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Implementing artificial intelligence (AI) in teaching english: A case study at SMP Muhammadiyah 1 Surakarta

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ABSTRACT

This study investigates the implementation of Artificial Intelligence (AI) in teaching English at SMP Muhammadiyah 1 Surakarta. It employed a qualitative case study approach involving an English teacher, Mrs. FAM, who was selected based on her innovative contributions to AI adoption in English language instruction. Data were collected through semi-structured interviews, participant observation, and documentation. The interview was conducted in Indonesian to obtain richer and more detailed information, while classroom observation involved 32 students to examine the implementation of AI, student-teacher interaction, effectiveness, and possible barriers. The findings reveal that AI was mainly used as a supporting tool in lesson preparation, material development, instructional media, and evaluation. In practice, AI-assisted materials were not used directly, but were first reviewed and adapted to suit the curriculum and students' needs. The implementation was reflected in the teaching of question tags and passive voice through the use of Google Sites, PowerPoint, projectors, and AI tools such as ChatGPT and Gemini. In addition, evaluation was conducted through individual exercises on Google Sites, allowing students to receive immediate scores. The study concludes that AI plays a complementary role in supporting more practical and organized English language teaching, although its effectiveness depends on the teacher's pedagogical adaptation.

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INTRODUCTION

AI is the ability of computers or robots to perform tasks that are generally done by humans (Wang, 2019). AI includes machine learning and natural language processing techniques (Chen et al., 2024). Artificial intelligence is designed to assist and simplify human work or activities through modern and advanced data analysis capabilities (Harry & Sayudin, 2023). In this context, AI is designed to enable computers to learn and adapt based on the data provided, without explicit programs for each different task classroom learning practices in an effort to increase student engagement, personalize learning, and improve efficiency (Lubis, 2021).

The development of Artificial Intelligence (AI) technology in education has experienced rapid growth in recent years. The use of AI in learning helps teachers speed up the evaluation process, provide automatic feedback, and provide more personalised learning resources for students (Marrone et al., 2022). (Singh & Aziz, 2025)(Zhou & Peng, 2025) states that AI has great potential to transform learning practices by increasing efficiency, creativity, and access to educational materials. In Indonesia, the use of AI is increasing with the emergence of various platforms such as ChatGPT, Grammarly, Quillbot, and Google Gemini, which are beginning to be used by teachers and students in learning activities (Hamid et al., 2025).

Unlike other digital technologies such as conventional learning management systems or multimedia platforms that mainly function as content delivery tools, AI offers adaptive and intelligent features such as real-time feedback, automated assessment, and personalized learning pathways. These capabilities make AI more responsive to individual student needs, particularly in English language learning where continuous practice, immediate correction, and language interaction are essential. Therefore, the urgency of integrating AI lies in its ability to not only support learning but also actively shape and optimize the learning process in ways that traditional digital technologies cannot achieve.

The development of digital technology in education is closely linked to the integration of technology into language learning (Shao et al., 2025). Technology has been proven to enhance the quality of instruction and students' learning experiences, particularly in the context of EFL, through the use of online platforms, apps, and multimedia that support engagement, motivation, and language proficiency (Zhang et al., 2020). Additionally, technology fosters more interactive and flexible learning (Hasumi & Chiu, 2024). However, its implementation still faces challenges, such as limited teacher training, access to digital resources, and the lack of standardized pedagogical models (Chou & Zou, 2020). Therefore, the effectiveness of technology use depends heavily on teacher readiness and integration strategies in the classroom (Putranto et al., n.d.).

The rapid advancement of digital technology has transformed education, requiring teachers and students to adapt while enabling broader access to information, flexible learning, and improved digital skills (Kazmaci et al., 2025). Artificial Intelligence (AI) further supports English language learning by enhancing writing and speaking skills through improved grammar, vocabulary, and real-time feedback (Anggraeni, 2025). However, the integration of AI in classroom practices is not without challenges. Teachers often face difficulties in understanding how AI works, selecting appropriate tools, and aligning AI usage with pedagogical objectives and curriculum standards. In addition, concerns regarding students' overreliance on AI, reduced critical thinking, and academic integrity issues also emerge as significant obstacles (Delello et al., 2025). In the Indonesian context, these challenges are further compounded by limited infrastructure, unequal internet access, and insufficient professional training in digital and AI literacy (Purmayanti, 2022)(Rahmandani et al., 2025). These challenges form a crucial basis for investigating how AI is actually implemented by teachers in real classroom settings.

In Indonesia, the government has encouraged the integration of digital technology in education through various policies, including efforts to improve teachers' digital literacy (Karengga, 2025). However, the implementation of AI in schools is still developing and has not been fully optimized (Widodo et al., 2024). Many teachers are still exploring how AI can be effectively integrated into teaching practices, particularly in aligning its use with pedagogical approaches and curriculum objectives (Susilowati et al., 2025). This indicates a gap between the potential of AI and its real application in Indonesian schools. Furthermore, previous studies on AI in education have predominantly focused on quantitative outcomes such as learning achievement, student perceptions, or general effectiveness of AI tools. There is still a lack of in-depth qualitative research that examines how AI is practically implemented by teachers in classroom contexts, particularly at the junior high school level in Indonesia. Specifically, limited studies explore how AI is integrated into teaching methods, learning materials, instructional media, and evaluation

processes as part of daily teaching practices. This empirical gap highlights the need for context-specific investigation to understand the real dynamics of AI integration in schools.

A similar condition can be observed at SMP Muhammadiyah 1 Surakarta, where digital technology has begun to be integrated into classroom practices. English teachers have started to utilize AI tools such as ChatGPT, Grammarly, and Google Gemini to support lesson preparation, material development, and classroom activities. However, the use of AI in this context remains in an early stage and tends to be applied in a practical and flexible manner rather than through a structured implementation.

These conditions indicate that AI has been introduced into classroom practices, particularly in supporting teaching methods, learning materials, instructional media, and evaluation processes. However, studies that specifically describe how AI is implemented in real classroom settings, especially at the secondary school level in Indonesia, are still limited. Most previous studies tend to focus on learning outcomes, technology effectiveness, or general perceptions of AI, rather than examining the actual process of how teachers integrate AI into their teaching practices.

Therefore, this study aims to analyze the implementation of AI tools in English language teaching at SMP Muhammadiyah 1 Surakarta. Using a qualitative case study approach, this research focuses on how teachers integrate AI into teaching methods, learning materials, instructional media, and evaluation. The findings of this study are expected to provide a clearer understanding of practical AI implementation in classroom settings and contribute to the development of more effective technology-based teaching practices.

RESEARCH METHODOLOGY

This study applied a qualitative case study approach. This approach was chosen because it allows an in-depth exploration of how AI is implemented in real classroom contexts, focusing on processes, interactions, and contextual factors that cannot be captured through quantitative methods. A case study is particularly suitable for examining complex educational practices, such as AI integration, where the researcher seeks to understand not only what happens but also how and why it occurs within a specific setting. The subject was the English teacher at one of junior high schools in Solo, namely Mrs FAM, 37 years old who has a Master's Degree in English education. She has ten years of teaching experiences at the junior high school level for grades 7–9. Her professional career is marked by achievements such as being the Teacher Leader of the 7th Cohort, serving as a pre-service teacher education (PPG) assessor four times, and implementing leadership projects. Its selection was based on her innovative contributions as a pioneer in the adoption of AI in English language instruction, coupled with her role in facilitating demonstration seminars for teachers at the research site, which is relevant to the focus of this study. Data were collected through semi-structured interview, using Indonesian to get more detail data. Recordings were made for verbatim transcription to explore the informants' perceptions of AI use in the classroom. Additionally, participant observation was conducted in the classroom which consisted of 32 students to directly observe the implementation of AI (Gemini AI), student-teacher interactions, effectiveness, and process barriers. Observation documentation utilized authentic teaching modules requested directly from the informant. The data were analyzed qualitatively.

RESULTS AND DISCUSSIONS

Result

The implementation of AI tools in teaching English covered the methods applied by the teacher, the learning materials, the instructional media, the evaluation process and the reasons for using AI.

In implementation of AI in teaching English, the teacher used two methods. First, the outputs generated by AI were not used directly. Instead, the teacher reviewed and adjusted them before applying them in class to ensure that they matched the curriculum and students' level of understanding. The teacher emphasized that AI only served as a supporting tool, while the final material still needed to be selected and adapted by the teacher. The teacher emphasized that *"the material from AI cannot be used immediately; it must first be checked and adjusted to the curriculum and student needs."* Classroom observation showed that the teaching materials had been simplified and structured according to students' learning needs. Documentation data also confirmed that the materials had been arranged in a more accessible form before being shared with students.

Second, the AI-assisted materials were integrated into digital learning media, especially Google Sites, which functioned as the main platform for delivering exercises and materials. As explained by the teacher, "*I put the material from AI into Google Slides so that students can work on it and get feedback*." In addition, the teacher also used PowerPoint (PPT) as a presentation medium, which was displayed through a projector in the classroom. Based on classroom observation, the materials were presented in a structured format consisting of explanations, examples, and exercises. Documentation data also showed that the teacher combined several digital tools to make the learning process more interactive and easier for students to follow.

The implementation of AI was reflected in the learning materials used during the lesson. The materials covered two topics for ninth-grade students, namely question tags and passive voice. In the lesson on question tags, students were guided to understand the structure and function of question tags and to apply them in communication. In the lesson on passive voice, students learned how active sentences are changed into passive forms and how passive constructions are used in context. Classroom observation showed that the learning procedures for both materials were generally similar, beginning with explanation and examples, followed by guided practice. However, in the passive voice lesson, the teacher did not use a YouTube video, and the explanation was instead delivered through PPT. Documentation data also indicated that the learning objectives focused on students' ability to understand and use both question tags and passive voice correctly.

In addition, the implementation of AI was supported by various instructional media, including Google Sites, PPT, projectors, smartphones, and AI tools such as Gemini. As stated by Mrs.FAM, "*I use Gemini with Google Slides so students can practice and see their mistakes*." The teacher combined these media to support the delivery of materials and classroom activities. Classroom observation showed that PPT was used to explain the lesson directly in class, while Google Sites was used as a digital space for accessing materials and completing exercises. Documentation data further confirmed that these media were integrated to support a more effective and technology-based learning process.

In the evaluation process, students' understanding was assessed through exercises provided in Google Sites. After completing the tasks, the students could immediately see their scores on the platform. Mrs. FAM stated, *Students complete the exercises through Google Sites, and they can directly see their scores after submitting their answers."* Because the lesson materials included both question tags and passive voice, the evaluation process also covered both topics. Classroom observation showed that students worked individually on the questions in Google Sites without group discussion activities. The teacher monitored students' work during the process and used the results displayed on the platform to identify their level of understanding. Documentation data confirmed that the evaluation was conducted through online exercises, and the scoring system allowed students to receive direct feedback after submission.

This study found two teasons in using AI. First, it is used AI mainly to make it easier to explore learning materials and instructional media. Sedons, it is use to support tool during lesson preparation. Based on the interview, the teacher stated that she used AI to search materials which apropriated to the students' needs. Mrs FAM: *"I use AI to find ideas for learning materials and activities. Usually to help with lesson preparation."* Classroom observation showed that the lesson was

delivered in a structured sequence, beginning with topic introduction, followed by explanation and guided learning activities. Documentation data also indicated that several materials and exercises were prepared with the assistance of AI tools.

Discussion

The findings of this study show that the implementation of Artificial Intelligence (AI) in English language teaching at SMP Muhammadiyah 1 Surakarta was reflected in the reasons for using AI, the teaching methods, the learning materials, the instructional media, and the evaluation process. In this context, AI was primarily used as a supporting tool to facilitate the exploration of learning materials and instructional media, particularly in the preparation of grammar lessons for ninth-grade students. The use of tools such as ChatGPT and Gemini indicates that AI assisted the teacher mainly in planning and organizing classroom instruction rather than replacing the teacher's role in the learning process.

This finding confirms that AI functioned as a complementary tool in instructional planning. The teacher did not apply AI-generated outputs directly in the classroom, but first reviewed, selected, and adjusted them according to the curriculum and students' level of understanding. This suggests that the pedagogical authority remained in the hands of the teacher, while AI served to simplify the preparation of content and media. Such a pattern shows that the effectiveness of AI in classroom practice depends not merely on the availability of technology, but on the teacher's ability to adapt and contextualize the generated materials.

The findings also indicate that the use of AI contributed to the effectiveness of teaching grammar, particularly in topics such as question tags and passive voice. AI-assisted materials enabled the teacher to prepare structured explanations, relevant examples, and guided exercises more efficiently. This structured delivery supported students in understanding grammatical forms and applying them in context. In addition, the use of Google Sites for evaluation, which provided immediate feedback, helped students identify and correct their errors directly. Although the study does not quantitatively measure learning outcomes, classroom observations suggest that AI supported a clearer, more organized, and feedback-oriented grammar learning process, which are key indicators of instructional effectiveness.

Furthermore, the implementation found in this study reflects the idea of adaptive learning environments proposed by (Holmes, 2020), in which technology supports flexible and responsive teaching practices. The findings revealed that AI-generated materials were filtered and modified before being used in class. This indicates that AI was not treated as an independent source of instruction, but rather as a resource that enabled the teacher to prepare materials more efficiently while still aligning them with students' needs and the classroom context. In this case, adaptation became a key aspect of implementation, since the teacher remained responsible for ensuring that the content was appropriate and understandable.

The findings also have important implications for adaptive learning and personalized learning theories. From an adaptive learning perspective, AI supported the teacher in adjusting instructional materials based on students' level of understanding, even though the adaptation process was still manually controlled by the teacher. This indicates that AI functioned as a tool that enhanced the teacher's capacity to create responsive learning environments. From a personalized learning perspective, AI contributed indirectly by enabling the preparation of materials that were more aligned with students' needs and by providing immediate feedback through digital platforms. However, personalization in this study was not fully automated, but rather mediated through teacher decisions, suggesting that AI currently plays a supportive rather than autonomous role in achieving personalized learning.

The findings are also in line with the concept of personalized learning discussed by (Luckin & Holmes, 2016). Although the implementation in this study was still relatively basic, AI supported the preparation of learning materials that were more suited to students' abilities and instructional objectives. This was evident in the teaching of two grammar topics, namely question

tags and passive voice. The inclusion of both topics shows that AI was not limited to supporting a single lesson, but could also assist the teacher in preparing multiple grammar materials with similar instructional patterns. At the same time, the teacher still adapted the presentation of each topic based on the learning context.

In terms of learning materials, the findings demonstrate that both question tags and passive voice were taught through a similar sequence of explanation, examples, and guided practice. However, there were also differences in the media used to deliver the lessons. In the passive voice lesson, the teacher did not use YouTube video as in the previous material, but instead relied on PowerPoint presentation. This suggests that AI was useful not only in helping the teacher explore the content of learning materials, but also in supporting the selection and combination of instructional media. Therefore, the contribution of AI in this study extended beyond material development to the practical organization of teaching delivery.

The findings of this study are consistent with previous research on AI in language learning, but also provide more specific contextual insights. (Falloon, 2020) and (Gyawali & Mehandroo, 2022) emphasize that AI can support material development and reduce lesson preparation time, which is clearly reflected in this study. Similarly, studies such as (Saleem et al., 2025) highlight the role of AI in enhancing classroom practices and learning efficiency. However, unlike many previous studies that focus on learning outcomes or student perceptions, this study reveals that AI is primarily used at a practical level, namely as a supporting tool for preparing materials, organizing instruction, and facilitating evaluation. In contrast to studies that present AI as an interactive learning partner or autonomous system, the findings here show that AI integration remains teacher-centered, with the teacher maintaining full control over content and pedagogy.

An important point in this study concerns the evaluation process, which was directly connected to the addition of learning materials. Since the lesson covered both question tags and passive voice, the evaluation also included exercises on both topics. However, unlike interactive or collaborative forms of evaluation, the assessment in this study was carried out only through individual exercises in Google Sites. Students completed the questions provided on the platform, and once they finished, their scores appeared automatically. There was no discussion activity in this evaluation process. This finding is important because it shows that the role of AI-supported digital media in evaluation was mainly practical, namely facilitating online exercises and enabling immediate scoring. In other words, the evaluation process in this study emphasized efficiency and direct feedback rather than collaborative interaction. This finding also strengthens the argument of (Saleem et al., 2025), who highlight the role of AI in enhancing classroom practices in English language learning. However, this study offers a more specific contribution by showing that, at the secondary school level, AI was used mainly as a technical and pedagogical support tool for preparing grammar materials, presenting them through digital media, and facilitating online evaluation. AI was not implemented here as an interactive communication partner or autonomous teaching system, but as a practical resource that supported structured classroom instruction.

Overall, the findings suggest that AI played a complementary role in English language teaching. Its implementation was evident in helping the teacher explore materials, adapt instructional content, select suitable media, and conduct digital evaluation. The alignment between the learning materials and the evaluation process in this study also shows that AI-supported platforms such as Google Sites can make assessment more efficient and immediate. Nevertheless, the successful use of AI still depends on how far teachers are able to integrate it meaningfully into classroom practice and align it with pedagogical objectives.

CONCLUSION

This study concludes that the implementation of Artificial Intelligence (AI) in English language teaching at SMP Muhammadiyah 1 Surakarta was reflected in lesson preparation, material

development, instructional media, and evaluation. AI was mainly used as a supporting tool to help the teacher explore learning materials and media more efficiently. In practice, the teacher did not use AI-generated outputs directly, but first reviewed and adjusted them to fit the curriculum and students' learning needs. The implementation was evident in the teaching of question tags and passive voice, which were delivered through structured instruction supported by Google Sites, PowerPoint, projectors, and AI tools such as ChatGPT and Gemini.

The findings also show that AI contributed to making the teaching process more organized and practical, especially in preparing grammar materials and conducting digital evaluation. The evaluation process was carried out through individual exercises on Google Sites, where students completed questions and received their scores immediately after submission. This indicates that AI-supported digital tools can facilitate more efficient classroom preparation and assessment. However, the role of AI in this study remained complementary, since its effectiveness still depended on the teacher's ability to adapt the generated content and integrate it into pedagogically appropriate classroom practices.

This study suggests several directions for future research. First, further studies can employ quantitative or mixed-method approaches to measure the impact of AI on students' learning outcomes, particularly in grammar mastery and language skills development. Second, future research may explore the implementation of AI across different educational levels and subjects to provide broader comparative insights. Third, there is a need to investigate more advanced forms of AI integration, such as adaptive learning systems or AI-based interactive tools, to examine their potential in supporting fully personalized learning. Lastly, future studies could focus on students' perspectives and engagement to better understand how AI influences their learning experiences in classroom settings.

In terms of practical implications, this study recommends that teachers use AI as a supportive tool rather than a substitute for pedagogical decision-making. Teachers should critically review and adapt AI-generated materials to ensure alignment with curriculum objectives and students' needs. In addition, integrating AI with digital platforms such as Google Sites or presentation tools can enhance the organization of learning materials and facilitate efficient evaluation. Teachers are also encouraged to gradually develop their digital and AI literacy through training and practice, so that they can utilize AI more effectively and responsibly in classroom instruction. By doing so, AI can be meaningfully integrated to support teaching while maintaining the central role of the teacher in guiding the learning process.

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