Factors Affecting the Effectiveness of Students’ English Grammar Learning through AI Tools

Tham Truong Thi1

Abstract

Thanks to the rapid and extraordinary development of Artificial Intelligence (AI) these days, human beings seem to save labour and time on undertaking their work. AI can be employed in almost every aspect of life, including education. Accordingly, teaching and learning English is an area where AI plays a significant role, assisting teachers and learners. In this paper, the author aims to explore the factors affecting the effectiveness of learning English grammar through AI tools among second-year students at the University of Labour and Social Affairs (Campus 2) (ULSA2). The researcher selected 68 students in her classes as samples for the study. In terms of data collection, a questionnaire and an interview were carefully and systematically chosen and designed. The findings of the study mainly showed that the students achieved positive results in learning English grammar through ChatGPT and Duolingo. There are factors, such as a native English accent and a flexible physical learning environment, affecting students’ learning positively. On the other hand, some social factors, such as inhumane interactions, the temptations of social networks, and other mobile phone applications, have negative impacts on students’ learning process. Overall, teachers’ interaction and students’ intrinsic discipline and attitudes still play essential roles in the achievement of learning processes, even in the age of AI.

***Keywords*:** AI tools, English grammar learning, social and external factors, interaction, intrinsic discipline, and attitudes.

1. Introduction

The latest Artificial Intelligence development has affected many industries, including education, particularly teaching English (Khamar, 2025; Rashid & Kausik, 2024; Luu, 2024). Increasingly, educational models have been embracing AI tools, introducing new solutions to enhance students' learning, especially language learning (Yeh, 2024). These technologies are identified with their ability to give instant feedback and detailed explanations for linguistic activities; therefore, they become valuable and worth it to learners and instructors in modern contexts of language learning and teaching (María et al., 2024)

 Tham Truong Thi, MA., English Lecturer, Faculty of Foreign Languages, University of Labour and Social Affairs Campus 2, Ho Chi Minh City, Vietnam; *Email: thamtt@ldxh.edu.vn*

In the increasingly globalized world, English proficiency is a crucial skill for higher education, professional, and personal development. English grammar lays down the basis for effective communication in the English language (The Importance of English Grammar: A Guide to Mastering the Language, 2024). Before the age of AI, grammar instructions were primarily conducted through textbooks, class lectures, and exercises. Then, the advent of AI has found a new way of acquiring English grammar. Artificial Intelligence-driven technologies such as grammar checkers, intelligent tutoring systems, and language learning software are becoming increasingly advanced and widespread.

Despite the probable power of AI, the efficacy of learning English grammar with AI is not generally experienced by all learners. The learning process is influenced by various factors such as learning environment, social and pedagogical factors, individual discipline, and self-study. This paper aims to comprehensively explore the multifaceted factors that influence the effectiveness of students' English grammar learning when utilizing AI tools at the University of Labour and Social Affairs (Campus 2) (ULSA2). The English syllabus for ULSA2 students is oriented towards the TOEIC test; thus, grammar learning is vital to support students in achieving high scores in all skills. Besides the traditional learning periods with the teacher at university, students are instructed to apply AI tools, such as ChatGPT and the Duolingo application, to learn grammar points and complete grammar exercises at home. This paper will investigate the relationship of the above factors with students’ English grammar learning effectiveness, providing a holistic view of the challenges and opportunities that arise in this learning context.

The following sections of this paper provide some information related to the effectiveness of AI tools in English grammar learning. After that, an analysis of environmental and social factors, individual discipline, and self-study will be presented. Then, a section of discussion will illustrate the connections between these factors and students’ grammar learning through AI tools. Finally, some practical recommendations are also drawn from the analysis, opening up new directions for future research.

Research questions:

1. What effectiveness can the students get from using AI tools - ChatGPT and Duolingo, in learning grammar?

2. What are students’ opinions on motivation and self-management when using ChatGPT and Duolingo for grammar learning?

3. What is the role of teachers in the students’ learning grammar process through AI tools?

2. Literature Review

2.1. Benefits of AI tools for grammar acquisition

Insert your new paragraph here. Different research shows that AI software performs well in acquiring grammar. Research indicates a significant difference in performance in grammar, especially among non-English major students, who achieve an average gain of 15%. For English major students, there is some improvement, though 5% (Lalira et al., 2024).

AI tools promote engagement and motivate learners through interactive, adaptive, and game-like learning experiences (States, 2025). Various studies have testified that there exists a high degree of correlation between the personalization strength of AI and effective learning outcomes (Gligorea et al., 2023; Taylor et al., 2021; Strielkowski et al., 2024). AI packages providing "personalized feedback", "adaptive guidance", "customized support", and "personalized learning paths" are also a huge plus. It was also discovered that this adaptive and personalized feedback decreased external cognitive load, aided in cognitive processing, and enhanced performance (Maier & Klotz, 2022). Additionally, AI supports independent learning by effectively addressing individual knowledge gaps, enabling learners to focus on areas that need the most practice (Saaida, 2023).

The initial AI grammar software, such as Grammarly, LanguageTool, and ProWritingAid, was created essentially for detecting and correcting errors, paraphrasing, and proposing stylistic enhancements (10 Best AI Grammar Check Tools in 2025 | Wordvice AI, 2025).

However, since the introduction of tools like GrammarTrack, Duolingo, Promova, and Squirrel AI, which extend beyond error correction, these tools also include individualized lessons, adaptive learning pathways, gamification, practice conversations, and overall progress tracking. It means that AI is now moving from being a simple device for error checking to an end-to-end interactive and adaptive learning system. The effectiveness of AI in teaching grammar is increasingly closely linked to its ability to provide an end-to-end, customized, and engaging experience, rather than simply correcting one. This opens up new directions for future research, and educators should strive to create more dynamic and innovative teaching programs by incorporating AI applications into traditional teaching methods.

***2.2. Initial concerns about the use of AI tools***

Though numerous studies have concluded that deriving benefit from using AI, no assurance is found in utilizing AI software to learn grammar. There is a concern about learners’ excessive dependence on technology, resulting in diminished autonomy, problem-solving skills, and critical thinking to acquire and implement grammar in solving exercises after learning with AI (Zhai et al., 2024). The question is whether the students are really learning while utilizing AI or merely waiting for AI responses without understanding the fundamentals.

Therefore, the adoption of AI is also challenging for instructors. It should be carried out with the proper strategy by the instructors, which combines AI technologies with traditional methodology to provide higher conceptual knowledge and self-evaluation over critical thinking.

***2.3. Social Factors affecting***

Although AI technology has numerous advantages, it is impossible for it to retain the human interaction (Thippanna et al., 2023). Teachers provide contextual sense-making, emotional support, and situational direction that AI does not (Collie & Martin, 2024). AI tools provide the possibility of selecting an English-speaking accent such as British-English, American-English, Singaporean-English, etc., which is a plus in the use of AI for language acquisition. However, first-hand interaction with native speakers and first-hand interaction with cultural environments must be experienced to gain true language proficiency in addition to sentence form correctness (Meryem Karlık, 2023). In other words, AI is an add-on but never a replacement for human interaction.

***2.4. Flexible learning environment***

Flexible spaces are created to fit time, space, function, and organizational requirements, supporting different teaching techniques and group sizes. At the same time, AI technology allows increased access, allowing students to look for materials and develop skills at any time, anywhere, beyond the constraints of traditional classroom design.

The impact of personal and friendly learning spaces promotes students' motivation. Human-like, AI-powered lesson plans give students the option to make personalized schedules, integrating their own schedules and learning patterns. This adaptability lessens anxiety and helps develop an acceptable learning environment (Raza & Iqbal, 2023). Freely doing exercises with game-like designs on phones also motivates young students, making language learning a fun adventure trip (Raza & Iqbal, 2023). Learners in a personalized learning environment are more self-assured and have better attitudes towards learning (Taylor et al., 2021).

Adaptive learning environments reduce stress and improve a positive learning atmosphere (Neilson & Dr. Jovertlee C. Pudan, EnP, 2024). Adaptive, interactive, and dynamic online learning experiences improve the learning environment's engagement and participation (Singh et al., 2023).

***2.5. Role of student discipline and self-directed learning (SDL)***

The concept of self-directed learning (SDL), which describes how students manage their own education, has been widely studied in the field of education. SDL highlights the active role of students in shaping their educational experiences by allowing them to take personal responsibility and collaborative control over their cognitive processes (also known as self-monitoring) and context (self-management), according to researcher Garrison (1997).

Student self-regulation and discipline are key individual determinants of learning grammar efficiency using AI-supported methods. AI-supported technology greatly improves language learning performance through increased learner motivation, immediate feedback, and individualized learning (Lalira et al., 2024; Ling, 2023).

3. Methodology

The study used a sequential explanation mixed design research process according to Creswell & Plano Clark, (2017) to assess how undergraduate students use ChatGPT to support doing grammar homework and self-study grammar via the Doulingo application and how these tools affect the development of their self-study ability at the University of Labor and Social Affairs, Campus 2 (ULSA2). The study provides observations of students' behavior and explains their subjective experiences by basing them on two phases.

***3.1 Participants***

68 non-English major sophomores participated in the quantitative phase, with an online survey, while, in the qualitative phase, five students were purposively selected for interviews based on their willingness to share their thoughts.

***3.2 Instrument***

The survey contained 20 items on ChatGPT and Duolingo usage, motivation, self-management, self-monitoring, and perceived impact. On a 5-point Likert scale, these items achieved an acceptable level of internal consistency.

***3.3 Procedure***

The survey was uploaded to Google Forms in May 2025. After preliminary analysis, selected participants were sent an invitation to interview. The interviews were set to last approximately 10-15 minutes and were conducted face-to-face. The interviews consisted of five open-ended questions, including students’ grammar learning effectiveness, strategies, changes in motivation, and teachers’ role in English grammar learning.

***3.4 Data Analysis***

Quantitative data were analyzed using Excel. Thematic analysis of qualitative interview transcripts was conducted using an inductive and deductive approach related to the SDL aspects proposed by Garrison.

 4. Results

**Table 1**

*The effectiveness that students get from using AI tools in learning grammar*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Questions** | **1** | **2** | **3** | **4** | **5** |
| 1 | You think ChatGPT/Duolingo’s answers are easy to understand. | 14.7% | 47.1% | 26.5% | 8.8% | 2.9% |
| 2 | You remember how to use a grammar point after asking ChatGPT. | 11.8% | 47.1% | 35.3% | 0.0% | 5.9% |
| 3 | You use ChatGPT and Duolingo because the applications use native speakers’ voices | 20.6% | 64.7% | 11.8% | 0.0% | 2.9% |
| 4 | You think Duolingo’s exercises are suitable with your level. | 32.4% | 41.2% | 11.8% | 8.8% | 2.9% |
| 5 | You felt comfortable when learning with AI tools. | 17.6% | 64.7% | 11.8% | 2.9% | 2.9% |
| 6 | You like ChatGPT and Duolingo to learn grammar because you can study anytime and anywhere. | 11.8% | 55.9% | 14.7% | 14.7% | 2.9% |
| 7 | You find learning grammar through ChatGPT and Duolingo effective.” | 8.8% | 44.1% | 38.2% | 2.9% | 5.9% |

\* No. = Number

1 = Strongly agree 2 = Agree 3 = Undecided 4 = Disagree 5 = Strongly disagree

As seen in Table 1, the participants’ responses showed that when learning grammar through ChatGPT and Duolingo, many learners found it easy to understand with detailed information (61.8%), while 26.4% of learners were undecided. Similarly, for the item “You remember how to use a grammar point after asking ChatGPT”, the majority of learners agreed and strongly agreed (58.8%), while undecided learners accounted for 35.3%. In addition, the question “You use ChatGPT and Duolingo because the applications use native speakers’ voices” accounted for 85.2% of agreeing and strongly agreeing responses from learners at ULSA2. Next is the item “You like ChatGPT and Duolingo to learn grammar because you can study anytime and anywhere”, which got 67.7% with agreement and strong agreement. The last item “You find learning grammar through ChatGPT and Duolingo effective.” with 52.9% agreeing and strongly agreeing responses and 38.2% undecided.

**Table 2**

*Factors that motivate the use of ChatGPT and Duolingo in grammar learning*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Questions** | **1** | **2** | **3** | **4** | **5** |
| 1 | Duolingo makes you excited about learning.” | 29.4% | 50.0% | 14.7% | 2.9% | 2.9% |
| 2 | You continued to study because the application reminded you to study. | 20.6% | 50.0% | 11.8% | 11.8% | 5.9% |
| 3 | You used AI to learn because of your teacher’s reminders. | 8.8% | 20.6% | 23.5% | 35.3% | 8.8% |
| 4 | You learn with AI because of the requirement of the course. | 2.9% | 38.2% | 20.6% | 17.6% | 20.6% |
| 5 | You keep learning English grammar with ChatGPT and Duolingo in the future. | 17.6% | 41.2% | 29.4% | 5.9% | 5.9% |

\* No. = Number

1 = Strongly agree 2 = Agree 3 = Undecided 4 = Disagree 5 = Strongly disagree

In Table 2, the participants’ responses showed the motivation for using ChatGPT during grammar learning. The most highly rated item is “Duolingo makes you excited about learning.” with 79.4%. Next is the item "You continued to study because the application reminds you to study.", with 70.6% showing that this tool brings emotional comfort and motivates the grammar learning process. Meanwhile, for external factors such as course requirements to get grades, there is an equal number of students choosing to agree and strongly agree, 41.2%, undecided, 23.5% and disagree and strongly disagree, 38.2%. Only 23.5% agree to study with AI because of the teacher’s reminders, while the majority is self-motivated, 44.1%. And many students choose to continue learning grammar through the Duolingo and ChatGPT applications, with 58.8% answering " You keep learning English grammar with ChatGPT and Duolingo in the future."

**Table 3**

*Factors that motivate the use of ChatGPT and Duolingo in grammar learning*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Questions** | **1** | **2** | **3** | **4** | **5** |
| 1 | You think you can learn grammar yourself through ChatGPT and Duolingo. | 8.8% | 58.8% | 14.7% | 14.7% | 2.9% |
| 2 | You delayed studying because you focused on other applications | 8.8% | 35.3% | 38.2% | 14.7% | 2.9% |
| 3 | You made a learning schedule with AI. | 5.9% | 32.4% | 38.2% | 17.6% | 5.9% |
| 4 | You relied on ChatGPT when doing grammar exercises. | 11.8% | 23.5% | 35.3% | 26.5% | 2.9% |
| 5 | You lose focus on studying because of other entertainment applications on your phone | 17.6% | 41.2% | 17.6% | 14.7% | 8.8% |

\* No. = Number

1 = Strongly agree 2 = Agree 3 = Undecided 4 = Disagree 5 = Strongly disagree

In Table 3, 67.6% of the participants agreed and strongly agreed that “You can learn grammar by yourself through ChatGPT and Duolingo”. In addition, learning is also affected by interesting temptations from social networks and entertainment games on the phone. “You lose focus on studying because of other entertainment applications on the phone” accounted for 58.8%. Interestingly, the statement “You relied on ChatGPT when doing grammar exercises” was only 35.3%, indicating that students appreciated the support of ChatGPT but did not rely entirely on it in learning grammar. Additionally, many of them lacked a serious plan to study grammar through AI tools; just 38.3% did. The findings suggest that students’ intrinsic motivation is a stronger motivator than external influences and teachers.

**Table 4**

*Role of the teachers in English grammar classes through AI*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Questions** | **1** | **2** | **3** | **4** | **5** |
| 1 | You find AI explanations are easier to understand than the teacher’s.” | 2.9% | 17.6% | 17.6% | 38.2% | 23.5% |
| 2 | You prefer interacting with AI to interacting with teachers. | 2.9% | 8.8% | 29.4% | 35.3% | 20.6% |
| 3 | You find learning grammar through AI more effective than learning with a human teacher. | 5.9% | 8.8% | 23.5% | 32.4% | 29.4% |

\* No. = Number

1 = Strongly agree 2 = Agree 3 = Undecided 4 = Disagree 5 = Strongly disagree

As shown in Table 4, “You find AI explanations are easier to understand than the teacher’s.” accounted for 61.7% disagree and strongly disagree. In addition, “You prefer interacting with AI to interacting with teachers” did not receive much support, and the majority chose interacting with teachers, accounting for 55.9%. Finally, 61.7% of the participants surprised the author with disagree and strongly disagree choices about the position of teachers in the era of AI technology development, “You find learning grammar through AI more effective than learning with a human teacher”, and 26.5% are still undecided.

**Interview Results**

To supplement the quantitative findings from the survey on university students’ use of ChatGPT in learning grammar, follow-up interviews were conducted with five students from ULSA2. These interviews aimed to explore how ChatGPT influenced students’ improvement in grammar learning, students’ motivation, self-management strategies, self-monitoring practices, and the role of teachers in students’ AI-assisted grammar learning.

The interview protocol included ten open-ended questions about students’ usage patterns, methods of evaluating AI-generated suggestions, challenges encountered, and concerns about using ChatGPT. Each interview lasted approximately 10-15 minutes and was conducted face-to-face. The transcripts were analyzed using thematic coding in line with Garrison’s (1997) Self-Directed Learning (SDL) Model and emerging themes from the integration of ChatGPT.

***The effectiveness of English grammar learning through AI tools***

Most of the students’ responses showed that using ChatGPT and Duolingo to learn grammar is effective, but also has disadvantages.

AI’s answers sometimes were easy to understand, but some made me confused. Learning through AI gave me feedback quickly but also made me lazy to think. I like using AI because I can interact with it at any time, anywhere and practice with a native accent while at my university, interacting and practicing pronunciation with native speakers is very rare.”(Participant 1)

I find that learning with AI brings many obvious benefits such as: accessing knowledge quickly at any time, anywhere in terms of space or time. Applications can give quick and easy-to-understand feedback - something that traditional classrooms are limited in. (Participant 2)

I find that learning with AI saves time on travel and class costs. AI can help us practice pronunciation, listening, reading, and vocabulary effectively. The practice feature on the Duolingo app impressed me when AI listens to my pronunciation and only moves to the next question after it is correct. I am satisfied with using AI to support because I want to practice pronunciation like a native speaker. (Participant 3)

In my opinion, learning with AI has the advantage of quickly responding to answers, but the disadvantage is that correct/incorrect answers need to be verified. (Participant 4)

AI helps me learn English very effectively, specifically correcting grammar and pronunciation, and learning vocabulary. AI provides a wide range of resources and comes with reference websites. (Participant 5)

***Motivation and self-study awareness***

Most opinions point out that ChatGPT and Duolingo can help students learn grammar by themselves, but students are not determined enough to fight other temptations on their phones to focus on self-study.

I feel comfortable studying with AI. Duolingo has a study mode to remind me, without any pressure; that is also the reason why I lack discipline, since no one is supervising and reminding me. When studying with a teacher, I am required to think carefully before asking questions, which sometimes is quite stressful, and the teacher cannot answer each student in the class in a short time. (Participant 1)

In addition, AI can personalize each person's level, according to their plan. However, learning through AI also has disadvantages, such as being easily distracted by other applications on the phone, or learners easily become dependent on AI and lack discipline because there is no supervision. Therefore, I have to be determined. (Participant 2)

Using AI freely makes us distracted by other applications on the phone, and it is not as effective as learning in class. Regarding the Duolingo application, Duolingo is effective in identifying the learner's ability and providing appropriate exercises, vocabulary, and grammar. Besides, Duolingo creates positive encouragements (determining rankings on the leaderboard). (Participant 3)

I will continue to use AI to support my learning because I can search for information quickly. AI can be used to support me when there is no teacher. (Participant 5)

***The importance of teachers in the classroom***

The comments from the students surprised me because every answer supported the vital position of teachers in the classroom, which AI cannot replace.

AI is like a teacher, but when studying with a teacher, the teacher can recognize which parts I do not understand and explain them again, while AI cannot do that well. Currently, I still learn more through books because I find the sources of books reliable and require me to think more critically.(Participant 1)

The best way is to combine AI and traditional teachers. AI supports practice and practice, while teachers play the role of guiding, explaining in depth and inspiring. (Participant 2)

But to communicate effectively and to answer some questions that AI cannot, teachers are still needed. (Participant 3)

Most teachers have been trained properly, so their knowledge is more standard. I prefer to study with teachers because teachers give practical examples that better meet my understanding than AI. I only use AI as a support tool. (Participant 4)

AI can be used to support me when I am not at school, but it cannot replace a teacher. (Participant 5)

5. Discussion

The study findings reveal that the application of ChatGPT and Duolingo utilized by ULSA2 students for learning English grammar has significant effects. Therefore, this discovery is upheld by previous research, as according to these findings, ChatGPT can be said to be a suitable thinking platform, and it is easy to learn the complexity of rules in grammar and receive instant and quick feedback (Gligorea et al., 2023; Taylor et al., 2021; Strielkowski et al., 2024). In the course of questionnaire responses and interviews, students at ULSA2 discovered that ChatGPT and Duolingo can improve their grammar, native-like AI pronunciation practice, and vocabulary development. They are more confident and at ease in carrying out learning activities in a flexible learning setting. However, this study also identified key drawbacks such as the possibility of students overdepending on AI tools and losing their ability to think critically.

In the learner interview feedback, students can access study materials at any time and from anywhere, which is also in line with the previous studies (Raza & Iqbal, 2023; Neilson & Dr. Jovertlee C. Pudan, EnP, 2024; Singh et al., 2023).

AI-based English grammar learning software is a multi-faceted aspect with various determinants such as technological determinants, social determinants, and intrinsic motivation. Each of the determinants does not work in isolation but affects and is affected by the others. Duolingo can make a personalized learning plan, motivate learners to study every day by sending notifications, motivate learners by encouragement, build learning paths, and make learners comfortable as if they are playing a game. However, since the learning environment is flexible, learners are distracted by other apps and social media on their smartphones.

In addition, although AI can fulfill syntax, it cannot replicate the cultural and emotional contexts of human interactions. In this study, the students proved that learning with and communicating via AI is only a supplementary tool for learning because teachers still play a vital role in interacting, inspiring, and motivating students (Collie & Martin, 2024). AI can respond very quickly, but it cannot recognize the learners' feelings of satisfaction or confusion.

This study has always given significant priority to the fundamental benefits of AI in reinforcing grammatical accuracy, stimulating student participation, and providing personalized learning opportunities. The study also identifies fundamental limitations, such as the risk of overreliance, diminishing critical thinking, and inhuman interactions. This requires a subtle balance in which AI is viewed as an add-on tool rather than a complete alternative to human instructors or actual human contact.

It is clear that the students are highly responsible for their own learning, as evidenced by the 58.9% who strongly agree/agree and 32.3% who are unsure to keep practicing grammar with AI and manage distractions 58.9%. The results also show evidence that AI-assisted learning has the ability to encourage learner discipline and self-regulation (Lalira et al., 2024; Ling, 2023). However, the time management ability was weaker since only 38.2% aimed to learn from AI following a schedule. This means that they had poor time management skills when learning with ChatGPT and Duolingo.

Overall, students viewed AI as a tool to support rather than a substitute for teachers, demonstrating that learning is an interaction that Garrison (1997) describes as a dual dynamic between intrinsic initiation and teacher-directed support.

6. Conclusion

This study investigated the results of the English grammar learning process through AI tools of ULSA2 sophomores. Overall, students found ChatGPT and Duolingo useful in helping them with quick and detailed answers. Students confirmed that they had such high levels of intrinsic motivation to continue learning through AI tools, as the majority agreed to keep going and show their attempts to overcome distractions from digital devices. Such situations mark the emergence of self-management skills, which are fundamental to SDL. However, the study specifically identified student issues, such as self-monitoring. For example, most learners appear to be less engaged in reviewing AI-generated content, reflecting on their learning. This suggests that the metacognitive aspect of SDL is still lacking. Furthermore, the feeling of over-reliance on ChatGPT seems to require more intentional use, fostering independence rather than encouraging passivity.

This study provides recommendations for institutions, teachers, and learners to ensure that tools such as ChatGPT or Duolingo, will promote, rather than hinder the academic growth. Reaffirming the important and necessary role of human teachers in guiding, inspiring, authentically interacting, and providing accurate and in-depth knowledge to learners.

 Therefore, organizations should take the lead in embedding AI knowledge into their curricula on ethics, rapid design, and source verification. They should also create space for staff professional development around the teaching capabilities of AI and outline the ethical use of generative AI.

To teachers, rules should be established for the use of AI to avoid students depending on and using AI to cheat, be dishonest and unfair to others. Teachers design lessons that focus on the learning process, encouraging students to think and debate by asking questions to test and evaluate students' understanding. Teachers should also take advantage of the convenience of AI in the teaching and learning process to increase free time for communication between teachers and students.

Ultimately, students will be encouraged to use ChatGPT strategically, with clear goals in mind. They need to be able to demonstrate critical thinking, such as seeking information from different sources and selecting information that is relevant to their own situation in order to develop sustainable self-directed learning.

In the future, some areas need research to understand the long-term ramifications of AI in learning English grammar: sustained retention of grammatical abilities acquired through AI tools, as opposed to the short-term benefit demonstrated in current research.

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**Bionote**

**Truong Thi Tham** is an English lecturer at the University of Labour and Social Affairs Campus 2, Ho Chi Minh City. She has been working as a lecturer for over ten years. During her teaching time, she has had numerous opportunities to approach innovative teaching and learning methods through the papers of experienced researchers from around the world. She has written research papers for her university’s workshops as well, in an attempt to find the best way to teach her students.