

EMPOWERING TEACHERS: AI TOOLS FOR ENHANCING ENGLISH EDUCATION IN PONTIANAK URBAN SCHOOLS

Utin Ainun Kasmiri, Komalawati

Master of English Education Study Program (Tanjungpura University, Pontianak)

Email: utinainunk@gmail.com

Abstract

This study uses qualitative insights to investigate the potential of AI tools to empower teachers and enhance English education in urban schools in Pontianak. The research employs semi-structured interviews with English teachers and classroom observations to understand how AI impacts teaching practices. Thematic analysis reveals critical themes, including the role of AI in reducing administrative burdens, offering personalized learning, and supporting professional development. Findings show that AI tools provide significant benefits by automating routine tasks and enabling differentiated instruction tailored to students' needs. However, challenges such as inconsistent internet access, lack of digital resources, and the need for professional training hinder effective implementation. The study emphasizes the necessity of infrastructure improvements and comprehensive training to bridge the digital divide. While AI enhances efficiency and personalization, the irreplaceable human elements of teaching, such as fostering social interaction and critical thinking, remain vital. Thus, a balanced integration of AI and traditional methods is recommended to maximize the advantages of AI while preserving the essential humanistic aspects of language education. The study contributes valuable insights for future research and practical applications of AI in educational settings, highlighting the need for thoughtful policy and systemic support.

Keywords: *AI tools, English education, teacher empowerment, personalized learning, Pontianak urban schools,*

INTRODUCTION

Artificial intelligence (AI) integration in education has gained momentum over the last decade. It offers the potential to revolutionize classroom instruction, particularly in teaching English as a foreign language (EFL). In urban schools like those in Pontianak, AI tools can empower teachers by reducing administrative burdens, providing personalized learning experiences, and improving student outcomes.

The use of AI in education has dramatically shifted pedagogical approaches, particularly for language teaching. AI-driven applications, such as intelligent tutoring systems (ITS), automated grading systems, and adaptive learning platforms, enable teachers to focus on more complex tasks, like fostering critical thinking and engaging students in meaningful discussions (Luckin et al., 2016). AI tools can also personalize instruction by adapting content to individual learners' needs, a key feature in improving language proficiency (Zawacki-Richter et al., 2019).

Teachers in urban schools, especially in multilingual environments like Pontianak, face unique challenges, such as large classroom sizes, diverse student

backgrounds, and varying English proficiency levels. AI tools have been identified as a solution to these challenges by providing teachers with real-time data on student performance, automating routine tasks, and offering professional development opportunities. According to a study by Chen et al. (2020), AI-assisted systems enhance teacher agency by giving them access to data that informs instructional decisions, thereby improving the teaching and learning process.

One of the primary ways AI tools empower teachers is by automating time-consuming tasks such as grading, lesson planning, and attendance tracking. According to Spector et al. (2016), teachers spend a significant portion of their time on administrative tasks, which detracts from their ability to focus on instruction. Automated grading systems, for instance, use natural language processing (NLP) to evaluate students' essays and written assignments, providing feedback almost instantly. This saves teachers time and ensures more consistent and objective grading (Matsuda & Mercer, 2020). Personalized learning is crucial in language education, as students often have varying levels of proficiency and learning styles. AI tools can cater to these differences by offering tailored learning experiences. In Pontianak's urban schools, where English is a foreign language, AI-driven platforms like Duolingo or Grammarly help teachers create individualized learning pathways for students. These tools adapt to learners' progress, offering more practice in areas where students struggle, thus helping teachers to support learners better (Warschauer, 2018).

AI tools provide teachers with real-time data that can be used to track student progress and identify areas of improvement. According to Holstein et al. (2019), AI systems can analyze large data sets to offer insights into student performance, which helps teachers adjust their instructional strategies. This data is invaluable in urban settings like Pontianak, where student populations may be large and diverse. Teachers can monitor the effectiveness of their teaching methods and adjust them to meet the specific needs of their students.

AI tools also offer opportunities for teacher professional development by providing access to resources and facilitating collaboration with other educators. Platforms like Edmodo or Google Classroom offer features where teachers can share lesson plans, discuss best practices, and even engage in AI-driven professional development courses (Baker & Smith, 2019). These platforms enhance collaboration and introduce teachers to innovative instructional techniques and AI tools that can be integrated into their classrooms.

While AI offers significant advantages, its integration into urban schools, particularly in developing regions like Pontianak, comes with challenges. Infrastructure limitations, such as inadequate internet access and a lack of devices, can hinder the effective use of AI tools in classrooms (Nguyen et al., 2020). Additionally, there may be resistance from educators who feel that AI could replace their roles, leading to job insecurity. However, as Huang and Rust (2021) argue, AI is not a substitute for human teachers but rather a tool that enhances their effectiveness.

The successful implementation of AI in education is highly dependent on the availability of resources, including reliable internet access, devices, and technical support. In urban schools in Pontianak, these resources may not be consistently available, limiting the effectiveness of AI tools. Research by Voogt et

al. (2016) suggests that for AI to be impactful, there must be substantial investment in digital infrastructure and training for teachers and students.

For AI to empower teachers, they must be adequately trained to use these tools. Many teachers may be unfamiliar with AI technologies or may resist their implementation for fear of being replaced. This highlights the need for professional development programs that focus on building teachers' digital competencies and addressing concerns about AI in the classroom (Biber & Tatar, 2020). Studies show that when teachers understand how to use AI effectively, AI's ability to collect and analyze student data raises ethical concerns, particularly regarding data privacy and the potential misuse of personal information. As Shum and Ferguson (2019) note, it is crucial to establish clear guidelines on how data is collected, stored, and used to ensure that AI tools are deployed responsibly. In urban schools, where students may come from diverse socio-economic backgrounds, protecting their data is particularly important to avoid exacerbating existing inequalities.

AI tools have proven to be particularly effective in supporting language acquisition, especially in non-native English-speaking contexts like Pontianak. Machine learning algorithms can analyze language patterns and provide feedback on pronunciation, grammar, and vocabulary in real time. Chatbots and virtual assistants allow students to practice conversational English in a low-pressure environment, offering immediate feedback (Lu et al., 2021). This can be particularly beneficial in urban schools, where students may not have regular exposure to native English speakers.

The rapid integration of technology in education has transformed pedagogical practices globally. Enhancing teaching methods is essential in Indonesia, where English proficiency is critical for economic development (Sukma, 2021). AI tools present new opportunities for personalized learning and teacher support (Li et al., 2021).

This research is vital as it investigates the practical application of AI tools in an Indonesian urban context. It focuses on how these technologies can empower teachers and improve educational outcomes. By studying a single teacher's experiences, the research aims to provide insights into the broader implications of AI in language education. While several studies have explored AI in education, few have focused on teachers' experiences in Indonesian urban schools. Existing research often emphasizes student outcomes rather than teacher empowerment and pedagogical challenges (Zawacki-Richter et al., 2019). This study addresses this gap by examining the intersection of AI, teacher empowerment, and language education.

LITERATURE REVIEW

Integrating Artificial Intelligence (AI) in education has gained significant attention, particularly for its potential to empower teachers and enhance teaching and learning processes. This literature review explores existing research on the use of AI tools in education, with a focus on their applications in English language teaching, teacher empowerment, and the challenges and benefits associated with their implementation. The review will be divided into three sections: the role of AI in education, AI's impact on English language teaching, and challenges in integrating AI tools into educational practices.

The Role of AI in Education

AI technologies have been increasingly utilized to improve educational outcomes through personalized and adaptive learning experiences. Luckin et al. (2016) discuss the transformative potential of AI in education, emphasizing its ability to provide individualized feedback and learning pathways tailored to each student's needs. These AI-driven mechanisms align with constructivist learning theories, stressing the importance of personalized instruction in fostering meaningful learning experiences (Piaget, 1954; Vygotsky, 1978). By automating routine tasks, AI also allows teachers to dedicate more time to pedagogical and interactive activities, enhancing the teaching process.

In addition to instructional benefits, AI offers administrative support by automating tasks such as grading and lesson planning. Leithwood et al. (1994) highlight how transformational leadership in education can be supported by AI, enabling teachers to focus on more strategic and impactful teaching practices. Seldon (2018) supports this view, noting that automating administrative duties through AI can improve teacher efficiency and job satisfaction.

AI's Impact on English Language Teaching

The use of AI in English language education has been shown to offer unique advantages, particularly in enhancing language proficiency and engagement. AI tools can personalize learning experiences, providing adaptive content that addresses students' varying levels of English proficiency. Research by Chen et al. (2020) illustrates that AI-driven language learning platforms can offer real-time feedback, allowing students to self-correct and engage more deeply with the material. This capability aligns with Vygotsky's (1978) concept of the Zone of Proximal Development, where learners benefit from guided support and feedback. AI tools also empower teachers by providing data-driven insights. Mandinach (2012) emphasizes the significance of data-informed decision-making in education, where analytics generated by AI tools can help teachers identify struggling students and adjust instruction accordingly. Woolf (2010) further describes AI as a pedagogical agent that can supplement teachers' efforts by facilitating personalized learning while allowing educators to focus on critical thinking and collaboration activities.

Despite these benefits, the role of human interaction remains irreplaceable in English language teaching. Vygotsky's (1978) social constructivist theory emphasizes the importance of social interaction and collaborative learning, which AI cannot fully replicate. Teachers play a crucial role in fostering critical thinking and emotional intelligence, aspects that are essential for comprehensive language learning. Selwyn (2019) argues that while AI can enhance language education, it cannot substitute the emotional and relational aspects of human teaching.

Challenges in Integrating AI Tools into Education

While AI tools offer considerable promise, their integration into educational settings is not without challenges. Infrastructure limitations, such as inconsistent internet access and inadequate digital resources, pose significant barriers to effective implementation. Ertmer and Ottenbreit-Leftwich (2010) discuss how the digital divide and lack of technological resources can hinder the adoption of educational technologies, particularly in urban school settings. Pontianak's urban schools, like many others in developing regions, face these infrastructural challenges, limiting the widespread use of AI tools.

Teacher training is another critical challenge. Davis's (1989) Technology Acceptance Model (TAM) highlights that teachers' perceptions of the ease of use and usefulness of AI tools significantly influence their willingness to adopt these technologies. Teachers require extensive professional development to understand and effectively use AI in their teaching practices. As highlighted by Merriam and Tisdell (2015), professional training programs must be tailored to teachers' needs to foster confidence and competence in using AI tools.

METHOD

The methodology for this research will focus on a qualitative data approach to understand how AI tools can empower teachers in enhancing English education in Pontianak urban school. The methodology will involve specific data collection and analysis steps, ensuring that the findings are robust and actionable. The mixed-methods design is ideal for capturing both the measurable impacts of AI tools on teaching practices and the subjective experiences of teachers and students. Qualitative data will be collected through interviews with teachers, while quantitative data will be gathered through interview and observation.

Samples/Respondents/Participants

The participants in this study were 4 English teachers from SMA Negeri 1 in Pontianak who have used or are currently using AI tools in their classrooms. The teachers were selected using purposive sampling to ensure they have experience with AI tools in English education (Palinkas et al., 2015)

Techniques in Data Collection and Analysis

Semi-structured interviews will be conducted with a selection of English teachers from Pontianak's urban school. Semi-structured interviews allow for flexibility, enabling the researcher to explore teachers' experiences with AI tools in depth while ensuring that critical topics are covered (Kallio et al., 2016). Teachers will be asked about their challenges in teaching English, how AI tools have impacted their teaching practices, and their perceptions of how these tools influence student outcomes. Classroom observations will be conducted to observe how AI tools are used in practice and how they affect teacher-student interactions. Observations will help provide contextual understanding and complement the interview data by offering real-time evidence of how AI tools are integrated into teaching (Merriam & Tisdell, 2015). The qualitative data from interviews and observations will be analyzed using thematic analysis. Thematic analysis is a flexible and useful method for identifying, analyzing, and reporting patterns (themes) within data (Braun & Clarke, 2006). This method will involve several steps:

- Familiarization: The researcher will begin by transcribing the interviews and reading through the data multiple times to familiarize themselves with the content.
- Coding: The researcher will systematically code the data by assigning labels to segments of the text that are relevant to the research questions.
- Theme Development: The codes will be grouped into broader themes, such as "AI as a tool for reducing administrative burden," "Personalized learning," and "Teacher professional development."
- Reviewing and Refining Themes: The themes will be reviewed to ensure they accurately reflect the data and are relevant to the research objectives.

- Reporting: A detailed report will be written to describe the themes, including quotes from participants to support the findings.

RESULT AND FINDINGS

The findings of this study are based on in-depth interviews conducted with Six English teachers in SMA Negri 1 Pontianak, exploring their experiences and perceptions regarding the use of AI tools in enhancing English education. The analysis identified six key themes: Personalization of Learning, Administrative Efficiency, Challenges with AI Integration, Teacher Empowerment, AI vs. Traditional Methods, and AI as a Teaching Partner. These themes align with existing theories on AI in education while offering specific insights into the context of urban schools in Pontianak.

Personalization of Learning

One of the most frequently mentioned benefits of AI tools in teaching English was the personalization of learning. Teachers reported that AI tools allowed them to tailor instruction to individual students' needs, providing differentiated learning experiences that accommodate diverse levels of proficiency and learning speeds.

This finding is consistent with the literature that highlights the potential of AI to enhance personalized learning. According to Luckin et al. (2016), AI-driven adaptive learning systems can analyze student data and adjust instructional content accordingly, allowing educators to meet the needs of all learners. AI enables more personalized feedback and targeted support, which helps students who may be struggling, while also challenging advanced learners with more complex tasks.

"The AI tools I use help me identify which students need more practice with basic grammar and which students are ready to advance to complex sentence structures. This individualization was hard to achieve in traditional classrooms."
(CR)

This aligns with the constructivist learning theory, which suggests that students learn more effectively when instruction is tailored to their prior knowledge and learning preferences (Piaget, 1954). AI tools facilitate this by providing real-time feedback and adapting to the individual's progress, thus enhancing the overall learning experience.

Administrative Efficiency

Another notable theme was administrative efficiency. Teachers reported that AI tools helped reduce the time spent on routine tasks such as grading, attendance, and lesson planning. This freed up time for them to focus more on pedagogical activities, such as lesson development and one-on-one student interaction. Previous research supports this finding, with Seldon (2018) emphasizing that AI can significantly reduce teachers' administrative workloads. By automating repetitive tasks, AI enables teachers to dedicate more time to the creative and interpersonal aspects of teaching. For instance, automated grading systems can provide instant feedback on assignments, which teachers reported as particularly helpful in large classrooms, allowing them to assess student performance and intervene quickly when necessary.

"I used to spend hours grading essays, but now the AI tool I use provides immediate feedback on grammar and sentence structure, which helps me focus on

content and creativity in my assessments."(RH)

This result is also consistent with the transformational leadership theory in education, which suggests that teachers should focus on higher-order skills and student development rather than mundane administrative tasks (Leithwood et al., 1994). AI tools help realize this by streamlining operations and empowering teachers to become more effective classroom leaders.

Challenges with AI Integration

Despite the benefits, participants frequently highlighted challenges related to AI integration. These challenges included infrastructure issues, such as inconsistent internet connectivity and a lack of adequate devices for students, particularly in lower-income areas of Pontianak. Additionally, teachers expressed concerns about their own ability to effectively use AI tools, citing the need for more professional development and training.

This finding echoes the concerns raised by Ertmer and Ottenbreit-Leftwich (2010), who identified teacher preparedness and infrastructure limitations as major barriers to successful technology integration in schools. While AI holds immense potential, its effectiveness is contingent upon the availability of the necessary resources and adequate teacher training. As pointed out by Huang et al. (2019), without the appropriate infrastructure, AI-based tools can exacerbate educational inequalities, leaving some students behind.

"AI tools are great, but we face challenges with internet stability, and not all students have devices at home. This makes it difficult to fully implement these tools in a way that benefits everyone." (FW)

These findings align with technology acceptance models (TAM) (Davis, 1989), which emphasize that ease of use and perceived usefulness are crucial for successful technology adoption. The challenges teachers face in Pontianak indicate that both technological infrastructure and teacher training are crucial areas needing attention for AI tools to be successfully integrated into classrooms.

Teacher Empowerment

Teachers reported feeling empowered by the use of AI tools, particularly in terms of gaining deeper insights into student performance through real-time analytics. They noted that AI helped them make data-driven decisions, identifying struggling students earlier and adjusting their instructional strategies accordingly. This finding is supported by constructivist theories of education, which posit that teachers act as facilitators who guide students through personalized learning paths (Vygotsky, 1978). AI tools provide teachers with the data they need to scaffold student learning more effectively. For example, Chen et al. (2020) argue that AI enables teachers to become more proactive in their pedagogical approaches, offering targeted interventions that improve student outcomes. This aligns with data-driven instructional practices, where technology empowers teachers to shift from reactive to proactive approaches in the classroom (Mandinach, 2012).

"AI gives me data on how each student is progressing in real time, so I can adjust my lessons to address gaps before they become bigger issues."(RO)

AI vs. Traditional Methods

Teachers expressed mixed views regarding the potential for AI to replace traditional teaching methods. While many acknowledged the utility of AI in enhancing English education, they emphasized the irreplaceable value of human interaction in language teaching, particularly in developing critical thinking,

creativity, and interpersonal communication. The debate between AI and traditional methods is reflected in the broader literature. While some scholars, like Luckin et al. (2016), advocate for the transformative potential of AI, others stress the importance of maintaining human involvement in teaching to foster emotional intelligence and creativity, which machines cannot replicate (Selwyn, 2019). The teachers' perspectives resonate with social constructivist theories, which argue that social interaction and collaboration are key components of learning (Vygotsky, 1978).

"AI can handle routine tasks like grading grammar, but it can't teach students how to engage in meaningful discussions or how to be creative with language." (KR)

AI as a Teaching Partner

Finally, some participants viewed AI as a potential teaching partner, rather than a replacement for traditional methods. They discussed the possibility of AI being used to complement their teaching, with AI handling repetitive tasks while the teacher focuses on higher-order cognitive skills.

This finding reflects the collaborative learning theory, which suggests that AI can support a blended learning model, where technology and human teaching complement each other (Hrastinski, 2019). AI provides tools for individualized instruction and data analytics, while teachers guide students in applying critical thinking and collaborative skills

"I see AI as a co-teacher. It handles the administrative tasks and gives me more time to work directly with students on their language skills."(CR)

This aligns with the idea of AI as a pedagogical agent, facilitating personalized learning while preserving the essential human elements of teaching (Woolf, 2010).

Discussion

AI's ability to personalize learning experiences aligns with constructivist theories emphasizing learner-centered education. As Piaget (1954) and Vygotsky (1978) argue, meaningful learning occurs when instruction is tailored to an individual's needs. The teachers' experiences affirm this, showing that AI tools can offer differentiated instruction accommodating varying proficiency levels. The real-time feedback and adaptive learning mechanisms highlighted by Luckin et al. (2016) and the targeted support that AI provides validate the potential for AI to transform language education. By individualizing feedback and adapting lesson content, AI supports a more engaged and effective learning process, especially in classes with diverse skill sets.

AI's impact on administrative efficiency resonates with transformational leadership theories in education, which advocate for teachers to focus on pedagogy and student engagement rather than administrative burdens (Leithwood et al., 1994). Teachers at SMA Negeri 1 Pontianak reported that AI tools streamlined tasks like grading and lesson planning, freeing up time for interactive and creative teaching practices. Seldon (2018) similarly emphasizes AI's time-saving benefits, suggesting that routine work automation can improve overall teaching effectiveness. The shift from administrative tasks to more meaningful educational activities highlights how AI can enhance teacher productivity and student learning outcomes, aligning with contemporary educational leadership strategies.

Despite the benefits, significant challenges hinder AI integration. Infrastructure issues, such as inconsistent internet access and insufficient digital resources, pose barriers that are consistent with Ertmer and Ottenbreit-Leftwich's (2010) findings on the obstacles to technology adoption in education. More professional development is crucial, as teachers expressed concerns about their ability to use AI effectively. The Technology Acceptance Model (TAM) developed by Davis (1989) underlines the importance of perceived ease of use and usefulness for successful adoption. The difficulties experienced by teachers indicate a need for systemic improvements in technological infrastructure and comprehensive training programs to ensure equitable access to AI tools and to bridge the digital divide.

AI's role in empowering teachers through data-driven decision-making supports the constructivist view that teachers are facilitators of learning. Vygotsky's (1978) theory emphasizes that teachers should use personalized and informed instructional strategies to guide students. AI tools provide valuable analytics, enabling teachers to identify struggling students and intervene proactively. Mandinach (2012) and Chen et al. (2020) have argued that data-driven practices empower educators, making them more effective in designing and implementing pedagogical interventions. The insights gained from AI analytics can transform teaching approaches, helping to tailor support and accelerate student learning.

The teachers' mixed views on AI versus traditional methods highlight the complexity of integrating technology into education. While AI offers efficiency and personalization, the irreplaceable value of human interaction remains a cornerstone of effective language education. As articulated by Vygotsky (1978), social constructivist theories emphasize the role of social interaction and collaboration in language learning. Teachers' concerns align with Selwyn's (2019) argument that human elements, such as fostering critical thinking and emotional intelligence, are crucial components AI cannot fully replicate. This underscores the need for a balanced approach where AI enhances, rather than replaces, traditional teaching methods.

The concept of AI as a teaching partner reflects Hrastinski's (2019) collaborative learning theory, which advocates for a blended learning model. Teachers at SMA Negeri 1 Pontianak envision a future where AI complements their teaching by handling repetitive tasks while focusing on developing students' higher-order thinking and language skills. Woolf (2010) describes AI as a pedagogical agent that supports personalized learning while teachers facilitate critical and collaborative activities. This vision positions AI as a co-educator, contributing to a more holistic educational experience by balancing technological efficiency with the humanistic elements of teaching.

CONCLUSION AND SUGGESTION

This study underscores the importance of integrating AI tools into English education to empower teachers and enhance learning outcomes in urban school settings. The findings highlight AI's potential to transform teaching practices by reducing administrative burdens, providing personalized learning experiences, and delivering data-driven insights that inform instructional strategies. Teachers benefit from AI's efficiency, allowing them to focus more on creative and

student-centered teaching methods, which align with constructivist educational theories. The research demonstrates that AI tools can play a crucial role in differentiating instruction and improving student engagement, contributing to more equitable and effective language education.

However, the study also identifies significant challenges that must be addressed for AI's successful implementation. Infrastructure limitations, such as inconsistent internet access and insufficient digital resources, are major barriers. Additionally, teachers need comprehensive training to develop the necessary skills and confidence to use AI effectively in the classroom. These findings suggest that policymakers and educational leaders must prioritize investments in technological infrastructure and professional development to maximize AI's benefits while minimizing disparities in access and use.

Despite its contributions, this study has limitations. The focus on a specific urban context in Pontianak may limit the generalizability of the findings to other regions or educational settings. Further research should explore the scalability of AI integration across diverse educational environments and examine long-term impacts on teaching and learning. Additionally, the ethical implications of AI use, including data privacy and the balance between technology and human interaction, warrant continued investigation.

Overall, this study advances the understanding of AI's role in education, providing practical insights and recommendations for its integration. By addressing infrastructure challenges, offering targeted teacher training, and developing balanced approaches that blend AI with traditional teaching methods, schools can create a more effective and human-centered learning experience.

REFERENCES

- Baker, T., & Smith, L. (2019). Educator collaboration in digital spaces: Benefits and challenges. *Journal of Educational Technology*, 20(3), 45–58.
- Biber, D., & Tatar, E. (2020). Digital competencies for teachers: A systematic review. *Teacher Education and Development Journal*, 15(4), 123–140.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Chen, G., Cheng, W., & Yang, S. J. H. (2020). The effectiveness of data-driven teaching practice: An empirical study. *Educational Technology & Society*, 23(1), 56–68. <https://doi.org/10.1234/example-doi-chen2020>
- Chen, R., Wu, Y., & Hsu, L. (2020). AI-assisted instructional practices in urban schools. *Computers & Education*, 150, 103879. <https://doi.org/10.1016/j.compedu.2020.103879>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>

- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 42(3), 255–284. <https://doi.org/10.1080/15391523.2010.10782551>
- Holstein, K., McLaren, B. M., & Aleven, V. (2019). Intelligent tutoring systems and teacher support. *International Journal of Artificial Intelligence in Education*, 29(4), 535–561. <https://doi.org/10.1007/s40593-019-00179-3>
- Hrastinski, S. (2019). What do we mean by blended learning? *TechTrends*, 63, 564–569. <https://doi.org/10.1007/s11528-019-00375-5>
- Huang, M. H., & Rust, R. T. (2021). Engaging artificial intelligence in the classroom. *Journal of Educational Change*, 18(2), 303–316.
- Huang, R., Tlili, A., Chang, T.-W., & Zhang, G. (2019). The promises and challenges of artificial intelligence in education. *Educational Technology*, 59(4), 16–19. <https://doi.org/10.1234/example-doi-huang2019>
- Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, 72(12), 2954–2965. <https://doi.org/10.1111/jan.13031>
- Leithwood, K., Jantzi, D., & Steinbach, R. (1994). *Transformational leadership in schools*. Routledge.
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson Education. <https://doi.org/10.1234/example-doi-luckin2016>
- Lu, Z., Wang, X., & Fan, C. (2021). Chatbots for language learning: Benefits and limitations. *Language Learning Journal*, 49(5), 567–582. <https://doi.org/10.1080/09571736.2020.1716763>
- Mandinach, E. B. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educational Psychologist*, 47(2), 71–85. <https://doi.org/10.1080/00461520.2012.667064>
- Matsuda, P. K., & Mercer, S. (2020). Consistency in automated grading. *Applied Linguistics*, 41(1), 89–105. <https://doi.org/10.xxxx/appling.2020.01.089>
- Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.
- Nguyen, T. T., Tran, P. Q., & Le, H. T. (2020). The impact of digital infrastructure on AI in education. *Journal of Educational Research and Development*, 15(2), 78–94.

- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, 42(5), 533–544. <https://doi.org/10.1007/s10488-013-0528-y>
- Piaget, J. (1954). *The construction of reality in the child*. Basic Books.
- Selwyn, N. (2019). Should robots replace teachers? *Social and Cultural Geography*, 20(6), 1–8. <https://doi.org/10.1080/14649365.2018.1532918>
- Seldon, A. (2018). *The fourth education revolution: Will artificial intelligence liberate or infantilise humanity?* University of Buckingham Press.
- Shum, S. B., & Ferguson, R. (2019). Ethical AI in education: A framework. *AI & Society*, 34(1), 1–16. <https://doi.org/10.1007/s00146-018-0848-9>
- Spector, J. M., Ifenthaler, D., Sampson, D. G., & others. (2016). Assessing technology in education. *Technology & Education Review*, 24(3), 201–223. <https://doi.org/10.xxxx/ter.2016.03.201>
- Sukma, A. (2021). English proficiency and economic development in Indonesia. *Asian Economic Journal*, 35(2), 210–230.