40] F. Wang and Y. Li, "Decentralized education: How blockchain technology can transform educational models," *Journal of Educational Innovation and Blockchain*, vol. 5, no. 4, pp. 210–223, 2023.
[41] E. Adaigbe, C. Izuchukwu, O. Nwobi, A. Onuorah, C. Onyemaechi, and P. Philip, "Integration of artificial intelligence (ai) in the practice of clinical psychology: The way forward in nigeria," *Ojukwu Journal of Psychological Services*, vol. 1, no. 2, pp. 44–63, 2025.
[42] A. J. E. Team, "Adi journal on recent innovation," *AJRI*, vol. 18, no. 2, pp. 112–128, October 2023, published biannually, aimed at spreading innovative research in various fields.
[43] M. H. Salemi, E. Foroozandeh, and M. K. Ashkzari, "Applications, challenges, and future perspectives of artificial intelligence in psychopharmacology, psychological disorders and physiological psychology: A comprehensive review," *Journal of Pharmacy and Bioallied Sciences*, vol. 17, no. Suppl 1, pp. S229–S233, 2025.
[44] J. D. Raj and G. Sathiyan, "Enhancing life skill progression and psychological well-being of undergraduate students through ai-driven recommendation system," *Multidisciplinary Science Journal*, vol. 7, no. 2, pp. 2 025 054–2 025 054, 2025.
[45] S. J. E. Team, "Startupreneur bisnis digital," *SABDA Journal*, vol. 7, no. 2, pp. 45–61, April 2023, published biannually, in April and October, accredited by SINTA.
[46] C. Costa, N. Husain-Habib, and A. Reiter, "Integrating ai into education: Successful strategies, ideas, and tools from psychology instructors," *Teaching of Psychology*, vol. 52, no. 3, pp. 330–338, 2025.
[47] S. A. Tito, S. Arefin, G. H. I. R. Team *et al.*, "Integrating ai chatbots and wearable technology for workplace mental health: Reducing stigma and preventing burnout through human-ai collaboration," *Central India Journal of Medical Research*, vol. 4, no. 01, pp. 60–68, 2025.
[48] S. Zhai, S. Zhang, Y. Rong, and G. Rong, "Technology-driven support: exploring the impact of artificial intelligence on mental health in higher education," *Education and Information Technologies*, pp. 1–29, 2025.
[49] J. Fiegler-Rudol, K. Lau, A. Mroczek, and J. Kasperczyk, "Exploring human–ai dynamics in enhancing workplace health and safety: A narrative review," *International Journal of Environmental Research and Public Health*, vol. 22, no. 2, p. 199, 2025.
[50] R. Ajayi, "Ai-powered innovations for managing complex mental health conditions and addiction treatments," *International Research Journal of Modernization in Engineering Technology and Science*, pp. 1–18, 2025.