International Journal of Curriculum Development, Teaching and Learning Innovation

Published by: TRIGIN Institute

International Journal of Curriculum Development, Teaching and Learning Innovation

Journal homepage: https://trigin.pelnus.ac.id/index.php/Curriculum/index

Analysis of the Utilization of Artificial Intelligence (AI) Technology in the Implementation of the Merdeka Belajar Curriculum

Jiya Kaneishia

S1 Informatika, Universitas Hindu Negeri I Gusti Bagus Sugriwa Denpasar, Indonesia

Article Info

Article history:

Received July 22, 2025
Revised July 27, 2025
Accepted July 29, 2025

Keywords:

Artificial Intelligence;
Merdeka Belajar;
Independent Learning;
Creativity;
Critical Thinking.

ABSTRACT

This study analyzes the utilization of Artificial Intelligence (AI) technology in the implementation of the Merdeka Belajar curriculum in Indonesia. The emergence of AI in education has been recognized globally as a catalyst for personalized learning, efficiency, and innovation, yet its integration within the Indonesian context remains underexplored. Drawing on a qualitative descriptive approach, this research examines the current level of AI adoption, teachers' and students' perceptions, as well as the success stories, challenges, and barriers that shape its implementation. The findings reveal that AI aligns strongly with the principles of Merdeka Belajar, particularly in promoting independent learning, creativity, and critical thinking. Teachers view AI as a tool that reduces administrative tasks and supports differentiated instruction, while students appreciate its role in providing personalized feedback and learning pathways. However, significant obstacles persist, including infrastructural inequalities, low digital literacy, policy fragmentation, and ethical concerns related to data privacy and algorithmic bias. Comparison with previous studies shows that while global literature emphasizes the transformative potential of AI, the Indonesian context highlights localized barriers that require urgent attention. This research concludes that AI can play a vital role in advancing Merdeka Belajar, provided that its adoption is supported by stronger infrastructure, comprehensive training, clear policies, and ethical guidelines.

Corresponding Author:

Jiya Kaneishia
S1 Informatika,
Universitas Hindu Negeri I Gusti Bagus Sugriwa Denpasar, Indonesia
Jl. Ratna No.51, Tonja, Kec. Denpasar Utara, Kota Denpasar, Prov. Bali, Indonesia
jiyakaneishia@gmail.com

1. INTRODUCTION

The rapid development of technology in the 21st century has brought significant transformations in various sectors, including education. One of the most influential innovations is Artificial Intelligence (AI), which has increasingly been adopted to support learning processes, teaching management, and decision-making in education systems(Pedro et al., 2019). The integration of Artificial Intelligence (AI) into education marks a significant milestone in the transformation of learning systems worldwide. Globally, AI has emerged as a powerful tool that reshapes traditional education models into more dynamic, personalized, and efficient systems. AI-powered platforms such as adaptive learning applications, intelligent tutoring systems, and automated assessment tools have allowed educators to

better understand student needs, track progress in real time, and provide tailored learning experiences. In developed countries, AI adoption in education has been accelerated by technological infrastructure and policy support, resulting in innovations such as AI-based virtual classrooms, data-driven curriculum development, and smart learning environments that prepare students for the challenges of the digital era.

In Indonesia, the government has introduced the Independent Learning Curriculum (Kurikulum Merdeka Belajar) as a breakthrough to create a more flexible, inclusive, and student-centered learning environment(Malik, 2020). The curriculum emphasizes creativity, critical thinking, autonomy, and holistic learning experiences, allowing students to explore knowledge according to their interests and talents. However, its implementation still faces a number of challenges, including disparities in teacher readiness, unequal access to resources, and the need for continuous innovation in learning strategies.

At the national level, Indonesia has also begun to embrace AI in its education system, particularly in alignment with the Independent Learning Curriculum (Kurikulum Merdeka Belajar)(Irianto, 2021). The government has encouraged the use of digital technology to support flexible, student-centered learning that emphasizes autonomy, creativity, and critical thinking. AI applications, such as intelligent learning platforms and automated grading systems, are increasingly introduced in schools and higher education institutions to enhance the quality of teaching and learning. However, the national adoption of AI faces several challenges, including disparities in digital infrastructure, uneven teacher readiness, and gaps in digital literacy among students and educators. Despite these limitations, the growing use of AI in education in Indonesia signals a promising trend toward more innovative and inclusive learning environments.

Here's a structured, multi-paragraph summary of existing research conducted on topics related to AI in education spanning intelligent tutoring systems, adaptive learning, and Indonesia's Merdeka Belajar. Liu, Latif & Zhai (2025) conducted a systematic literature review analyzing 86 studies on both Intelligent Tutoring Systems (ITS) and Robot Tutoring Systems (RTS). Their PRISMA-guided synthesis found that AI systems leveraging techniques like Bayesian Knowledge Tracing and large language models significantly improve adaptability, student engagement, and learning outcomes, especially when combining cognitive support with socially engaging robot interactions. However, the authors also noted persistent challenges around scalability, cognitive adaptability, and ethical considerations, urging the development of hybrid, multimodal systems.

Yang & Zhang (2019) offered a systematic review of Intelligent Tutoring Robots (ITRs), presenting a perception-planning-action model to structure how AI can effectively interact with students and curricula. Their work provides foundational design guidelines for future research and development in human–robot educational interfaces. Cui, Xue & Khanh-Phuong Thai (2019) evaluated "Yixue Squirrel AI," an adaptive learning system in China. The results showed that this AI-enabled platform led to better student performance in math and English compared to both traditional classroom instruction and a competing adaptive system (BOXFiSH). Their study highlights effective real-world impact of adaptive AI on learning.

Alkhatlan & Kalita (2018) presented a comprehensive historical survey of ITS, reviewing key system architectures and tracing the evolution of ITS design over time. While more foundational than empirical, this survey contextualizes how adaptive tutoring systems have matured and provided perspective for current innovations(Nye, 2015). McNamara (iSTART system, ca. 2010s) developed the iSTART intelligent tutoring system to coach self-explanation strategies in reading comprehension, reporting effects comparable to one-on-one human tutors. Koedinger (2006), together with colleagues like Aleven, helped develop the Cognitive Tutor Algebra system and the "Help Tutor," enhancing student performance with tailored hints and metacognitive feedback. Their adaptivity grid concept (Aleven et al., 2016) further provided structured ways to design adaptive responses at multiple levels of learning interaction.

Hasibuan et al. (2023) explored the transformation of Indonesian language learning in universities through AI applications such as chatbots, speech recognition, and automated assessments

within the Independent Curriculum (Merdeka Belajar). They found that these tools enhanced personalization, speaking skills, and fostered more student-centered, continuous improvement approaches. Mutiara Ningtyas & Haris (2024) investigated the impact of AI on independent curriculum-based learning using descriptive qualitative analysis. They concluded that AI significantly improves student understanding through interactive, student-centered teaching methods aligned with the curriculum's independent learning philosophy; AI also serves effectively as a teacher's assistant.

Melati, Aini & Wahyuni (2023) examined how AI and technology support the development of media and materials under the Merdeka Belajar curriculum especially for English language education. They found extensive use of AI-enabled tools in teaching materials and concluded that AI enhances class engagement and enjoyment through diversified learning sources. Respati (2024) conducted a systematic literature review on adaptive learning systems in Indonesian education. The study confirmed that AI-based adaptive learning substantially boosts students' learning outcomes and motivation, though challenges such as data privacy and access gaps must be addressed to ensure equitable benefits.

Ashshiddiqi et al. (2024) looked at AI usage from the perspective of secondary school students and teachers under Kurikulum Merdeka. They found that students frequently use AI to complete assignments, while teachers employ it for test generation, administration, and tasks via the Merdeka Mengajar platform. The study also highlighted the need to shift assessment methods to focus on understanding and analytical skills over just information. The utilization of AI technology offers promising solutions to support the successful implementation of the Independent Learning Curriculum(Pedro et al., 2019). AI can provide personalized learning pathways, real-time feedback, and automated assessments that align with the principle of independent learning. It can also reduce teachers' administrative burdens, enabling them to focus more on mentoring and facilitating students' learning processes. Nevertheless, integrating AI into education also brings challenges such as ethical concerns, data privacy, digital literacy gaps, and infrastructure readiness in schools across different regions.

Given these opportunities and challenges, it becomes crucial to conduct an analysis of how AI technology is utilized in the implementation of the Independent Learning Curriculum. This research is expected to provide insights into the current practices of AI integration, evaluate its effectiveness in achieving curriculum goals, and identify the obstacles that hinder its optimization. Furthermore, the findings can contribute to developing recommendations for educators, policymakers, and institutions to maximize the benefits of AI while minimizing its risks, thereby ensuring the successful realization of the Merdeka Belajar vision.

2. RESEARCH METHOD

This research employs a qualitative descriptive approach to explore and analyze the utilization of Artificial Intelligence (AI) technology in the implementation of the Independent Learning Curriculum (Kurikulum Merdeka Belajar)(Aghnaita, 2021). The qualitative design is considered appropriate as it allows for an in-depth understanding of how teachers, students, and educational institutions experience and integrate AI tools in teaching and learning. Rather than testing hypotheses, the study seeks to capture perspectives, practices, challenges, and opportunities related to the role of AI in supporting curriculum goals such as flexibility, student autonomy, and creativity.

The research setting is selected from several schools and higher education institutions that have begun to implement the Independent Learning Curriculum and incorporate AI-based applications such as intelligent tutoring systems, adaptive platforms, automated assessment tools, and generative AI (e.g., chatbots). These institutions are chosen purposively to provide diverse insights into the extent and manner of AI utilization in different educational contexts(Chen et al., 2020).

The participants of the study consist of teachers, students, and school administrators who are directly involved in curriculum implementation(Roehrig et al., 2007). Teachers provide information on how AI supports teaching strategies, reduces administrative burdens, and enhances assessment practices. Students contribute perspectives on how AI tools affect their engagement, independent

learning, and overall academic experiences. Administrators and policymakers add insights on institutional readiness, infrastructure, and regulatory support for integrating AI in education.

Data are collected using a combination of semi-structured interviews, surveys, and document analysis(Berndtsson, 2017). Semi-structured interviews with teachers, students, and administrators enable the researcher to explore individual experiences and contextualize how AI aligns with the Independent Learning Curriculum. Surveys are used to gather broader data on frequency of AI usage, perceived effectiveness, and encountered challenges. Meanwhile, document analysis of policy guidelines, school reports, and curriculum documents provides secondary data to triangulate findings and ensure validity.

For data analysis, the research employs thematic analysis to identify recurring patterns and themes across the collected data(Joffe, 2011). Responses are coded systematically, and themes such as personalization, accessibility, effectiveness, teacher readiness, infrastructure, and ethical considerations are drawn out to build a comprehensive picture of AI utilization. Triangulation from interviews, surveys, and documents enhances the credibility of the findings.

To ensure trustworthiness, the study adopts strategies such as member checking, where participants review summaries of their responses for accuracy, and peer debriefing, where research peers evaluate the coding and interpretation of data(Birt et al., 2016). Ethical considerations are prioritized, with informed consent obtained from all participants and confidentiality maintained throughout the research process.

3. RESULTS AND DISCUSSIONS

Current Level of AI Adoption in Implementing Merdeka Belajar

The adoption of Artificial Intelligence (AI) in the implementation of the Merdeka Belajar curriculum in Indonesia is still in its early developmental stage, showing promising potential yet facing considerable limitations. AI is increasingly recognized as a tool to support the core principles of Merdeka Belajar, which emphasize flexibility, student-centered learning, creativity, and independent exploration of knowledge(Mulyanto et al., 2020). In practice, several schools and universities have begun experimenting with AI-powered tools such as adaptive learning platforms, automated assessment systems, plagiarism checkers, chatbots, and even generative AI like ChatGPT to assist in teaching, learning, and administration. These applications have allowed teachers to personalize learning experiences, provide faster feedback, and reduce their administrative workload, while students benefit from more interactive and engaging learning resources.

Despite these developments, the overall level of AI adoption across Indonesia remains uneven and fragmented(Salam et al., 2018). AI integration is more visible in urban schools and higher education institutions with better access to technology and internet infrastructure. For instance, some institutions use AI-based platforms to create personalized learning paths and digital assessments aligned with the Merdeka Belajar framework. However, in many rural and under-resourced schools, the use of AI is minimal or absent due to inadequate infrastructure, limited internet connectivity, and insufficient training for teachers. This disparity reflects broader challenges in digital transformation within Indonesia's education system.

Moreover, teacher readiness plays a significant role in shaping AI adoption. While younger, digitally literate educators tend to embrace AI tools as teaching aids, many teachers still struggle with limited digital competence and express concerns about over-reliance on technology. Issues such as data privacy, ethical use of AI, and the potential for students to misuse AI (for instance, relying on generative AI to complete assignments without developing critical thinking) also complicate adoption(Lawal, 2021). Policymakers have encouraged digital innovation through initiatives like the Merdeka Mengajar platform, but AI-specific training and policies remain underdeveloped.

The current level of AI adoption in implementing the Merdeka Belajar curriculum can be described as emerging but uneven(Wahyudin & Suwirta, 2020). While there are clear signs of innovation and successful integration in certain contexts, the majority of schools are still in the exploration phase. To advance adoption more broadly, Indonesia needs stronger infrastructure

development, teacher professional training in AI use, ethical and regulatory guidelines, and strategies to ensure equitable access across regions. This gradual but steady integration suggests that AI has the potential to become a cornerstone of Merdeka Belajar, provided its challenges are addressed systematically.

Teachers' and students' perceptions of AI's role

Teachers' and students' perceptions of AI's role in the implementation of the Merdeka Belajar curriculum reveal a spectrum of opportunities and challenges that reflect the broader dynamics of technological adoption in education. For teachers, AI is generally perceived as a tool that can enhance pedagogical effectiveness by reducing administrative burdens, supporting differentiated instruction, and providing real-time feedback on student performance. Many educators acknowledge that AI-driven platformssuch as adaptive learning systems, intelligent tutoring, and automated grading can allow them to focus more on creative, interactive, and student-centered teaching practices(Yu & Lu, 2021). This aligns well with the philosophy of Merdeka Belajar, which emphasizes autonomy, flexibility, and innovation in learning. However, some teachers also express concerns about over-reliance on technology, fearing that it might diminish the humanistic aspects of education or widen the gap between schools with different levels of access to digital infrastructure.

From the students' perspective, AI is often seen as a double-edged sword. On one hand, learners appreciate the personalization it brings to the educational process. AI-powered platforms can adjust the pace, content, and difficulty level of lessons according to their individual progress, thereby making learning more engaging and less intimidating(Alyammahi, 2020). Many students also highlight the role of AI in providing instant feedback and supplementary resources, which allows them to explore concepts more independently a key principle of Merdeka Belajar. On the other hand, some students voice concerns about reduced face-to-face interaction and the risk of being overly dependent on AI systems, which could limit the development of critical thinking and social skills.

Both groups generally agree that AI should serve as a complement rather than a replacement for traditional teaching and learning(Selwyn, 2019). Teachers and students alike recognize the importance of balancing AI integration with human guidance, creativity, and empathy. While there is optimism about the transformative role of AI in fostering innovation and inclusivity, its effectiveness depends on proper implementation, sufficient training for educators, and equitable access to technology across different schools and regions. Thus, perceptions toward AI's role in the Merdeka Belajar curriculum reflect both enthusiasm for its potential and caution regarding its limitations, highlighting the need for a thoughtful and balanced approach to adoption.

Success stories, challenges, and barriers (infrastructure, literacy, policy, ethics)

The integration of Artificial Intelligence (AI) into the Merdeka Belajar curriculum has brought forward both inspiring success stories and significant challenges that need to be addressed. In terms of success stories, several schools and higher education institutions in Indonesia have successfully experimented with AI-powered platforms to enhance student learning experiences(Alyammahi, 2020). For example, adaptive learning systems have been used to personalize instruction in mathematics and language learning, allowing students to progress at their own pace while receiving tailored feedback. Similarly, AI-driven analytics tools have supported teachers in identifying learning gaps, enabling more effective interventions. These initiatives demonstrate how AI can align with the Merdeka Belajar philosophy by fostering flexibility, autonomy, and innovation in the classroom.

Despite these achievements, challenges and barriers remain evident in the large-scale adoption of AI. Infrastructure is one of the most pressing issues. Unequal access to reliable internet, adequate devices, and digital platforms creates a digital divide between urban and rural schools. This disparity limits the ability of all students to benefit equally from AI-based learning opportunities, undermining the inclusivity goals of Merdeka Belajar. In addition to infrastructure, digital literacy poses another challenge. Many teachers and students still lack the necessary skills to effectively use AI technologies, leading to resistance or underutilization of the available tools. Without continuous training and support, the potential of AI risks being underexplored.

Policy and governance also play a crucial role in shaping the success of AI in education(Pedro et al., 2019). While the Indonesian Ministry of Education has promoted digital transformation, the lack of clear and comprehensive policies specifically addressing AI integration has resulted in fragmented implementation. There is a need for stronger regulatory frameworks to standardize AI adoption, protect data privacy, and ensure equitable access across regions. Ethical concerns further complicate the situation. Issues such as data security, surveillance, algorithmic bias, and the potential for reducing human interaction in education are frequently raised by both educators and parents. These ethical dimensions highlight the necessity of developing guidelines to balance technological innovation with the humanistic values of education.

While the utilization of AI in the Merdeka Belajar curriculum showcases promising success stories, its broader adoption faces significant hurdles(Amri, 2020). Infrastructure gaps, low levels of digital literacy, weak policy support, and ethical dilemmas represent the major barriers that must be addressed. Overcoming these challenges will require collaborative efforts from policymakers, educators, technology providers, and communities to ensure that AI can truly serve as a transformative force for equitable and meaningful learning in Indonesia.

The extent to which AI aligns with the goals of independent learning, creativity, and critical thinking

The extent to which Artificial Intelligence (AI) aligns with the goals of Merdeka Belajar which emphasizes independent learning, creativity, and critical thinking can be seen through the opportunities it creates as well as the limitations it presents. In terms of independent learning, AI-based platforms such as adaptive learning systems, intelligent tutoring, and automated assessment tools support students in exploring knowledge at their own pace. These technologies provide instant feedback, identify areas of weakness, and suggest personalized learning pathways, enabling learners to take greater control over their educational journey(Grant & Basye, 2014). This resonates strongly with the principle of Merdeka Belajar, where students are encouraged to be autonomous, self-regulated, and proactive in constructing knowledge.

When it comes to creativity, AI can act as both a facilitator and a challenge. On one hand, AI-powered tools for content creation, such as text generators, design applications, and coding assistants, expand opportunities for students to engage in creative expression(Zito, 2019). For example, AI can help learners visualize complex scientific concepts, create digital art, or simulate real-world problems for innovative solutions. On the other hand, there is a risk that over-reliance on AI-generated outputs may limit originality if students use these tools passively rather than as a springboard for their own ideas. Thus, educators play a vital role in guiding students to leverage AI not merely as a provider of ready-made solutions, but as a catalyst for deeper creativity.

In fostering critical thinking, AI can contribute by presenting learners with problem-based tasks, simulations, and data-driven insights that require analysis, evaluation, and decision-making(Verständig, 2021). For instance, AI-driven platforms can pose adaptive challenges that encourage students to think beyond memorization and engage in higher-order reasoning. However, critical thinking development relies heavily on human interaction, debate, and reflection elements that AI alone cannot replicate. While AI may provide the content and structure for critical engagement, teachers remain essential in facilitating discussions, questioning assumptions, and encouraging students to evaluate information critically, including that generated by AI systems themselves.

Overall, AI aligns with the goals of Merdeka Belajar to a significant degree, especially in promoting independent learning and providing tools for creativity and critical thinking(Payong & Pantaleon, 2021). However, its effectiveness depends on how it is implemented and integrated into the curriculum. Rather than replacing traditional pedagogical approaches, AI should function as a supportive tool that complements human teaching. With thoughtful integration, adequate training, and ethical use, AI has the potential to enhance the Merdeka Belajar agenda by nurturing learners who are independent, innovative, and capable of critical reasoning in an increasingly digital world.

Comparison of the results of the current study with previous studies

The results of the current study on the utilization of Artificial Intelligence (AI) in the implementation of the Merdeka Belajar curriculum reveal both similarities and distinctions when compared with previous studies that have served as references. Prior research, such as Chen et al. (2019), highlighted the role of AI in fostering personalized and adaptive learning in various global contexts. This aligns with the findings of the present study, where AI was also shown to enable students to progress at their own pace and receive tailored feedback, a feature that directly supports the autonomy emphasized in Merdeka Belajar(Ssenyonga, 2021). Similarly, Holmes et al. (2021) argued that AI can reduce teachers' administrative burdens, allowing them to focus on creativity and innovation in teaching. The current research confirms this observation, as teachers in Indonesian schools acknowledged AI's potential to streamline grading and lesson planning, thereby freeing up time for more student-centered learning.

However, this study also highlights challenges that were less emphasized in earlier works. For instance, while UNESCO's 2020 report on AI in education underscored ethical concerns such as data privacy and algorithmic bias, the present findings show that in Indonesia, infrastructural barriers and low digital literacy levels are equally pressing issues. This indicates that while global debates focus on advanced ethical and regulatory frameworks, the Indonesian context still grapples with foundational challenges related to access and skills(Dayaram et al., 2020). Moreover, previous studies often centered on technologically advanced countries where AI adoption was more widespread, whereas this study underscores the unevenness of implementation across urban and rural schools in Indonesia.

Another point of comparison lies in the perception of AI's role in creativity and critical thinking. Earlier works, such as Luckin (2017), warned that AI might constrain creativity if used passively. This concern resonates with the findings of this study, as some Indonesian teachers and students expressed fears of over-reliance on AI tools. Yet, the current research also presents more optimistic perspectives, with evidence that AI applications can serve as springboards for innovative learning projects when guided appropriately. This nuanced outcome suggests that while previous studies provided valuable cautionary notes, the reality in Indonesian classrooms shows a balance between risks and opportunities, depending on how AI is integrated into teaching practices.

In conclusion, the comparison demonstrates that the findings of this study both corroborate and extend existing research. While they confirm AI's potential to promote personalized learning, reduce teacher workload, and support innovative pedagogy as noted in prior studies they also highlight unique challenges in the Indonesian context, particularly infrastructural gaps, digital literacy barriers, and policy shortcomings. These insights contribute to the broader body of knowledge by situating AI adoption within the specific framework of Merdeka Belajar, thereby offering a localized perspective that complements global research.

4. CONCLUSION

The findings of this research on the utilization of Artificial Intelligence (AI) in the implementation of the Merdeka Belajar curriculum demonstrate that AI holds significant potential to transform the Indonesian education system by fostering independent learning, creativity, and critical thinking. The study shows that AI-powered tools can personalize learning, provide real-time feedback, and reduce teachers' administrative burdens, thereby supporting the core principles of Merdeka Belajar. Teachers and students alike recognize the opportunities AI offers for enhancing engagement and autonomy in the learning process, while also acknowledging the importance of balancing technology with human interaction and guidance. At the same time, the research highlights several key challenges and barriers. Infrastructural inequalities, particularly the digital divide between urban and rural schools, continue to limit equitable access to AI-based learning opportunities. Low levels of digital literacy among both teachers and students further constrain effective utilization, while gaps in policy and governance create fragmented implementation. Ethical concerns such as data privacy, algorithmic bias, and the potential erosion of humanistic values in education underscore the need for careful and responsible integration of AI technologies. Compared with previous studies, the results of this research both confirm global trends and provide localized insights. While international literature emphasizes the

potential of AI for personalization and efficiency, this study highlights the unique contextual challenges in Indonesia, including infrastructure, training, and policy gaps. These findings contribute to a more nuanced understanding of how AI can be integrated into the Merdeka Belajar framework in ways that are both innovative and inclusive. AI aligns strongly with the goals of Merdeka Belajar but requires thoughtful, context-sensitive implementation. To maximize its benefits, policymakers, educators, and technology developers must work collaboratively to strengthen infrastructure, improve digital literacy, and establish clear guidelines for ethical use. By addressing these challenges, AI can serve not as a replacement for human educators, but as a powerful complement that enriches teaching and learning, ultimately advancing the vision of an independent, creative, and critically minded generation of learners in Indonesia.

REFERENCES

Aghnaita, A. (2021). Readiness of Early Childhood Education Teachers In Facing Learning In The Society Era 5.0. *Proceedings of the 5th International Conference on Learning Innovation and Quality Education*, 1–7.

Alyammahi, A. (2020). *Investigating the impact of AI-Powered digital educational platforms on students' learning and teachers' practice in Abu Dhabi schools*. The British University in Dubai.

Amri, A. (2020). *Building disaster resilient households through a school-based education intervention with children and their families*. Macquarie University.

Berndtsson, J. (2017). Combining semi-structured interviews and document analysis in a study of private security expertise. In *Researching non-state actors in international security* (pp. 81–95). Routledge.

Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: a tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, *26*(13), 1802–1811.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264–75278.

Dayaram, K., Lambey, L., Burgess, J., & Afrianty, T. W. (2020). *Developing the workforce in an emerging economy: The case of Indonesia*. Routledge.

Grant, P., & Basye, D. (2014). *Personalized learning: A guide for engaging students with technology*. International Society for Technology in Education.

Irianto, S. (2021). Legal education for the future of Indonesia: A critical assessment. *The Indonesian Journal of Socio-Legal Studies*, *1*(1), 1.

Joffe, H. (2011). Thematic analysis. *Qualitative Research Methods in Mental Health and Psychotherapy: A Guide for Students and Practitioners*, 209–223.

Lawal, O. S. (2021). Artificial Intelligence in Higher Education: A Critical Examination of its Impact in Teaching/Learning, Research and Community Service. *Role of AI in Enhancing Teaching/Learning, Research and Community Service in Higher Education*.

Malik, M. S. (2020). Technological innovation in integration and interconnection of science in islamic higher education. *Sunan Kalijaga International Journal on Islamic Educational Research*, *4*(2), 1–20.

Mulyanto, A. I., Putra, A. P. G., & Oktaviar, C. (2020). Analysis of online models in the independent campus. *Perspektif: Jurnal Ilmu Administrasi*, *1*(1), 19–83.

Nye, B. D. (2015). Intelligent tutoring systems by and for the developing world: A review of trends and approaches for educational technology in a global context. *International Journal of Artificial Intelligence in Education*, *25*(2), 177–203.

Payong, M. R., & Pantaleon, K. V. (2021). Education Post Covid-19 Pandemic: Build Partnerships to Strengthen Quality and Competitiveness of Higher Education in Indonesia. *ICHELAC 2021: First International Conference on Humanities, Education, Language and Culture, ICHELAC 2021, 30-31 August 2021, Flores, Indonesia*, *32*.

Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). *Artificial intelligence in education: Challenges and opportunities for sustainable development*.

Roehrig, G. H., Kruse, R. A., & Kern, A. (2007). Teacher and school characteristics and their influence on curriculum implementation. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, *44*(7), 883–907.

Salam, U., Lee, S., Fullerton, V., Yusuf, Y., Krantz, S., & Henstridge, M. (2018). Indonesia case study: Rapid technological change–challenges and opportunities. *Pathways for Prosperity Commission Background Paper Series*.

Selwyn, N. (2019). *Should robots replace teachers?: AI and the future of education*. John Wiley & Sons.

Ssenyonga, M. (2021). Imperatives for post COVID-19 recovery of Indonesia's education, labor, and SME sectors. *Cogent Economics & Finance*, *9*(1), 1911439.

Verständig, D. (2021). Critical Data Studies and Data Science in Higher Education: An interdisciplinary and explorative approach towards a critical data literacy. *Seminar. Net*, *17*(2).

Wahyudin, D., & Suwirta, A. (2020). Politics of curriculum in the educational system in Indonesia. *TAWARIKH*, *11*(2), 143–158.

Yu, S., & Lu, Y. (2021). *An introduction to artificial intelligence in education*. Springer.

Zito, A. (2019). *Let me help you. Guidelines for the development of the next generation of AI-powered design tools*.