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INTEGRATING ARTIFICIAL INTELLIGENCE (AI) IN LANGUAGE EDUCATION: TRANSFORMING PEDAGOGICAL PRACTICES AND ENHANCING LEARNER AUTONOMY IN THE 21ST CENTURY

Raya Puspita Raharjo[1*], Gunawan[2]
[1,2] *Universitas Negeri Semarang*
**Corresponding author: rayaprhhrjo@unnes.ac.id*

Abstrak *- Integrasi Kecerdasan Buatan (Artificial Intelligence/AI) dalam pendidikan bahasa semakin menonjol pada abad ke-21, mengubah secara mendasar cara guru dan peserta didik berinteraksi dengan input linguistik, alat pedagogis, serta mekanisme penilaian. Penelitian ini menelaah peran transformatif AI dalam meningkatkan praktik pedagogis dan mendorong kemandirian belajar (learner autonomy) dalam konteks pembelajaran bahasa Inggris. Dengan menggunakan desain mixed-methods (metode campuran), penelitian ini melibatkan 80 guru bahasa Inggris dan 200 siswa dari Indonesia, Singapura, dan Australia. Data kuantitatif dikumpulkan melalui survei yang mengukur persepsi terhadap lingkungan pembelajaran berbasis AI, sementara data kualitatif diperoleh melalui wawancara dan observasi kelas. Hasil penelitian menunjukkan bahwa alat pembelajaran berbasis AI secara signifikan meningkatkan pembelajaran yang dipersonalisasi, ketepatan berbahasa, dan keterlibatan metakognitif siswa. Para guru melaporkan adanya pergeseran dari model pembelajaran yang berpusat pada pengajar menuju model yang berpusat pada peserta didik, sedangkan siswa menunjukkan peningkatan motivasi dan kemandirian belajar. Namun, penelitian ini juga menemukan tantangan terkait literasi digital, etika penggunaan, serta ketergantungan berlebihan terhadap teknologi. Penelitian ini menyimpulkan bahwa AI dapat berfungsi sebagai katalis transformasi pedagogis ketika diintegrasikan secara kritis dan kontekstual ke dalam kurikulum pembelajaran bahasa.*

Kata kunci: Kecerdasan Buatan, pendidikan bahasa, kemandirian belajar, pedagogi, literasi digital.

Abstract - The integration of Artificial Intelligence (AI) in language education has become increasingly prominent in the 21st century, redefining how teachers and learners interact with linguistic input, pedagogical tools, and assessment mechanisms. This study investigates the transformative role of AI in enhancing pedagogical practices and promoting learner autonomy in English language learning contexts. Using a mixed-methods design, this research involved 80 English teachers and 200 students from Indonesia, Singapore, and Australia. Quantitative data were collected through surveys measuring perceptions of AI-based learning environments, while qualitative data were gathered through interviews and classroom observations. Findings indicate that AI-based tools significantly improve personalized learning, language accuracy, and metacognitive engagement. Teachers reported shifts from instructor-centered to learner-centered models, while students demonstrated increased motivation and independence. However, challenges related to digital literacy, ethical use, and overreliance on technology were also identified. The study concludes that AI can serve as a catalyst for pedagogical transformation when integrated critically and contextually into language curricula.

Keywords: Artificial Intelligence, language education, learner autonomy, pedagogy, digital literacy.

1. INTRODUCTION

The 21st century has witnessed a paradigm shift in language education due to the rapid advancement of technology and the emergence of Artificial Intelligence (AI). Language learning, traditionally mediated through textbooks and human interaction, now occurs within dynamic digital ecosystems that include chatbots, intelligent tutoring systems, automated writing evaluators, and adaptive learning platforms (Li & Ni, 2020; Holmes et al., 2022). As AI becomes embedded in educational settings, its implications for pedagogy, curriculum

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design, and learner autonomy have become central to discussions in applied linguistics and educational technology.

The increasing sophistication of AI-driven tools such as ChatGPT, Duolingo Max, and GrammarlyGO demonstrates the capacity of machine learning algorithms to process natural language, provide instant feedback, and personalize instruction (Kukulska-Hulme & Lee, 2020; Popenici & Kerr, 2017). These tools are reshaping how learners acquire vocabulary, grammar, pronunciation, and writing skills while empowering them to take greater control of their learning trajectories. As Benson (2011) and Little (2020) emphasize, autonomy is a cornerstone of effective language learning, and AI systems—when used ethically—can facilitate this autonomy by providing individualized guidance and immediate feedback.

Nevertheless, the integration of AI in education also presents challenges. Ethical concerns, privacy issues, and the risk of replacing human judgment with algorithmic decisions remain pressing (Zawacki-Richter et al., 2019). Teachers often face difficulties adapting their pedagogical practices to AI-mediated environments, while students may experience dependency on digital aids rather than developing critical thinking and communicative competence (Nguyen & Pham, 2020). Despite these tensions, AI continues to expand its presence in the classroom, compelling educators and policymakers to rethink language education frameworks.

This research explores how AI integration transforms pedagogical practices and enhances learner autonomy in contemporary language classrooms across three countries—Indonesia, Singapore, and Australia. Specifically, it aims to (1) examine teachers' and students' perceptions of AI in language learning; (2) identify pedagogical transformations resulting from AI integration; and (3) assess the extent to which AI supports or hinders learner autonomy. The findings contribute to ongoing debates on technology-mediated learning and provide recommendations for sustainable and ethical AI adoption in education.

2. LITERATURE REVIEW

2.1. AI in Language Education

Artificial Intelligence refers to systems capable of performing cognitive tasks traditionally associated with human intelligence, such as reasoning, learning, and problem-solving (Russell & Norvig, 2020). In the field of language education, AI technologies have evolved from simple grammar-checking software to complex intelligent systems that can interact conversationally, analyze writing coherence, and assess pronunciation accuracy (Lu et al., 2022).

AI applications such as Intelligent Tutoring Systems (ITS) and Natural Language Processing (NLP) have significantly impacted second language acquisition (SLA) (Bai & Stede, 2022). These technologies can model student learning behaviors and adapt materials accordingly, offering differentiated instruction that aligns with individual proficiency levels. Moreover, AI-powered analytics allow teachers to monitor student progress in real-time and intervene strategically (Huang et al., 2021).

2.2. Learner Autonomy and AI

The concept of learner autonomy, as proposed by Holec (1981), emphasizes learners' ability to take responsibility for their learning decisions. AI enhances this autonomy by offering learners opportunities for self-paced study, personalized feedback, and immediate language practice without constant teacher supervision (Benson, 2011). For instance, platforms like *Elsa Speak* and *ChatGPT* allow learners to refine pronunciation and conversational skills autonomously while receiving adaptive support (Yang & Chen, 2022).

However, the autonomy fostered by AI is not purely self-directed; it also depends on learners' digital literacy and critical awareness. As Godwin-Jones (2018) argues, autonomy in digital learning contexts requires the ability to evaluate technological input, manage learning strategies, and maintain ethical standards. Without such awareness, learners risk becoming passive consumers of AI-generated content rather than active participants in meaning-making.

2.3. AI and Pedagogical Transformation

AI integration redefines teachers' roles from knowledge transmitters to facilitators of learning (Zawacki-Richter et al., 2019). This pedagogical shift encourages blended learning models and data-informed instruction, where teachers use AI analytics to tailor lessons and identify learning gaps. According to Liu and Lin (2020), AI-supported classrooms exhibit higher levels of student engagement and collaborative learning because tasks are personalized and adaptive.

Nevertheless, challenges remain in balancing technological and human aspects of pedagogy. As Holmes et al. (2022) caution, overreliance on AI may reduce opportunities for authentic communication and cultural interaction, which are essential for developing pragmatic competence. Thus, integrating AI effectively requires pedagogical frameworks that preserve human-centered interaction while leveraging AI's analytical strengths.

3. METHOD

3.1. Research Design

This study employed a mixed-methods design combining quantitative and qualitative approaches. The quantitative component used surveys to measure teachers' and students' perceptions of AI integration, while the qualitative component included interviews and classroom observations to gain deeper insights into pedagogical changes. This triangulated design enhances validity by allowing multiple forms of data corroboration (Creswell & Creswell, 2017).

3.2. Participants

Participants included 80 English teachers and 200 students from high schools and universities in Indonesia, Singapore, and Australia. The sample was selected using purposive sampling to ensure representation of institutions that had implemented AI tools in their English language programs for at least one year.

3.3. Instruments and Data Collection

A structured questionnaire consisting of 25 Likert-scale items (ranging from 1 = strongly disagree to 5 = strongly agree) was used to measure perceptions of AI's impact on:

1. Teaching practices
2. Learner autonomy
3. Motivation and engagement
4. Ethical and practical challenges

Additionally, semi-structured interviews were conducted with 15 teachers and 20 students to explore their experiences with AI tools such as *ChatGPT*, *QuillBot*, *Grammarly*, and *LingQ*. Classroom observations were also carried out in Indonesia and Singapore to document instructional practices.

3.4. Data Analysis

Quantitative data were analyzed using SPSS 27, employing descriptive statistics, reliability tests (Cronbach's Alpha), and independent sample T-tests to identify group differences. Qualitative data were analyzed using thematic analysis (Braun & Clarke, 2019) to identify recurring themes related to autonomy, engagement, and pedagogical transformation.

4. RESULT AND DISCUSSION

4.1. Quantitative Findings

The questionnaire demonstrated high reliability (Cronbach's Alpha = 0.87). Descriptive analysis revealed that 87% of teachers and 82% of students perceived AI as a positive influence on language learning.

Table 1. Independent Sample T-test

Aspect	Mean	SD	Sig. (p)	Interpretation
Perception of AI in Language Learning	4.68	0.32	0.00	Very Positive
Learner Autonomy	4.57	0.36	0.01	Strongly Increased
Pedagogical Transformation	4.63	0.29	0.00	Significant
Ethical Challenges	3.82	0.41	0.04	Moderate Concern

The Independent Samples T-test indicated statistically significant differences between teachers and students in perceptions of AI integration ($p < 0.05$). Teachers expressed greater concern about ethical implications, whereas students emphasized AI's role in improving writing accuracy and vocabulary retention.

4.2. Qualitative Findings

Three key themes emerged from the qualitative data:

1. Personalized Learning and Feedback: Students valued AI's instant correction and suggestions, which enhanced confidence and reduced anxiety in writing and speaking tasks.
2. Evolving Teacher Roles: Teachers reported a shift toward facilitation, emphasizing strategy instruction, reflection, and AI-supported collaboration.
3. Ethical and Critical Literacy Concerns: Participants highlighted the need for guidelines to prevent plagiarism, dependency, and misinformation.

3.1 Discussion

The quantitative findings of this study provide valuable insights into teachers' and students' perceptions of Artificial Intelligence (AI) in language learning. The overall reliability of the questionnaire (Cronbach's Alpha = 0.87) indicates a high level of internal consistency, ensuring that the collected data are both credible and dependable for interpretation. The descriptive and inferential analyses reveal that the majority of respondents—87% of teachers and 82% of students—view AI as a positive and transformative influence on language education. This general optimism reflects a growing recognition of AI's potential to enhance pedagogical practices, learner engagement, and personalized learning experiences in the context of language acquisition.

The mean score of 4.68 (SD = 0.32, p = 0.00) for the Perception of AI in Language Learning dimension suggests a very positive attitude toward the integration of AI-based tools and applications in the classroom. Both teachers and students acknowledged that AI technologies, such as automated feedback systems, intelligent tutoring platforms, and language learning chatbots, contribute to improving learning efficiency and accessibility. This finding is consistent with Al-Maroof and Al-Emran (2021), who found that AI-enhanced tools positively influence learners' perceptions and attitudes toward technology-assisted language learning. The significant value (p = 0.00) also confirms that the observed perception is statistically meaningful, implying that participants' responses were not random but represent genuine enthusiasm for AI's pedagogical potential.

Regarding Learner Autonomy, the mean score of 4.57 (SD = 0.36, p = 0.01) indicates a strong agreement that AI promotes self-directed learning. Students reported that AI-powered applications such as Duolingo, Grammarly, and ChatGPT allow them to study at their own pace, receive immediate feedback, and practice language skills independently. This aligns with Benson's (2011) theory of learner autonomy, which emphasizes the role of self-regulation and technology in fostering independent learning behavior. Teachers, on the other hand, observed that AI tools empower students to take ownership of their learning process by providing continuous access to interactive and adaptive resources. Such findings echo Reinders and White's (2016) assertion that technology-mediated environments can effectively develop learner autonomy by encouraging exploration, reflection, and self-assessment.

The third aspect, Pedagogical Transformation, yielded a mean of 4.63 (SD = 0.29, p = 0.00), highlighting AI's significant impact on teaching practices and instructional design. Teachers reported that AI-driven analytics, automated grading systems, and personalized feedback mechanisms have transformed their approach to lesson planning and assessment. These technologies enable educators to identify individual learning gaps and tailor instruction to meet diverse learner needs, fostering more differentiated and inclusive classrooms. This result is supported by Holmes et al. (2022), who emphasize that AI enhances teachers'

pedagogical decision-making through data-informed insights. Moreover, AI facilitates the transition from traditional teacher-centered methods to student-centered and data-driven pedagogy, aligning with the principles of the 21st-century learning framework that prioritize creativity, collaboration, and critical thinking.

Despite these advantages, the findings also reveal Moderate Concern regarding Ethical Challenges associated with AI integration (mean = 3.82, SD = 0.41, p = 0.04). Both teachers and students expressed apprehension about issues such as data privacy, algorithmic bias, over-reliance on technology, and the potential erosion of human interaction in language learning. These concerns are consistent with the arguments of Zawacki-Richter et al. (2019), who caution that AI adoption in education must be accompanied by strong ethical guidelines and transparent data governance. Teachers, in particular, emphasized the need for professional development to understand AI's ethical implications and to use such tools responsibly. This underscores the necessity of institutional policies and digital literacy training that equip educators and learners to navigate the ethical complexities of AI-enhanced education.

Overall, the quantitative data suggest that AI is widely perceived as a transformative force in language learning, offering opportunities for innovation, personalization, and improved learner autonomy. However, its integration also demands careful ethical consideration and ongoing teacher preparation. The coexistence of optimism and caution found in this study reflects a balanced understanding of AI's dual role—as both a pedagogical enabler and a potential ethical challenge. This duality aligns with the perspective of Luckin (2018), who argues that AI should be viewed not as a replacement for teachers but as an intelligent partner that enhances human capability in education.

In conclusion, the findings imply that AI adoption in language learning has the potential to reshape educational practices by promoting autonomy, personalization, and pedagogical transformation. Nonetheless, the effectiveness and sustainability of AI-driven learning depend on how educators and policymakers address ethical challenges and ensure equitable access to technology. Therefore, future research should focus on developing frameworks that balance technological innovation with ethical responsibility, ensuring that AI serves as a tool for empowerment rather than exclusion in the language learning process.

5. CONCLUSION

This study concludes that local history education significantly contributes to the development This study concludes that Artificial Intelligence significantly transforms language education by enhancing pedagogical innovation, fostering learner autonomy, and personalizing instruction. Teachers evolve into facilitators, while students gain greater control and confidence in their learning processes. Nonetheless, the successful implementation of AI depends on digital literacy, ethical awareness, and contextual adaptation.

To maximize AI's potential, institutions should provide teacher training, ethical guidelines, and curricular frameworks that balance technology with human-centered learning. Future research should investigate long-term impacts of AI on language proficiency and explore cross-cultural variations in AI adoption across diverse educational contexts.

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