

A SYSTEMATIC LITERATURE REVIEW ON THE USE OF ARTIFICIAL INTELLIGENCE IN ENGLISH LANGUAGE TEACHING FOR INDONESIAN SENIOR HIGH SCHOOL STUDENTS

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Abstract

Artificial Intelligence (AI) is transforming English Language Teaching (ELT) in Indonesia, particularly in Senior High Schools (SMA), by addressing challenges such as low student motivation and limited resources, especially post-pandemic. This research aims to examine the use of AI in ELT for Indonesian high school students from 2020 to 2025, identifying trends, benefits, challenges, and impacts of AI integration. This study adopted a qualitative Systematic Literature Review (SLR) approach. An initial comprehensive search on Google Scholar yielded 3665 documents, with 14 articles selected for analysis after rigorous screening. Findings indicate a significant increase in publications since 2022, with Natural Language Processing (NLP) being the most common AI technology, primarily enhancing speaking and writing skills. Key benefits include personalized learning, increased student engagement, improved communicative skills, and reduced teacher workload. However, challenges such as inadequate infrastructure, varying teacher competency, cultural sensitivity, high costs, and ethical concerns regarding data privacy remain. The study concludes that while AI has transformative potential in enhancing ELT effectiveness and accessibility, successful implementation requires addressing these challenges through strategic investment in infrastructure, teacher training, and ethical frameworks.

Keywords: Artificial Intelligence, Educational Challenges, English Language Teaching, Senior High School, Systematic Literature Review.

1 INTRODUCTION

Artificial Intelligence (AI) has emerged as a transformative force across various sectors of life, impacting individuals from smart device applications to manufacturing, transportation, healthcare, and other fields (Sindermann et al., 2021). AI technology is rapidly progressing, and its influence on the field of education is also gaining momentum, not least in English Language Teaching (ELT). AI, as a computer system that simulates human intelligence, has led to the dominance of mobile devices that can be utilized by educators and learners, owing to their ease of use and popularity, offering flexibility in terms of time and place (Rosyid & Hidayati, 2020). Language learning supported by smart devices possesses characteristics such as mobility, efficiency, universality, interaction, sharing, and individuality. The emergence of mobile devices and AI-based mobile learning has spurred rapid innovation in personalized learning, enabling students to practice language with the help of apps tailored to their actual needs (Luo & Cheng, 2020).

Generally, AI can facilitate learning by providing personalized learning contexts, which expedites students' independent learning (Liang et al., 2021). It enables students to study at their convenience, receive feedback, and be assisted and guided in their learning with minimal intervention from the teacher. AI can make students more relaxed when talking to a machine, repeat tasks endlessly, practice language skills; it can provide learning experiences tailored to students' individual needs, offer revise suggestions, and record students' progress. For educators, AI "provides a new platform for the creation of an

intelligent and personalized English teaching environment.” The integration of technology in education has been a transformative force in the 21st century, reshaping how knowledge is imparted and acquired. The rapid development of digital technologies has led to the emergence of innovative educational tools that enhance learning experiences. Among these technologies, Artificial Intelligence (AI) stands out as a particularly influential force, encompassing a range of technologies, including machine learning, natural language processing, and data analytics, which can be harnessed to create personalized and adaptive learning environments.

In Indonesia, English language teaching is a vital component of the national education curriculum, particularly at the Senior High School (SMA) level. English is recognized as a global lingua franca, essential for academic success and future employment opportunities. However, the teaching and learning of English in Indonesia face numerous challenges that hinder effective language acquisition (Setiawati, 2024). The English language learning outcomes at the high school level emphasize proficiency in listening, speaking, reading, and writing skills. Students are expected to understand and use English in both academic and social contexts while developing critical and creative thinking abilities. Nevertheless, the reality of English language teaching and learning at the high school level in Indonesia remains low, at least based on reports from several previous studies (Jon et al., 2021). One of the primary challenges is low student motivation. Many students perceive English as a difficult subject, leading to disengagement and a lack of enthusiasm for learning. Traditional teaching methods, which often rely on rote memorization and grammar drills, do not resonate with the interests and learning styles of contemporary students (Setyaningsih & Nurjanah, 2025).

Furthermore, the lack of adequate facilities and resources in many schools exacerbates the situation. Many classrooms are ill-equipped with technology, limiting opportunities for interactive and engaging language learning experiences (Wibowo et al., 2023). Moreover, the reliance on traditional teaching approaches often results in a one-size-fits-all model that fails to address the diverse needs of learners. Students come from various backgrounds and possess different levels of English proficiency, yet the teaching methods employed do not accommodate these differences. This lack of personalization can lead to frustration and a sense of inadequacy among students, further diminishing their motivation to learn.

The integration of technological innovations, particularly AI, presents a promising solution to these challenges. AI can facilitate personalized learning experiences that cater to individual student needs, helping to improve engagement and motivation (Dimitriadou & Lanitis, 2023). For instance, AI-driven language learning applications can provide tailored exercises and feedback based on a student's performance, allowing them to progress at their own pace. By incorporating AI into English language teaching, educators in Indonesia can create more dynamic and effective learning environments that foster student success.

Despite the potential benefits of AI in English language teaching, several persistent issues hinder its effective implementation in Indonesia. One of the most pressing concerns is the overall level of English proficiency in the country. According to the EF English Proficiency Index, Indonesia consistently ranks lower in English proficiency compared to other countries in Southeast Asia. This low proficiency level is indicative of systemic issues within the education system, including inadequate teacher training, limited access to resources, and a lack of emphasis on communicative language teaching (Education First, 2023).

Teachers in Indonesia often face significant limitations in their ability to utilize modern technology for teaching. Many educators lack the necessary training and support to effectively integrate AI tools into their classrooms. This gap in knowledge and skills can lead to resistance to adopting new technologies, as teachers may feel overwhelmed or uncertain about how to incorporate AI into their teaching practices (Hidayati & Supriyadi, 2021). Additionally, the lack of access to reliable internet and technological resources in many schools further complicates the situation, making it challenging for teachers to implement AI-driven solutions.

Furthermore, the lack of resources for personalizing student learning is a critical issue. Artificial Intelligence Center Indonesia states that many schools do not have the financial means to invest in advanced educational technologies, leaving students without the support they need to thrive. This lack of resources can result in a disparity in learning opportunities, where only a select few students benefit from technology-enhanced learning experiences (Artificial Intelligence Center Indonesia, 2022). Consequently, the potential of AI to address these challenges remains largely untapped, as many educators are unable to leverage its capabilities effectively. The existing problems in English language teaching in Indonesia highlight the urgent need for innovative solutions. AI has the potential to provide personalized learning experiences, adaptive feedback, and targeted interventions that can help address the challenges faced by both students and teachers (Rahman & Sari, 2023). However, for AI to be effectively utilized in Indonesian classrooms, it is essential to provide educators with the necessary training, resources, and support to integrate these technologies into their teaching practices.

Given the transformative potential of AI, it is essential to examine not only its applications but also the broader implications for the education system. The significance of this research extends beyond academic inquiry; it holds practical implications for various stakeholders in the Indonesian education system. Academically, this study contributes to the growing body of literature on the use of AI in education, particularly in the context of English language teaching and learning. By exploring the applications, benefits, and challenges of AI in English teaching, this research aims to fill a critical gap in the existing literature, providing insights that can inform future studies and educational practices.

Practically, the findings of this research can offer valuable guidance for teachers, students, and education policymakers in Indonesia. For educators, understanding how to effectively integrate AI into their teaching practices can enhance their instructional strategies and improve student outcomes. By providing insights into the effectiveness of AI tools, this research can help teachers make informed decisions about which technologies to adopt and how to implement them in their classrooms. For students, the research can highlight the potential benefits of using AI in language learning, encouraging them to engage with technology-enhanced learning experiences. By understanding how AI can support their language acquisition, students may be more motivated to utilize these tools to improve their English proficiency. Additionally, education policymakers can benefit from the findings by gaining insights into the importance of investing in AI technologies and training programs for teachers. This research can serve as a foundation for developing policies that promote the integration of AI in English language teaching, ultimately enhancing the quality of education in Indonesia.

Based on the issues, discussions, and hopes previously mentioned regarding the use of Artificial Intelligence in English Language Teaching (ELT) at the high school level in Indonesia, this research aims to answer the following questions:

1. What is the overall state of current research on AI integration in English language teaching for senior high schools in Indonesia from 2020-2025?
2. What are the challenges and benefits identified in optimizing AI tools and applications to improve English teaching and learning outcomes among senior high school students in Indonesia?
3. What are the impacts of integrating Artificial Intelligence on English Language Teaching for Senior High School in Indonesia from 2020-2025?

2 RESEARCH METHODS

This study adopted a qualitative Systematic Literature Review (SLR) approach, which is a methodological approach used to identify, select, and critically appraise existing research on a specific topic in a systematic and transparent manner (Cabrera et al., 2023). In this study, the SLR aims to explore how AI is being utilized in English language teaching for Senior High School students in Indonesia from, with the goal of identifying trends,

challenges, and opportunities in this domain. The articles that were used as the basis for the researcher's analysis are those published between 2020 and 2025, which have met the established inclusion and exclusion criteria. The primary database of articles to be targeted in this research is Google Scholar.

2.1. Literature Search Strategy

The data collection process followed a systematic protocol, beginning with a keyword search using Boolean operators (AND, OR, NOT) to construct search strings combining relevant keywords. This was followed by database exploration to gather a wide spectrum of studies. The search employed specific keywords related to the research topic, such as "Artificial Intelligence in English Language Teaching," "AI in ESL/EFL classrooms," "AI-assisted language learning in Indonesia," and "Technology in teaching English high school" "Artificial Intelligence," "AI", "Kecerdasaan Buatan" "ELT" "English Language Teaching," "Pengajaran Bahasa Inggris" "Senior High School," "SMA", and "Sekolah Menengah Atas." These keywords are combined using Boolean operators (AND, OR, NOT) to refine the search results and ensure that the most relevant studies were identified. Boolean operators (AND, OR, NOT) were applied to refine the search results and ensure that the most relevant studies were identified.

2.2. Inclusion and Exclusion Criteria

To ensure that only relevant studies meeting specific criteria were included in the analysis, a set of inclusion and exclusion criteria was established (Kitchenham & Charters, 2008). Inclusion Criteria:

Tabel 1. Inclusion and Extaction Criteria

Inclusion	Exclusion
Should focus on Artificial Intelligence technologies that related to ELT	Not use a vigorous methodology or written in an ambiguous way.
Be mainly about ELT.	Outside the study scope.
Written in English and Indonesia	Non-English and Indonesia articles.
Be in a peer-reviewed journal or peer-reviewed conference proceedings.	Non-journal articles or non-conference proceedings.
Must be published between 2020 and June 2025	Not published between February 2020 and June 2025.
Qualitative, Quantitative, Mix Method research	Non qualitative, quantitative, mix-method
Focus on Indonesian Senior High School	Non-Indonesian Senior High School
AI technology for Education	AI Technology non-education
Original Articles	Non original articles

2.3. Article Selection Process

The article selection process began with an initial search on Google Scholar using the Publish or Perish application, which yielded a total of 3665 documents. Following the initial search, the next step involved removing duplicate records that appeared across multiple databases using Covidence. A total of 1185 duplicate articles were removed.

Subsequently, independent researchers reviewed the titles and abstracts of all remaining documents (2480 articles) to determine whether they met the inclusion criteria. Microsoft Excel was used to organize and track the screened literature efficiently. This title and abstract screening process reduced the number of articles to 500.

Afterward, a full-text evaluation was conducted for the remaining 239 articles. All articles that passed the title and abstract screening were read in full by the researcher. Each article was assessed against the predefined inclusion criteria and evaluated for methodological quality and relevance to the research topic. Articles were excluded if they failed to provide sufficient detail about the AI technology used, did not clearly describe the impact on English language learning outcomes, or did not involve senior high school

students. The final outcome of this stage was a set of 14 articles that fully satisfied all inclusion criteria and were deemed suitable for detailed data extraction and thematic analysis.

2.4. Data Extraction

The information recorded from the 14 selected articles was classified into eight categories: article title, adopted technology, research methods, journal name, publication year and language, grade level, language skills, and the effect of the systems used on ELT.

2.5 Data Synthesis

The data obtained from the relevant literature were analyzed using a narrative approach. This involved identifying key themes, patterns, and relationships among the different studies. The synthesis process allowed for a comprehensive understanding of the findings and facilitated the drawing of conclusions based on the collective evidence. Quantitative data from relevant studies were processed using descriptive methods to illustrate reported trends or impacts. This quantitative analysis complemented the qualitative insights gained from the narrative synthesis, providing a well-rounded view of the research landscape.

3 RESULT AND DISCUSSION

3.1 The Result

This systematic review analyzed 14 articles relevant to the application of Artificial Intelligence (AI) in English Language Teaching (ELT) for Senior High School (SMA) students in Indonesia, published between 2020 and 2025. The key findings are categorized as follows:

3.1.1 Adoption of Technology Based on Types of AI

The analysis of the 14 selected articles revealed a focused adoption of AI technologies in English Language Teaching (ELT) for Indonesian Senior High School students. Natural Language Processing (NLP) was the most common technology, discussed in 5 articles, emphasizing its role in language understanding and generation.

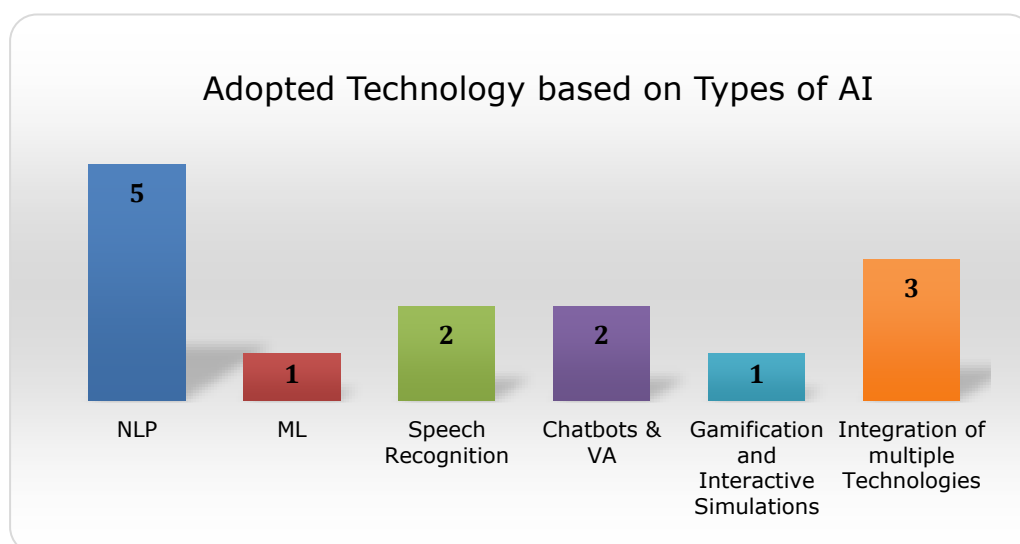


Figure 1. Adopted Technology based on Types of AI

Speech Recognition and Chatbots & Virtual Assistants each appeared in 2 articles, highlighting their use in oral communication. Machine Learning, Gamification, and Interactive Simulations were noted in 1 article each. Notably, 3 articles integrated multiple

technologies, indicating a trend towards comprehensive AI systems that address complex learning needs.

3.1.2 Research Method Implemented

The reviewed articles predominantly employed quantitative research designs, with 9 out of 14 articles utilizing this method. This indicates a strong focus on measuring the effectiveness of AI interventions through empirical data. Qualitative methods were used in 3 articles, providing in-depth insights into experiences and perceptions related to AI in ELT. Additionally, 2 articles adopted a mixed-methods approach, combining both quantitative and qualitative elements for a comprehensive understanding of AI's role in ELT.

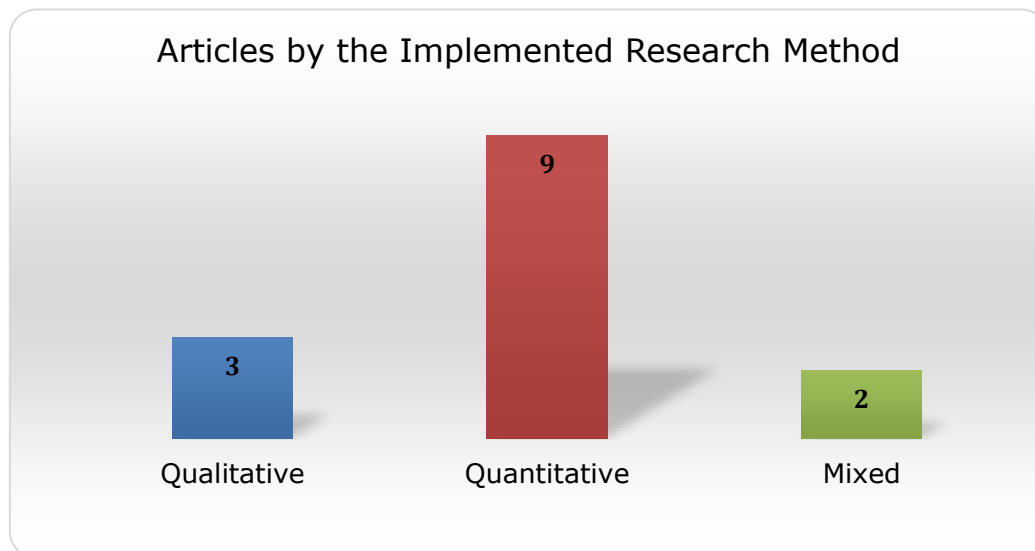


Figure 2. Distribution of Articles by the Implemented Research Method

3.1.3 Publication Year Trend

Analysis of publication years shows a significant increase in research activity regarding AI in ELT for Indonesian Senior High School students. No articles were published in 2020 and 2021, but publications began to rise in 2022, with 1 article, followed by 5 articles in both 2023 and 2024, and 3 articles already identified for 2025. This trend reflects growing academic interest and practical implementation of AI in ELT, likely influenced by increased digital adoption post-pandemic.

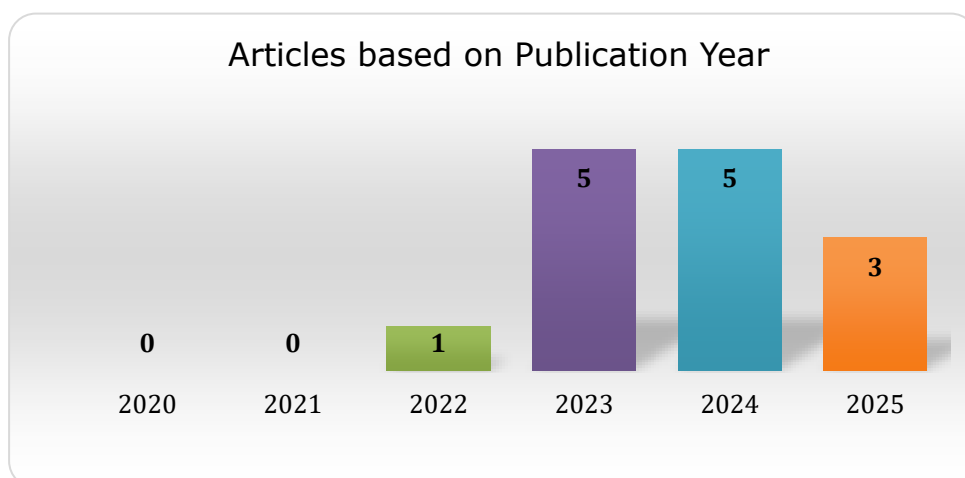


Figure 3. Distribution of Articles based on Publication Year

3.1.4 Language of Articles

Most reviewed articles were published in English, with 13 out of 14 articles in English and only 1 in Indonesian. This suggests that research on AI in ELT is largely disseminated through international platforms, indicating engagement with global research communities. There is potential for growth in local language publications to enhance accessibility for Indonesian practitioners.

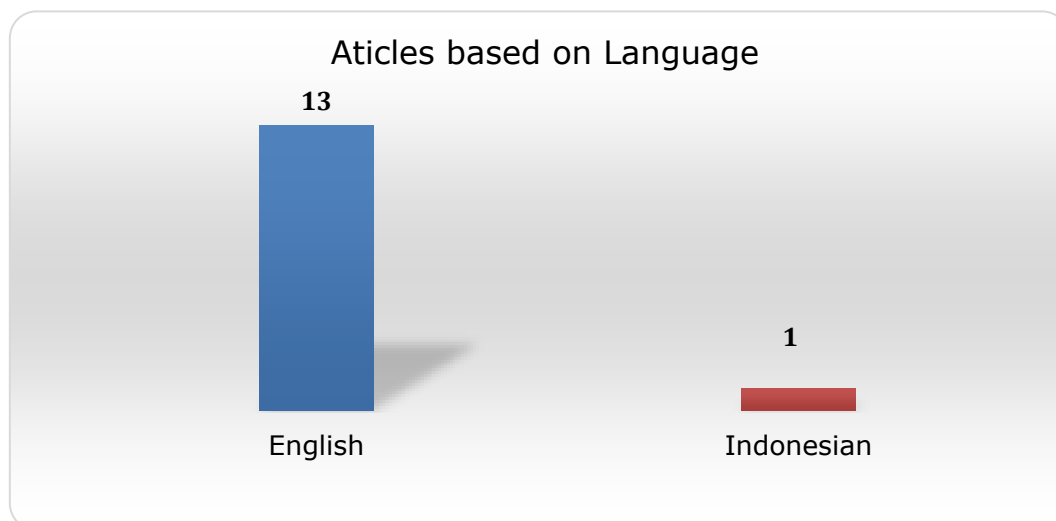


Figure 4. Distribution of Articles based on Language

3.1.5 Grade Levels

The distribution of articles across grade levels shows a focus on Grade X (3 articles) and Grade XI (4 articles), with only 1 article addressing Grade XII. Seven articles adopted an integrated approach, involving multiple grade levels, indicating AI's applicability across the senior high school curriculum.

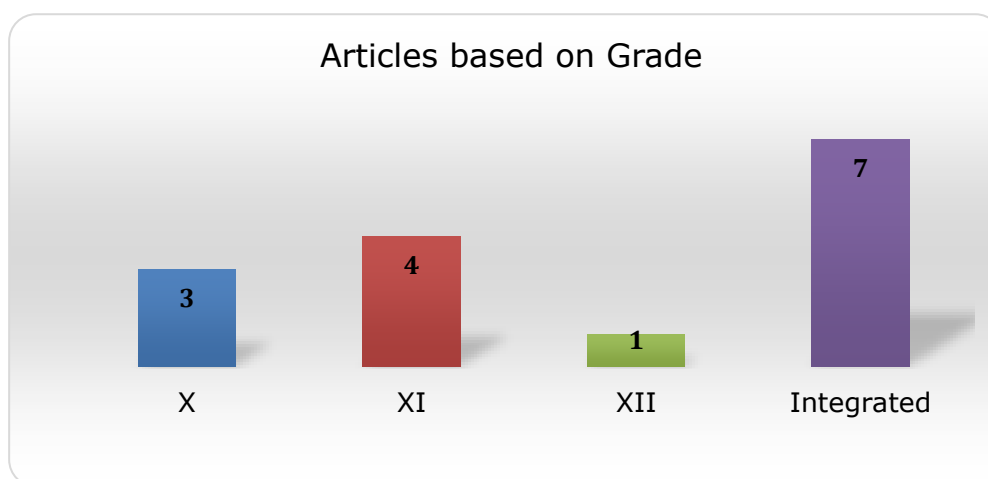


Figure 5. Distribution of Articles based on Grade

3.1.6 Language Skills

The analysis of targeted language skills reveals a strong emphasis on productive skills, with speaking addressed in 6 articles and writing in 5 articles. Receptive skills received less attention, with vocabulary and pronunciation each covered in 1 article.

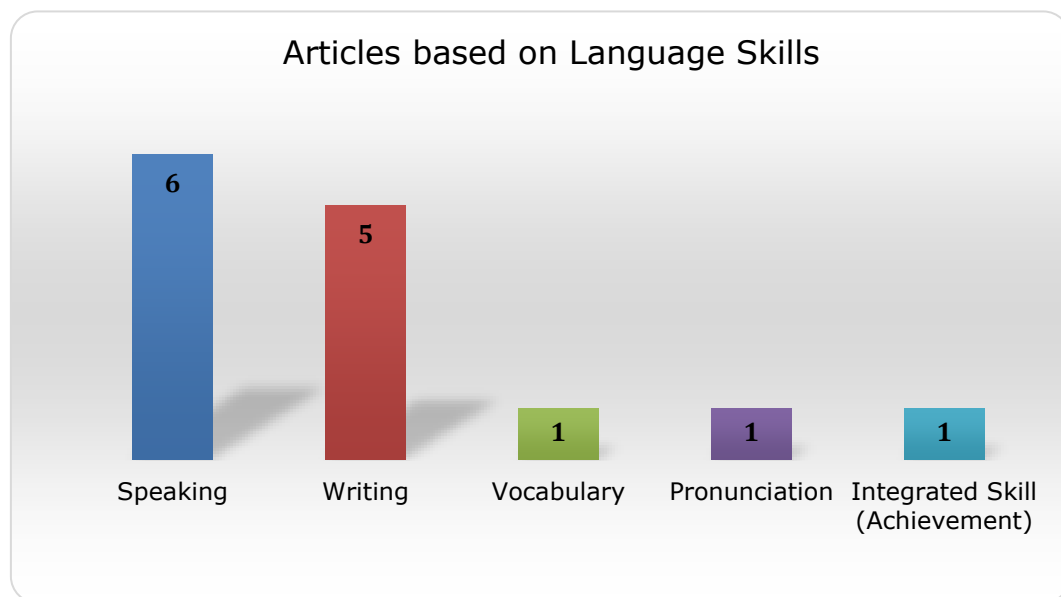


Figure 6. Distribution of Articles based on Language Skills

This distribution highlights a current research priority on enhancing active language production, while other important aspects of language learning may need further exploration.

3.2 Discussion

The current landscape of research on AI integration in English Language Teaching (ELT) for Indonesian Senior High Schools, as highlighted by the analysis of 14 articles, appears to be an emerging and rapidly growing area, though it starts from a relatively low point. A notable observation is the dramatic increase in publications starting in 2022, with no articles published in 2020-2021, just one in 2022, followed by five in both 2023 and 2024, and three until June 2025. This rapid growth, especially in the latter part of the review period, is not just a random occurrence but rather a strong indication of increasing academic and practical interest in utilizing AI in this educational setting. This trend is likely influenced by the global shift towards digital transformation in education, which was significantly accelerated by the widespread move to online learning during the COVID-19 pandemic. However, it is important to approach the findings with caution. While the increase in publications suggests a growing interest, it does not necessarily imply that the use of AI in Indonesia is developing at a rapid pace. Further research is needed to draw more definitive conclusions about the actual implementation and effectiveness of AI in this context.

The forced pivot to remote learning environments compelled educators and institutions to explore and adopt technological solutions more actively, including AI, to maintain educational continuity and quality (Fanani, et.al., 2024). This trend aligns with global observations of increased technology adoption in education post-pandemic. The increasing number of studies thus signifies a growing recognition among Indonesian researchers and educators of AI's potential to address long-standing challenges in ELT, such as limited resources, large class sizes, and teacher competency gaps, by offering scalable and personalized learning solutions.

In terms of technological focus, Natural Language Processing (NLP) stands out as the most prominent AI type, being discussed or implemented in 5 articles. This dominance is not coincidental but rather a direct reflection of NLP's inherent capabilities in processing, understanding, and generating human language, making it intrinsically aligned with the core communicative nature of ELT.

Tools like QuillBot AI (Amyatun & Kholis, 2023; Yuliandari et al., 2025) and ChatGPT (Niswa & Daulay, 2024) for writing assistance, and AI-powered chatbots (Gurusinga et al., 2025) for speaking practice, exemplify how NLP facilitates direct interaction with language content, providing immediate and contextualized feedback crucial for skill acquisition. This aligns with constructivist learning theories, where active engagement and immediate feedback are paramount for knowledge construction.

The notable presence of Speech Recognition and Chatbots/Virtual Assistants (each in 2 articles) further underscores the emphasis on developing practical communication skills, particularly oral proficiency. Applications such as Google Assistant (Hadi & Junor, 2022) and ELSA Speak (Gusrianto & Iswahyuni, 2025) for speaking and pronunciation practice, along with Cakap application (Qomariyah et al., 2024) and Smalltalk2me AI (Maulidianti et al., 2024), demonstrate a clear pedagogical drive to overcome the common challenge of limited opportunities for authentic spoken English practice in Indonesian classrooms.

The emergence of Machine Learning (ML) in 1 article points towards the development of adaptive learning models, while Gamification and Interactive Simulations (also in 1 article, specifically the Fondi application by Rambe & Ali Amran, 2024) highlight efforts to enhance learner engagement by leveraging motivational design principles. Crucially, the trend of integrating multiple AI technologies (3 articles) signifies a strategic move towards more holistic and sophisticated AI solutions that combine various AI capabilities to address complex learning needs across different language modalities, reflecting a more mature understanding of AI's potential beyond single-function tools. This multi-modal approach suggests a recognition that comprehensive language learning requires diverse AI functionalities working in concert.

Methodologically, the research landscape is predominantly shaped by quantitative studies (9 articles), indicating a strong emphasis on empirically measuring the effectiveness and impact of AI interventions. This approach is vital for establishing the efficacy of new technologies in education, often through pre-test and post-test designs to show improvements in skills (e.g., Gurusinga et al., 2025; Hadi & Junor, 2022; Maulidianti et al., 2024). While providing robust evidence of "what works" and demonstrating measurable outcomes, this quantitative dominance also suggests a potential limitation in understanding the deeper "how" and "why" behind AI's impact.

The relatively fewer qualitative (3 articles) and mixed-methods (2 articles) studies (e.g., Rambe & Ali Amran, 2024, exploring student engagement with Fondi; Qomariyah et al., 2024, investigating perceptions of the Cakap application) indicate a current gap in exploring the nuanced experiences, perceptions, and contextual factors influencing AI adoption and implementation from the perspectives of both students and teachers. This imbalance implies that while the field is successfully demonstrating if AI works, there is still much to learn about the intricate processes of its integration, the subjective experiences of its users, and the socio-cultural dynamics at play. A more balanced methodological approach would provide a richer, more holistic understanding of AI's role in ELT.

The majority of the research is published in English (13 articles), signifying active engagement with global academic discourse and contributing to the international body of knowledge on AI in ELT. This is a double-edged sword: while it ensures broader dissemination and peer review within the global scientific community, it also points to a potential challenge in disseminating research findings directly to a broader local audience of practitioners and policymakers who may primarily access information in Bahasa Indonesia.

This highlights a critical need for greater efforts in local language publication and knowledge translation to bridge the gap between research and practice within Indonesia, ensuring that valuable insights reach those who can implement them directly.

Furthermore, the studies cover various class levels (Grade X, XI, XII, and integrated approaches), with a particular emphasis on speaking (6 articles) and writing (5 articles) skills, reflecting the communicative goals of ELT. This focus on productive skills is understandable given the direct applicability of NLP and Speech Recognition, but it also

points to potential areas for future research in receptive skills and other language components.

The integration of AI tools presents significant benefits including personalized learning, enhanced engagement, improved communicative skills, increased accessibility, and reduced teacher workload. The prevalence of NLP and the presence of Machine Learning underscore AI's ability to tailor learning content and provide immediate, individualized feedback, addressing the critical challenge of diverse learner needs in Indonesian schools. AI allows students to learn at their own pace and receive targeted support that traditional methods often cannot provide, thereby fostering a more efficient and effective learning process tailored to individual learning styles and paces (Abusahyon et al., 2023). The inclusion of gamification and interactive simulations (e.g., Fondi application by Rambe & Ali Amran, 2024) and the use of chatbots/VAs (e.g., Cakap application by Qomariyah et al., 2024) are clear indicators of AI's capacity to transform learning into a more dynamic and enjoyable experience. Applications like ELSA Speak (Gusrianto & Iswahyuni, 2025) and Google Assistant (Hadi & Junor, 2022) provide platforms for pronunciation and conversational practice, helping overcome limited authentic English practice opportunities.

However, challenges persist, particularly inadequate technological infrastructure in rural areas and varying teacher digital literacy. Many educators lack training to effectively integrate AI tools, potentially leading to resistance or underutilization (Widiati & Cahyono, 2021). Cultural sensitivity issues emerge as Western-developed AI applications may not align with Indonesian cultural norms (Rebolledo Font de la Vall & Gonzalez Araya, 2023). Cost barriers prevent widespread adoption, while over-reliance concerns highlight the need to balance AI with human interaction. Ethical concerns regarding student data privacy remain significant in Indonesia's evolving digital landscape, as noted by Yuliandari et al. (2025).

The impacts of AI integration are multifaceted, most notably enhancing language proficiency - particularly in speaking and writing. The strong focus on speaking (6 articles) and writing (5 articles), supported by AI tools, indicates measurable improvement in these areas. For instance, the use of the Fondi application significantly improved students' speaking abilities and engagement (Rambe & Ali Amran, 2024), and AI-based chatbots led to higher post-test scores in speaking (Gurusinga et al., 2025). Similarly, QuillBot AI significantly improved writing skills, with average test scores increasing from 53.55 to 78.90 (Amyatun & Kholis, 2023), and ChatGPT enhanced writing proficiency in recount texts (Niswa & Daulay, 2024). AI's capacity for immediate and personalized feedback on pronunciation (e.g., ELSA Speak, Gusrianto & Iswahyuni, 2025) and grammar/composition (e.g., Grammarly, Erisyerico et al., 2024) allows students to identify and correct errors more efficiently. This immediate, non-judgmental feedback loop, often difficult to provide consistently in large traditional classrooms, is a game-changer for rapid skill acquisition and error correction, fostering a growth mindset among learners. The DALL-E AI platform also significantly improved vocabulary acquisition (Fannoni et al., 2023), demonstrating AI's impact beyond just productive skills by leveraging visual learning.

Student engagement increases through gamification, with applications like Cakap reporting higher motivation levels (Qomariyah et al., 2024), and those using Smalltalk2me AI showed increased engagement and activity in speaking (Maulidianti et al., 2024). Personalized learning experiences emerge as AI's core strength, adapting content to individual student needs and pacing. AI-driven language learning tools are designed to provide personalized learning experiences and adapt to individual student needs (Moybeka et al., 2023). This ensures that each student receives instruction tailored to their specific needs and pace, effectively addressing the diverse proficiency levels within a single classroom and moving beyond the limitations of a "one-size-fits-all" pedagogical approach. This fosters a more equitable learning environment where every student can progress optimally.

Independent learning flourishes as tools like Google Assistant enable practice beyond classroom hours. Students became more confident and comfortable speaking English with Google Assistant (Hadi & Junor, 2022), indicating fostered independence. This cultivates

greater autonomy and self-directed learning, empowering students to take ownership of their educational journey and practice at their convenience, which is particularly beneficial for self-conscious learners or those who require additional practice beyond classroom hours. While AI does not replace teachers, it significantly augments their capabilities. AI is shown to assist teachers in creating effective learning environments, helping students improve their understanding and interest in lessons (Ridwal Trisoni et al., 2023). The integration of AI aims to support teachers in delivering personalized instruction and to foster a more dynamic approach to language learning (Fannoni et al., 2023). This allows teachers to shift their focus from rote instruction and repetitive tasks to more complex pedagogical roles, such as facilitating critical thinking, designing collaborative projects, providing deeper, human-centric feedback, and addressing socio-emotional aspects of learning. This leads to increased teaching efficiency and potentially more effective instruction.

Data-driven instruction becomes possible through AI's real-time performance analysis, enabling timely curriculum adjustments. AI platforms can collect and analyze vast amounts of student performance data in real-time. AI systems were employed to analyze student data and provide insights that help improve teaching methods and student engagement (Ridwal Trisoni et al., 2023). This provides teachers with invaluable, granular insights into student progress, common errors, and areas needing intervention, enabling more informed and data-driven instructional decisions and allowing for timely adjustments to teaching strategies and curriculum delivery. This moves education towards a more evidence-based practice.

Most importantly, AI helps bridge educational disparities in Indonesia's vast archipelago. For schools and students in remote or underserved areas, AI tools can provide access to high-quality educational resources that might otherwise be unavailable. This helps to mitigate the impact of limited resources and qualified teachers, contributing significantly to greater educational equity across the nation by democratizing access to effective language learning tools and reducing the learning gap between urban and rural areas. This paradigm shift towards personalized, engaging, and data-driven pedagogical approaches marks a significant advancement in the field of ELT in Indonesia, paving the way for a more effective and inclusive educational future.

4 CONCLUSION

The analysis of the integration of AI in English Language Teaching (ELT) in Senior High Schools in Indonesia reveals that, despite the fact that research in this area is still in its early stages, there has been notable growth in publications since 2022. This reflects an increasing academic and practical interest in leveraging AI to address long-standing challenges in ELT, such as limited resources, large class sizes, and teacher competency gaps. The COVID-19 pandemic has been a major driver in the adoption of educational technology, prompting educators to seek solutions that can maintain the continuity and quality of education.

From the analysis, Natural Language Processing (NLP) emerges as the most dominant AI technology, with a focus on developing practical communication skills, particularly in speaking and writing. While the existing research is predominantly quantitative, demonstrating clear outcomes regarding the effectiveness of AI interventions, there is an urgent need for qualitative and mixed-methods research that can explore user experiences and the socio-cultural dynamics influencing AI adoption.

The implications of these findings suggest that the integration of AI in ELT not only offers benefits such as personalized learning, increased student engagement, and reduced teacher workload but also faces significant challenges, including inadequate technological infrastructure, varying levels of teacher digital literacy, and ethical issues related to data privacy. Therefore, it is essential to develop comprehensive and collaborative strategies involving stakeholders at all levels to address these challenges.

Thus, the integration of AI in ELT in Indonesia has the potential to bridge educational disparities, providing access to high-quality resources for students in remote or underserved areas. This marks a paradigm shift towards more personalized, engaging, and data-driven pedagogical approaches, which can enhance the effectiveness and inclusivity of English language education across the country. Continued research and development in this area will be crucial to fully realize AI's potential in improving English language education in Indonesia.

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6 REFERENCES

- Abusahyon, Alia, et al. (2023). AI-driven Technology and Chatbots as Tools for Enhancing English Language Learning in the Context of Second Language Acquisition: A Review Study. *International Journal of Membrane Science and Technology*, 10, 1210. <http://dx.doi.org/10.15379/ijmst.v10i1.2829>
- Amyatun, R. L., & Kholis, A. (2023). Can Artificial Intelligence (AI) like QuillBot AI Assist Students' Writing Skills? Assisting Learning to Write Texts using AI. *English Language Education Reviews*, pp 109-106. <https://doi.org/10.22515/elereviews.v3i2.7533>
- Artificial Intelligence Center Indonesia. (2022). The state of AI in education in Indonesia: Challenges and opportunities. <https://ai-center.or.id/reports/state-of-ai-education>
- Cabrera et al. (2023) The Steps to Doing a Systems Literature Review (SLR) *Journal of Systems Thinking*. (23) 3, pp 1-28. <http://dx.doi.org/10.54120/jost.pr000019.v1>
- Dimitriadou, E., Lanitis, A. (2023) A critical evaluation, challenges, and future perspectives of using artificial intelligence and emerging technologies in smart classrooms. *Smart Learn. Environ.* 10, 12. Pp 2-20. <https://doi.org/10.1186/s40561-023-00231-3>
- Education First. (2023). *EF English Proficiency Index: 2023 report*. <https://www.ef.com/wwen/epi/>
- Fanani, A., Nurcahyani, D., Najih, A., Bakri, & Zaki, M. (2024). Teachers' perspectives on using AI in teaching English at high schools in Jombang. *Contemporary Journal of Applied Sciences*, 2(11), 829-840. <https://doi.org/10.55927/cjas.v2i11.12860>
- Fannoni, A., Priyana, J., Hidayatulloh, M. A., & Adhani, M. (2023). The Use of DALL-E AI Platform to Improve Students' Vocabulary Acquisition at Senior High School. *Journal of English Language Teaching and Learning (JELTL)*, 4(2), pp 117-124. <https://doi.org/10.29408/veles.v7i3.19806>
- Gurusinga, R., Ginting, S., & Bukit, S. (2025). Penerapan Artificial Intelligence dalam Meningkatkan Keterampilan Berbicara Bahasa Inggris Mahasiswa melalui Chatbot Interaktif di SMA Negeri 1 Deli Tua. *Journal of English Language Teaching and Learning (JELTL)*, 6(1), 11-20. <https://doi.org/10.36656/jpmph.v5i2.2265>
- Gusrianto, Enstalanza & Iswahyuni. (2025). Exploring Learning Experience with ELSA Speak for Independent Learning: A Case Study. *Proceedings of the International Conference on Advances in Humanities, Education and Language (ICEL 2024)*: Atlantis Press. Pp. 219-229. https://doi.org/10.2991/978-2-38476-388-7_20

- Hadi, Muhamad & Junor, Raisya. (2022). Speaking to Devices: Can we Use Google Assistant to Foster Students' Speaking Skills? *Journal of Languages and Language Teaching*. Vol.10. No. 4 Pp. 570-578. <http://doi.org.10.33394/joltt.v10i4.5808>.
- Hidayati, N., & Supriyadi, S. (2021). The challenges of English teachers in integrating technology in the classroom: A case study in Indonesia. *International Journal of Instruction*, 14(1), 1-16. <https://doi.org/10.29333/iji.2021.1411a>
- Jon, Roi & Embong, Rahimah & Purnama, Bambang & Wadi, Ari. (2021). The Challenges of English Language Teaching in Indonesia. *International Journal of English and Applied Linguistics (IJEAL)*. 1. 158-168. [10.47709/ijeal.v1i3.1157](https://doi.org/10.47709/ijeal.v1i3.1157)
- Khairunniswita, & Daulay, Sholihatul. (2024). Analyzing the Effectiveness of ChatGPT to Improve Student Writing Proficiency in Recount Texts. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*. 12. 1780-1787. <http://doi.org/10.24256/ideas.v12i2.5646>.
- Kitchenham, B., & Charters, S. (2008). Guidelines for performing systematic literature reviews in software engineering. *Engineering, UK: Department of Computer Science University of Durham*, pp 7-15. <http://dx.doi.org/10.1016/j.infsof.2008.09.009>
- Liang, J.-C., Hwang, G.-J., Chen, M.-R. A., & Darmawansah, D. (2023). Roles and research foci of artificial intelligence in language education: An integrated bibliographic analysis and systematic review approach. *Interactive Learning Environments*, 31(7), pp. 4270-4296. <http://dx.doi.org/10.1080/10494820.2021.1958348>
- Luo, M., & Cheng, L. (2020, July). Exploration of interactive foreign language teaching mode based on artificial intelligence. In *2020 International Conference on Computer Vision, Image and Deep Learning*, pp. 285-290, Chong- qing, China: IEEE. <https://doi.org/10.1109/CVIDL51233.2020.00-84>
- Maulidianti, I., Berliana, N., & Yuliana, Y. G. S. (2024). The Effectiveness of Using Smalltalk2me AI in Teaching Speaking Skills. *ELTALL: English Language Teaching, Applied Linguistic and Literature*, 5(2), 148-156. <https://doi.org/10.21154/eltall.v5i2.9146>
- Moybeka, A. M. S., Syariatn, N., Tatipang, D. P., Mushthoza, D. A., Dewi, N. P. J. L., & Tineh, S. (2023). Artificial Intelligence and English Classroom: The Implications of AI toward EFL Students' Motivation. *Edumaspul: Jurnal Pendidikan*, 7, 2444-2454. <https://doi.org/10.33487/edumaspul.v7i2.6669>
- Qomariyah, S. (2024). Students' Perceptions of Cakap Application as a Tool for Learning English Speaking Skills. *ELP (Journal of English Language Pedagogy)*, 9(2), 204-214. <https://doi.org/10.36665/elp.v9i2.942>
- Rambe, R. A., & Ali Amran, M. (2024). Using Fondi Application to Escalate the Speaking Ability of EFL High School Students. *Journal of English Language Teaching and Learning (JELTL)*, 5(1), 9-18. <https://doi.org/10.31004/jele.v9i5.537>
- Rahman, A., & Sari, D. (2023). The role of artificial intelligence in enhancing English language teaching: Opportunities and challenges. *Journal of Language and Education*, 9(2), 45-58. <https://doi.org/10.17323/jle.v9i2.1234>
- Rebolledo Font de la Vall, Roxana & Gonzalez Araya, Fabian. (2023). Exploring the Benefits and Challenges of AI-Language Learning Tools. *International Journal of Social Sciences and Humanities Invention*, 10, pp. 7569-7576. <http://dx.doi.org/10.18535/ijsshi/v10i01.02>
- Rosyid, A., & Hidayati, P. S. (2020, October). Teaching pronunciation through MALL: Promoting EFL learners' pronunciation and their learning autonomy. In L. Mayani, E. Siagian, I. Safitri, R. Dwiyan, & L. Kharismawati (Eds.), *The Eleventh Annual International Symposium of Foreign Language Learning (AISOFOLL)* (pp. 45-61). Jakarta, Indonesia: SEAMEO Regional Centre for Quality Improvement of Teachers and Education Personnel (QITEP) in Language (SEAQIL).
- Setiyaningsih, S., & Nurjanah, K. (2025). Analisa Implementasi Aplikasi ELSA Speak Berbasis Mobile dalam Peningkatan Keterampilan Berbicara Bahasa Inggris. *Jurnal REKLAMASI: Rekayasa Aplikasi, Multimedia dan Sistem Informasi*, 1-6.

- Setiawati, Yulis. (2024). Building a Foundation for Global Competence: Improving English Language Instruction in Indonesian Curriculum. *Journal of Foreign Language Learning and Teaching*, 3, 11-20. <http://dx.doi.org/10.23971/jfltl.v3i2.6955>
- Sindermann, C., Sha, P., Zhou, M., Wernicke, J., Schmitt, H., Li, M., Sariyska, R., Stavrou, M., Becker, B., & Montag, C. (2021). Assessing the attitude towards artificial intelligence: Introduction of a short measure in German, Chinese, and English Language. *KI-Künstliche Intelligenz*, 35(1), 109-118. <https://doi.org/10.1007/s13218-020-00689-0>
- Trisoni, Ridwal & Ardiani, Indah & Herawati, Susi & Mudinillah, Adam & Maimori, Romi & Khairat, Annisaul & David, David & Nazliati, Nazliati. (2023). The Effect of Artificial Intelligence in Improving Student Achievement in High Schools. Pp. 546-557. https://doi.org/10.2991/978-2-38476-142-5_50
- Wibowo, A, G, et al. (2023). A Use of Technology in Active Learning: Increasing Student Interaction and Engagement. *Al-Hijr: Journal of Adulern World*, 2(4), 271-293. <https://doi.org/10.55849/alhijr.v2i4.539>
- Widiati, U., & Cahyono, B. Y. (2021). English language teaching in Indonesia: Challenges and prospects. *TEFLIN Journal*, 32(1), pp. 1–15. <http://dx.doi.org/10.47709/ijeal.v1i3.1157>
- Yuliandari, Ketut & Ratminingsih, Ni & Santosa, Made. (2025). The Effect of Quillbot on The Eleventh-Grade Students' Writing Skills and Academic Integrity at Senior High School. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*. 13. 146-172. <http://doi.org.10.24256/ideas.v13i1.6177>.