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ENHANCING GRADE 6 STUDENTS' MASTERY OF THE PAST TENSE THROUGH AI-DRIVEN LEARNING

Ahmad Faisal[*1], Misrita[12], Librina Tria Putri[3]
[1]*Magister of English Education, University of Palangka Raya*
[2]*Department of Forestry, Faculty of Agriculture, University of Palangka Raya*
[3]*University of Riau*
[*]ahmadfaisal250987@gmail.com

Abstract

The study investigated the effectiveness of AI-driven learning tools in enhancing Grade 6 students' mastery of the past tense in English grammar. The research aimed to explore how artificial intelligence could be leveraged to facilitate personalized, adaptive learning experiences that promoted better retention and application of past tense rules. Employing a mixed-methods approach, the study combined quantitative measures of grammar proficiency with qualitative data from interviews and observations of student interactions with AI-based learning platforms. The participants, consisting of 60 Grade 6 students from a public school in an urban setting, engaged with an AI-powered application over a period of 8 weeks. Results indicated a significant improvement in students' understanding and use of the past tense, with students reporting higher engagement and confidence in grammar tasks. The findings underscored the potential of AI tools to provide tailored learning experiences that catered to individual learning paces and styles. The study concluded that AI-driven learning environments could enhance grammar acquisition in elementary education, offering implications for future integration of technology in English language teaching.

Keywords: AI-Driven Learning, Past Tense Mastery, Elementary Education, Grammar Proficiency, Adaptive Learning

INTRODUCTION

The teaching and learning of English grammar is a fundamental aspect of language education, particularly in primary school settings where foundational language skills are established. While traditional teaching methods, such as rote memorization and teacher-centered instruction, continue to dominate, the integration of educational technology, especially artificial intelligence (AI), presents new opportunities for transforming language acquisition. AI-powered tools have shown promise in various educational contexts, yet their impact on grammar instruction, particularly for younger learners, remains an area that requires further investigation.

Recent studies have explored the role of technology in grammar instruction. For instance, Golonka et al. (2014) highlighted the effectiveness of computer-assisted language learning (CALL) tools, which provide immediate feedback and adapt to student progress, leading to significant improvements in language acquisition. Similarly, research by Boulton and Cobb (2017) emphasized the potential of technology to enhance grammar instruction by offering interactive and engaging learning experiences. However, much of this research has focused on secondary or higher education, leaving a notable gap in understanding how AI-driven learning tools affect elementary students.

Moreover, Godwin-Jones (2018) pointed out the growing importance of AI in creating personalized learning paths, which can enhance differentiation and tailored instruction. Despite the potential of these tools to support grammar learning, there is a lack of focus on the specific needs and engagement strategies required for elementary learners, particularly in mastering complex grammatical

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concepts such as the past tense. Existing literature primarily addresses general language learning or isolated skills, such as vocabulary acquisition, while the mastery of specific grammatical points like verb tense remains under-explored (Li et al., 2021).

This study aims to address this gap by investigating the effectiveness of AI-driven learning tools in enhancing Grade 6 students' mastery of the past tense in English grammar. Unlike previous studies that have broadly examined the role of AI in language learning, this research specifically focuses on the challenges associated with past tense formation, an area well-documented as difficult for young learners. By employing a mixed-methods approach that combines quantitative measures of grammar proficiency with qualitative insights from student interactions with AI-based platforms, this study offers a comprehensive understanding of the impact of AI on both academic performance and student engagement.

The uniqueness of this research lies in its specific focus on the mastery of past tense grammar, contrasting with prior studies that may not have concentrated on this particular aspect of language instruction. Additionally, the mixed-methods design allows for a nuanced exploration of the learning experience, providing insights into both cognitive and affective dimensions of language acquisition. By addressing these gaps and exploring the comparative effectiveness of AI tools versus traditional methods, this study aims to contribute new insights into how emerging technologies can reshape the foundational stages of language education.

RESEARCH METHODS

This study utilizes a mixed-methods research design, combining quantitative data analysis with qualitative insights to provide a comprehensive understanding of the impact of AI-driven learning on students' grammar proficiency.

Participants

The study included 60 Grade 6 students from a public school in an urban area, aged 11 to 12 years. Students were randomly assigned to the experimental group (AI-driven learning) or the control group (traditional teaching methods). Both groups learned the past tense using the same curriculum and materials. However, the experimental group utilized an AI-powered educational tool for personalized practice, while the control group received instruction through conventional teaching methods without the use of AI technology.

AI-Driven Learning Tool

The AI-driven learning tool used in this study was an interactive mobile application designed to teach English grammar, with a particular focus on tense forms. The app utilized machine learning algorithms to assess students' grammar skills and adapt the difficulty of tasks based on their performance. Features included grammar quizzes, fill-in-the-blank exercises, and real-time feedback that corrected mistakes and explained the rules behind the past tense forms.

Data Collection and Analysis

Data collection included pre- and post-test assessments to measure students' proficiency in past tense usage. The tests included a mix of multiple-choice questions, sentence construction tasks, and short writing prompts to assess both recognition and production of past tense forms. In addition to the tests, qualitative data were gathered through student surveys, interviews with teachers, and classroom observations. The qualitative data helped provide context to the quantitative findings by capturing students' experiences and attitudes toward the AI tool. Data analysis involved statistical techniques to compare the pre- and post-test scores of the experimental and control groups. Thematic analysis was used to analyze the qualitative data from student surveys and interviews.

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RESULTS

Quantitative Results

The study revealed significant improvements in grammar proficiency among the experimental group compared to the control group. Pre-test and post-test scores were analyzed to determine the effectiveness of the AI-driven learning tool. The experimental group demonstrated an average score increase of 25%, rising from a pre-test mean score of 60 to a post-test mean score of 75. In contrast, the control group, which followed traditional teaching methods, showed a more modest improvement of 10%, with their mean score increasing from 62 to 68.

Table 1. Pre-Test and Post-Test Scores for Experimental and Control Groups

Group	Pre-Test Mean Score	Post-Test Mean Score	Score Increase (%)
Experimental	60	75	25%
Control	62	68	10%

A paired t-test was conducted to assess the statistical significance of the improvements within each group. For the experimental group, the results showed a highly significant increase ($t = 5.89$, $p < 0.001$). The control group's improvement, while statistically significant ($t = 2.45$, $p < 0.05$), was less pronounced compared to the experimental group. Additionally, an independent t-test comparing post-test scores between the two groups revealed a significant difference ($t = 4.72$, $p < 0.01$), indicating that the AI-driven learning tool had a more substantial impact on grammar proficiency. The effect size, calculated using Cohen's d, was 0.8 for the experimental group, reflecting a large and meaningful impact.

A deeper analysis of the score distribution showed that 80% of students in the experimental group scored above 70 on the post-test, compared to only 50% in the control group. This significant difference suggests that the AI tool played a crucial role in improving students' performance, helping a larger proportion of students achieve higher proficiency levels in past tense grammar, thereby demonstrating its effectiveness.

The quantitative results strongly support the hypothesis that AI-driven learning tools significantly enhance grammar proficiency. Students using the AI tool demonstrated higher improvements in mastery of the past tense compared to those using traditional methods, as evidenced by both descriptive statistics and inferential analysis.

Qualitative Insights

The qualitative findings complemented the quantitative results by revealing students' experiences with the AI tool. Many students expressed excitement, describing the app as a refreshing alternative to traditional grammar exercises, highlighting its appeal and engagement in enhancing their learning process. One student shared:

> *"It doesn't feel like studying; it's more like playing a game where I can see myself improving."*

This sentiment was echoed in observations from teachers, who noted that students seemed more engaged and less apprehensive when tackling grammar tasks. The app's interactive features, such as immediate feedback and real-time progress tracking, contributed significantly to this enthusiasm, making learning feel rewarding and dynamic.

The tool's adaptive nature was another aspect that resonated deeply with students. It catered to a wide range of abilities, ensuring that all learners could benefit regardless of their starting proficiency. For instance, slower learners reported feeling more confident because the app allowed them to revisit simpler exercises until they fully understood the material. One student admitted:

> *"I used to feel frustrated when I couldn't keep up in class, but with this app, I could go at my own pace and not feel left behind."*

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Conversely, advanced students appreciated the challenge posed by increasingly difficult tasks.

"I liked how it pushed me to do more."

On the other hand, another student said as follow:

"It felt satisfying to unlock harder questions and see how far I could go."

This adaptability not only supported individual progress but also cultivated a sense of achievement, as students frequently mentioned the pride they felt in tracking their own improvement.

Teachers also observed shifts in classroom dynamics, noting that students using the AI tool appeared more confident and self-reliant during grammar exercises. Several students, who had previously been hesitant to participate in class, began engaging more actively. A teacher shared:

"I could see them taking ownership of their learning. They weren't just waiting for my feedback—they were figuring things out on their own and feeling proud of it."

This empowerment was particularly evident during group discussions, where students who had used the app often took the lead in explaining grammar concepts to their peers.

Despite its strengths, the AI tool was not without its challenges. Some students, particularly younger ones or those with limited experience using digital devices, found the app's interface difficult to navigate at first. One student admitted:

"I didn't know where to start, so I had to ask my teacher to help me figure it out."

Teachers noted that this initial hurdle could have been mitigated with the inclusion of tutorials or step-by-step guides. Another area for improvement was the app's content, which some teachers felt could benefit from more culturally diverse examples. They explained that incorporating scenarios and contexts that resonate with students' everyday lives would make the learning experience even more relatable and impactful.

These insights underline the transformative potential of AI-driven tools in creating engaging, personalized, and effective learning environments. While the quantitative results demonstrated the measurable improvements in grammar proficiency, the qualitative findings brought to life the human element of this transformation. By addressing the diverse needs of learners and ensuring accessibility for all, tools like these can not only enhance academic performance but also foster motivation, confidence, and a genuine love for learning.

AI-Driven Learning in Enhancing Past Tense Mastery

The study demonstrates the effectiveness of AI-driven learning in enhancing Grade 6 students' mastery of the past tense, showing improvements in both quantitative results, such as test scores, and qualitative feedback, including student engagement.

From a quantitative perspective, the experimental group demonstrated a 25% increase in their post-test scores, moving from a mean of 60 to 75, compared to a 10% improvement in the control group (from 62 to 68). The difference was statistically significant, with a paired t-test showing a strong result for the experimental group ($t = 5.89$, $p < 0.001$), while the control group showed a smaller improvement ($t = 2.45$, $p < 0.05$). This statistical evidence highlights the significant impact of the AI tool in improving grammar proficiency, particularly in mastering the past tense.

Table 2. Pre-Test and Post-Test Results with Statistical Significance

Group	Pre Test	Post Test	Improvement	t-value	significance
Experimental	60	75	25%	5.89	< 0.001
Control	62	68	10%	2.45	< 0.05

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The table above shows the statistical significance of the improvements in grammar proficiency between the experimental and control groups. The experimental group, using AI-driven learning, achieved a 25% improvement in their post-test scores (from 60 to 75), with a t-value of 5.89 ($p < 0.001$), indicating a highly significant effect. In comparison, the control group showed only a 10% improvement (from 62 to 68), with a t-value of 2.45 ($p < 0.05$), reflecting a smaller but still statistically significant improvement. These results highlight the effectiveness of AI-driven learning in enhancing students' mastery of the past tense.

On the qualitative side, students in the experimental group revealed that the AI tool provided a learning experience that was both engaging and empowering. A key feature that stood out was the adaptive nature of the app, which tailored tasks based on individual performance. One student mentioned:

> *"I liked how the app always knew when I was struggling and gave me easier tasks to help me catch up. It felt like it was on my side."*

This adaptive feedback system helped students build their skills progressively, reinforcing understanding without overwhelming them.

Furthermore, the students appreciated the immediacy of the feedback provided by the AI tool. Rather than waiting for teacher input, they could immediately see their mistakes and make corrections. This instantaneous feedback was particularly helpful for students who often felt unsure about their past tense usage. A student expressed:

> *"I could see where I went wrong and fix it right away, so it didn't feel like I was making the same mistake over and over."*

Teachers also observed a shift in classroom dynamics. Students who had been hesitant to speak up in class began to take a more active role in grammar discussions. The interactive and personalized nature of the AI tool encouraged these students to take initiative in explaining grammar concepts to their peers. One teacher noted:

> *"It was remarkable to see how some of the quieter students became more confident and started helping their classmates after using the AI tool."*

Although the AI-driven tool was highly effective, there were challenges. Some students found it difficult to navigate the interface at the beginning, which occasionally led to confusion. Teachers suggested that a more intuitive onboarding process or a tutorial could improve initial engagement. Despite this, once students became familiar with the tool, they reported feeling more in control of their learning.

In summary, both quantitative and qualitative findings indicate that AI-driven learning significantly enhances students' mastery of the past tense. By offering personalized, adaptive practice and immediate feedback, the AI tool not only boosted academic performance but also increased student confidence and engagement, making the learning experience more interactive and tailored to individual needs.

DISCUSSION

In this study, the effectiveness of AI-driven learning tools in enhancing Grade 6 students' mastery of the past tense in English grammar was explored through a mixed-methods approach. The quantitative results indicated a significant improvement in grammar proficiency—a 25% increase in post-test scores for the experimental group using AI compared to a 10% increase for the control group utilizing traditional methods. This aligns with existing research, such as by Smith and Johnson (2020), which demonstrated that AI-powered language learning tools significantly enhance student engagement and learning outcomes.

Specifically, the statistical significance of the improvements ($t = 5.89$, $p < 0.001$ for

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the experimental group) reinforces findings from previous studies, such as those by Golonka et al. (2014), who emphasized the importance of immediate feedback provided by AI tools in fostering language skills. Additionally, the effect size calculated (Cohen's d = 0.8) suggests a large and meaningful improvement, confirming trends noted in Brown and Green (2019), where personalized AI learning experiences led to enhanced language proficiency among younger students.

Qualitative data from student surveys and teacher interviews further illuminated the learning experience. Students reported increased confidence and motivation, echoing the sentiments articulated by Godwin-Jones (2018), who asserted the value of AI in creating personalized learning paths. For instance, one student mentioned, *"It doesn't feel like studying; it's more like playing a game where I can see myself improving."* This captured the transformative potential of AI in making grammar lessons more engaging and accessible, contrasting with the more traditional, one-size-fits-all approach that can leave learners frustrated and disengaged.

Furthermore, teachers observed that students using the AI tool demonstrated greater self-efficacy, aligning with work by Boulton and Cobb (2017), which highlighted the adaptable nature of AI in meeting individual learner needs. This qualitative insight complements the quantitative findings, suggesting not only improvements in academic performance but also in student attitudes towards learning grammar, thus supporting the hypothesis that AI-driven tools can provide a more dynamic and effective educational experience.

In summary, the findings of this study are consistent with previous literature that advocates for the integration of AI in education while also contributing new insights specific to the mastery of the past tense. By demonstrating significant improvements in both quantitative test scores and qualitative student engagement, this research underscores the potential of AI-driven tools to reshape foundational language education. As such, further exploration of AI's role in language instruction could yield valuable strategies for enhancing learning outcomes across diverse contexts.

CONCLUSION

The findings of this study confirm that AI-driven learning tools significantly enhance Grade 6 students' mastery of the past tense in English grammar, demonstrating substantial improvements in both grammar proficiency and student engagement compared to traditional teaching methods. The quantitative results revealed a marked increase in post-test scores for the experimental group, while qualitative insights highlighted increased motivation, confidence, and a more interactive learning experience among students. Overall, the research underscores the transformative potential of AI tools in education, suggesting that their integration can create more personalized and effective learning environments that cater to diverse learner needs and foster a genuine enthusiasm for mastering language concepts.

REFERENCE

Aguion, M. A. R. (2021). Language translation as a reading comprehension test: A meta-analysis. *Linguistic Forum - A Journal of Linguistics, 3*(4), 7–10. http://doi.org/10.53057/linfo/2021.3.4.2.

Anderson, T. (2019). *AI and the Future of Learning: Education in the Age of Artificial Intelligence*. Brookings Institution Report.

Boulton, A., & Cobb, T. (2017). Reconsidering the role of technology in grammar instruction. *The Modern Language Journal, 101*(1), 1-16.

Brown, A., & Green, T. (2019). Personalized learning through AI: Enhancing language proficiency in primary education. *Language Learning & Technology, 23*(4), 45-60.

Journal Compound
ISSN: 2338-4042 EISSN: 2747-0091
https://doi.org/10.37304/jcp.v12i1.2829

Castro, J. S. (2023). Exploring the lived experiences of ESL teachers in the teaching of English subjects. *UC Journal: ELT, Linguistics and Literature Journal, 4*(1), 1–12. https://doi.org/10.24071/uc.v4i1.5657.

Chan, Y. (2022). Comparing traditional and AI-assisted methods of grammar instruction: A study on sixth-grade students. *Journal of Applied Linguistics, 18*(1), 10-30.

Dash, B. B. (2022). Digital tools for teaching and learning the English language in the 21st century. *International Journal of English and Studies, 4*(2), 8–13. https://doi.org/10.47311/IJOES.2022.4202.

Godwin-Jones, R. (2018). Emerging technologies: Language learning in the age of artificial intelligence. *Language Learning & Technology, 22*(2), 1-15.

Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L., & Snyder, S. (2014). Technologies for foreign language learning: A review of technology types and their effectiveness. *Computer Assisted Language Learning, 27*(1), 70-105.

Johnson, M., & Smith, K. (2021). *AI in Education: Transforming Language Learning*. New York: Routledge.

Kim, S., & Park, H. (2021). Evaluating the effectiveness of mobile applications in language learning: A focus on grammar. *Computers & Education*, 157, 103972.

Kukulska-Hulme, A. (2020). Mobile-assisted language learning [MALL]: A transformative approach. *International Journal of Mobile and Blended Learning, 12*(4), 1-16.

Li, L., Zhang, M., & Liu, Z. (2021). The effectiveness of AI-assisted language learning tools in improving grammar acquisition: A review. *Journal of Educational Technology & Society, 24*(3), 102-115.

Li, X., & Zheng, Y. (2020). A review of AI applications in language learning and teaching. *International Journal of Language Studies, 14*(3), 77-95.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1-6.

Smith, J., & Johnson, L. (2020). The impact of artificial intelligence on language learning: A meta-analysis. *Journal of Educational Technology, 15*(2), 123-135.

Smith, R. (2017). *The Future of Language Learning: Harnessing Technology for Grammar Instruction*. Cambridge University Press.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*(2), 257-285.

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes.* Harvard University Press.

Williams, R. (2018). Adaptive learning technologies in language education. In *Proceedings of the International Conference on Education Technology* (pp. 56-62).