



University students' perceptions of artificial intelligence-based tools for English writing courses

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ABSTRACT

This research explores the perceptions of Korean university students regarding artificial intelligence (AI)-based writing tools that include tools guided by machine learning, such as Google Translate and Naver Papago, and generative AI tools, such as Grammarly. A mixed methodology was used, including both quantitative and qualitative data. Among students who have taken English writing courses, 80 Korean university students volunteered for the online survey. After the survey, the research team recruited interview participants, and five volunteered participants joined the focus group interview. The study results indicate that these AI-based writing tools could improve English language learners (ELLs) writing skills. ELLs also noted the strengths and weaknesses of each AI-based tool, including the accessibility of translation machine learning and the error-checking capabilities of generative AI. However, interview data analysis indicates that the excessive use of AI-based writing tools could interfere with ELLs' English writing process. This study highlights the need to effectively integrate AI-based tools in English language teaching for adult ELLs worldwide.

Keywords: AI, AI-based writing tools, machine translation, generative AI, Naver Papago, Google Translate, Grammarly

INTRODUCTION

The 21st century has witnessed the rise of artificial intelligence (AI) in foreign language education, which uses AI to simulate students' language learning. One example is online machine translation (MT) as a quick solution for English language learners (ELLs) encountering English writing difficulties (Bahri & Mahadi, 2016; Stapleton & Kin, 2019). However, opinions on the effectiveness of automated AI programs in foreign language education are still divided (Briggs, 2018; Qassemzadeh & Soleimani, 2016). While some studies have reported serious errors in direct translations that do not match the context as limitations, others have shown their potential in English language teaching (ELT) courses to check the fluency of expression and grammar for L2 writing (Beiler & Dewilde, 2020; Tsai, 2019).

Machine learning translation tools are the most accessible types available due to their free access. The largest number of users worldwide uses Google Translate (GT) and operates with a vast data collection network and one of the largest cloud servers. Since 2016, deep learning technology has been applied based on artificial neural networks to identify the context and show detailed translations in sentence units, increasing translation accuracy (Tsai, 2019). Therefore, GT receives attention from ELLs and instructors.

Although GT is often the most used language translator, other alternatives are available for language translation. Naver Papago (NP), released by the Korean company Naver in 2016, is a translation tool developed through AI neural networks. It specializes in translating Korean to other languages. Grammarly is another AI-based tool encompassing more expansive components than typical machine learning applications. Grammarly is a widely used, cross-platform, cloud-based writing app that reviews spelling, grammar, punctuation, clarity, engagement, and delivery mistakes. It allows users to match their style, accent, and context-related language. The difference between NP/GT and Grammarly is that NP/GT uses MT from one language to another. In contrast, Grammarly uses a generative AI engine to specifically help with English writing and style. These two types of tools are used by learners differently based on the purpose of English writing (Kim & Han, 2021).

Previous studies showed that AI translators can be a learning aid, allowing ELT educators to provide individual feedback to ELLs. AI translation tools have been positively evaluated regarding the effectiveness and satisfaction they bring to ELT (Ahn & Chung, 2020; Chon et al., 2021). However, previous studies have yet to explore AI-based application tools for diverse ELT contexts. Understanding these AI-based tools' impact and potential pitfalls is important for ELT educators to beneficially incorporate them into instruction (Ahn & Chung, 2020; Chon et al., 2021). This paper explores Korean university students' perceptions of using GT/NP (machine learning-based) and Grammarly (generative AI-based) in liberal arts English classes. This research explores the current uses of AI-based tools by ELLs, demonstrates the potential effects AI-based tools can have on future ELT environments, and presents ways to use these tools more effectively for English writing education in higher education.

LITERATURE REVIEW

AI-Based Translation on ELT & ELLs

With cutting-edge technology development, ELT classes incorporating technology are effective when implemented in English writing education (Kim & Song, 2012). Recent research has shown that AI-based automated tools could provide more in-depth, useful feedback than other programs (Briggs, 2018; Qassemzadeh & Soleimani, 2016). Thus, it is crucial to understand their impact on university students' second language acquisition. For instance, Stapleton and Kin (2019) reported that composition using a machine learning AI translator is more accurate and has a higher learning effect on vocabulary and grammar than on learners without assistance. In another study, Lee (2020) investigated the types of errors in English writing and the usefulness of using NP and GT with high school students. The analysis reported that MT in an EFL environment is useful and effective for mapping English composition.

Previous studies have also found that integrating AI-based tools can significantly impact university students' English writing without hampering their language development (Gayed et al., 2022; Klekovkina & Denié-Higney, 2022). According to O'Neill and Russell's (2019) study, university students found Grammarly easy to use and useful, responding positively to the program's grammar feedback. Qassemzadeh and Soleimani (2016) found that university students who received sentence structure feedback from AI-based programs rather than the instructors remembered the passivity of English grammar rules. Reis and Huijser's (2016) study also showed that Grammarly provided more in-depth feedback and useful functions for English writing.

Regarding the benefits of automated AI feedback programs on Korean ELLs for university settings (Im, 2017; Lee, 2020; Lee & Briggs, 2021), Briggs (2018) found that about 50.00% of Korean ELLs thought online MT was valuable as a language learning tool. Jeong's (2021) study also showed that ELLs' English writing skills improved when using automatic translators, such as GT and NP, and they felt comfortable using them. Lee's (2019) study examined the role of GT in improving L2 writing and establishing writing strategies for university ELLs. The results showed that using GT reduced grammar errors and positively affected English writing strategies. Furthermore, most university ELLs used automatic translators for English learning, which helped with vocabulary, grammar, and expression in their English composition correction.

Regarding AI-based tools on ELLs' perceptions, Chen et al. (2023) conducted a study to explore how individuals learning a second language perceive the potential of Google Assistant (GA) at different proficiency

levels. The study involved 29 college students learning English as a foreign language, who were asked to use various voice commands with GA for an hour. Participants reported that they enjoyed interacting with GA and found it an inspiring tool for language learning, particularly for improving their speaking and listening skills. They also noted that GA's pronunciation was natural and easily comprehensible. However, lower-level learners experienced more challenges due to mispronunciations, while higher-level learners achieved better mutual comprehensibility with GA. The study provides insights into the potential of IPA-assisted L2 learning and offers suggestions for future research directions and pedagogical approaches.

In their 2023 study, Tao and Zou (2023) examined how Chinese students perceive Kahoot! in classroom teaching. The goal was to determine if games can benefit learning and how they function. The study included 80 freshman students from an international university in mainland China who completed an anonymous questionnaire. Thirteen students also had the opportunity to participate in a face-to-face interview. The results indicated that Kahoot was viewed as a helpful game-based application that could improve learning motivation, engagement, effectiveness, and interaction. This finding suggests that teachers use Kahoot to support learners' EFL learning. The findings of this study have implications not only for teaching in the Chinese higher education context but also in other situations, where learners may be more passive in their approach to learning.

Fithriani (2023) conducted a phenomenological case study to explore how students perceive QuillBot's use in an EFL academic writing course. The study involved 20 sixth-semester students majoring in English Education as participants. Data was collected through an online questionnaire, distributed to all participants, and face-to-face interviews with five selected participants based on their responses. The results showed that students were positive toward using QuillBot in academic writing. They found it beneficial for three reasons: improving content or argument, minimizing grammatical errors, and enhancing language usage in their manuscripts. By integrating AI technology, such as online paraphrasing tools, EFL students can overcome writing difficulties and improve their writing products. Using AI-based technology in language classrooms can be advantageous in different ways. However, further research is needed to determine the importance of each element concerning students' use of AI-based paraphrasing tools, particularly QuillBot.

Lastly, Huang et al. (2023) utilized bibliometric analysis to examine the integration of AI in language education. Their review of 516 papers published between 2000 and 2019 found a growing prevalence of studies on AI-enhanced language education. The research showed that AI was commonly employed to support students in developing writing, reading, vocabulary, grammar, speaking, and listening skills. Automated writing evaluation, personalized learning, and intelligent tutoring systems were developed using natural language processing, automated speech recognition, and learner profiling techniques.

To summarize, it is important to consider the effects of AI-based tools on ELL use and the impact these tools have on ELT and reflect on how to use them effectively (Lee & Briggs, 2021; Murtisari et al., 2019; Yoon & Chon, 2022). This paper explores Korean university students' attitudes and perceptions of using GT/NP and Grammarly in liberal arts English classes. The research questions are, as follows:

1. How do Korean university students perceive using AI-based tools in liberal arts English classes?
2. What are the advantages and disadvantages of using AI-based tools in liberal arts English classes?

METHODOLOGY

This study was conducted at a university in Korea. The data collection period is September 2 to October 10 during the 2023 Fall semester. The study participants were 80 Korean university students taking general English as a mandatory liberal arts course. **Table 1** shows the survey participants' grades, gender, and self-report of English scores. The survey participants comprised 34 male participants and 46 female participants. Most respondents were sophomores, 55 individuals (68.80%), followed by 15 juniors (18.00%), and five participants each (12.50%) for the freshmen and senior cohorts.

Over half of the student participants self-assessed their English writing proficiency as being at the beginner level (n=44, 55.00%). In comparison, 27 students (33.80%) considered their writing skills intermediate, and only nine (11.30%) believed they possessed advanced writing capabilities. Among those surveyed, 17 students had prior experience taking the TOEIC test, with an average score of 758.82 out of 990.

Table 1. Demographic data of survey participants

Category		n	Percentage (%)
Gender	Male	34	42.5
	Female	46	57.5
Grade	Freshmen	5	6.3
	Sophomores	55	68.8
	Juniors	15	18.8
	Seniors	5	6.3
Self-reported writing ability	Beginner	44	55.0
	Intermediate	27	33.8
	Advanced	9	11.3
TOEIC test score		17	Average: 758.82

Table 2. Interview participant

Category	Student 1	Student 2	Student 3	Student 4	Student 5
Gender	Female	Male	Female	Male	Male
Major	Arts & performance	Business	Business	History	Science & engineering
Self-reported English proficiency levels	Intermediate	Intermediate	Intermediate	Beginner	Advanced
TOEIC scores	750-800	Below 600	750-800	Below 600	Over 900

The survey questions were implemented by previous studies related to this topic. Survey questions were implemented by Kim and Han's (2021) research about university students' perceptions of AI-based writing tools. The initial set of questions explored the efficacy of AI writing tools to enhance English composition skills, such as: 'the incorporation of GT/NP has enhanced my English writing,' and 'the utilization of Grammarly has promoted my English writing,' Study participants were prompted to express their agreement or disagreement concerning the effectiveness of each AI-based writing tool, selecting responses on a 5-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agreed' (5). Subsequently, the survey presented multiple-choice questions about the most pronounced benefits and drawbacks of GT/NP and Grammarly. Participants were encouraged to articulate each tool's most significant pros and cons identified through their engagement with English writing assignments.

In terms of data analysis, this study conducted an analysis of variance (ANOVA) analysis to explore the perceptions of Korean students toward AI-based English writing tools. Before conducting ANOVA analysis, Levene's Test verified the homogeneity of variances. The results indicated that the variances of the verified data were homogeneous ($F[2, 77]=.945, p>.05$; $F[2, 77]=.757, p>.05$), allowing ANOVA analysis to proceed. After the survey, researchers recruited focus-group interview participants to understand their perceptions of AI-based writing tools, including three platforms. The interview was conducted via Zoom, and there was no monetary compensation. All participation was voluntary, and the interview lasted for an hour. The interview data was analyzed by thematic analysis (Castleberry & Nolen, 2018).

Thematic analysis is a widely used technique in qualitative research for analyzing data. This approach involves recognizing, analyzing, and reporting patterns (themes) within the data. It is particularly useful in studies aiming to comprehend people's perceptions, experiences, and viewpoints. The initial step is for the research team to read and re-read the data to understand its contents thoroughly. The second step involves coding the data, which requires identifying a data feature and assigning a label (code) to convey its essence. The third step is for the research team to search for patterns or themes in the coded data. The subsequent step involves verifying whether the themes apply to the coded extracts and the entire data set. The final step is to ensure that each theme is refined and clearly defined, which entails identifying the 'essence' of each theme and determining what aspect of the data each theme captures. **Table 2** shows interview participants

SURVEY RESULTS

Understanding Effects of GT/NP & Grammarly

The results from analyzing the perceived impacts of GT/NP and Grammarly are presented in tables.

Table 3. Preference for AI-based English writing tools

Category	n	Percentage (%)
GT/NP	60	75.1
Grammarly	11	13.8
Using all of three	9	11.3

Table 4. Understanding effectiveness of AI-based English writing tools

Question	Mean	Standard deviation
Use of Google Translate or Naver Papago helped my English writing learning	3.71	.944
Use of Grammarly helped my English writing learning	2.84	1.119

Table 5. Analysis of perception of AI-based English writing based on self-reported writing ability

Category	Self-reported writing ability	Mean	Standard deviation	F	p
Use of Google Translate or Naver Papago helped my English writing learning	Beginner	3.57	.925	1.936	.151
	Intermediate	3.78	.892		
	Advanced	4.22	1.093		
Use of Grammarly helped my English writing learning	Beginner	2.71	1.069	.925	.401
	Intermediate	2.93	1.072		
	Advanced	3.22	1.481		

As seen in **Table 3**, most of the students (60 participants or 75.10%) preferred utilizing GT/NP, showing they preferred these tools for English writing. Conversely, 11 students, equivalent to 13.80% of the sample, preferred Grammarly as a more efficient alternative. Only nine students, representing 11.10%, used all these tools to acknowledge the effectiveness in facilitating English writing proficiency. These results showed different preferences based on each tool's functions, especially for students who used MT tools such as GT/NP. Students used these tools to translate from Korean to English. In contrast, students used the generative AI engine Grammarly to help more with their written English writing and style.

The survey responses regarding the impact of AI-based tools on their English writing proficiency are shown in **Table 4**. The students rated the effectiveness of GT or NP with a mean score of 3.71 and a standard deviation of 0.944. In contrast, Grammarly received a mean score of 2.84 with a standard deviation of 1.119 for its contribution to their English writing learning. ANOVA test results indicated that GT or NP was more effective than Grammarly in helping with English writing ($F=28.59, p<0.0001$).

Table 5 provides university students' perceptions of AI-based writing tools based on their English proficiency levels. For those utilizing GT or NP in their English writing, a positive correlation is observed between the students' English proficiency levels and their appraisal of the tools. Specifically, the average scores given by beginners, intermediates, and advanced ELLs were 3.57 (standard deviation [SD]=.925), 3.78 (SD=.892), and 4.22 (SD=1.093), respectively. Nevertheless, ANOVA test results reveal no statistically significant differences across groups ($F=1.936, p=.151$).

A similar pattern is found in the case of Grammarly. As the students' English writing proficiency advances, their ratings of Grammarly's effectiveness in aiding their writing learning experience also tend to improve, with average scores of 2.71 (SD=1.069), 2.93 (SD=1.072), and 3.22 (SD=1.481) reported by beginners, intermediates, and advanced ELLs, respectively. These results indicate a trend of increasingly positive views towards Grammarly with advanced English proficiency levels. ANOVA test results revealed no statistically significant differences across groups ($F=0.925, p=.401$).

Strengths & Weakness of GT/NP & Grammarly

As shown in **Table 6** and **Table 7**, the results provide an in-depth analysis of the strengths and weaknesses of GT/NP and Grammarly. First, in the case of GT/NP, students predominantly preferred its user-friendliness, highlighting the ease of use as a significant benefit ($n=38, 47.50%$). GT or NP's ability to assist in error identification and correction ($n=30, 37.50%$), aiding the structuring of ideas and sentence formation. Many university students found it particularly advantageous for enhancing vocabulary ($n=17, 21.25%$), providing natural translations ($n=13, 16.25%$), using rich expressions ($n=13, 16.25%$), learning grammar ($n=11, 13.75%$), and overall English writing proficiency ($n=11, 13.75%$).

Table 6. Strengths & weaknesses of GT/NP

Category	n	Self-reported writing ability (%)			
		Beginner	Intermediate	Advanced	
Strength	Learning vocabulary	17	11 (64.7)	6 (35.3)	0 (0.0)
	Learning grammar	11	7 (63.6)	3 (27.3)	1 (9.1)
	Structuring ideas or writing sentences	24	10 (41.7)	11 (45.8)	3 (12.5)
	Translates writing naturally & perfectly	13	7 (53.8)	4 (30.8)	2 (15.4)
	Using good expressions	13	7 (53.8)	3 (23.1)	3 (23.1)
	Recognize or correct errors in writing	30	17 (56.7)	11 (36.7)	2 (6.7)
	English (writing) ability	11	6 (54.4)	3 (27.3)	2 (18.2)
	Have confidence in English writing	9	4 (44.4)	3 (33.3)	2 (22.2)
Weakness	Convenient (quick & easy) to use	38	20 (52.6)	16 (42.1)	2 (5.3)
	Shows vocabulary misuse	20	13 (65.0)	4 (20.0)	3 (15.0)
	Difficult to identify errors	31	17 (54.8)	10 (32.2)	4 (12.9)
	It does not translate accurately	26	15 (57.7)	6 (23.1)	5 (19.2)
	Shows unnatural expressions or grammar structures	32	15 (46.9)	12 (37.5)	5 (15.6)
	Does not improve English (writing) ability	24	11 (45.8)	12 (50.0)	1 (4.2)
	Depend on it too much	38	20 (52.6)	16 (42.1)	2 (5.3)

Table 7. Strengths & weaknesses of Grammarly

Category	n	Self-reported writing ability (%)			
		Beginner	Intermediate	Advanced	
Strength	Automated feedback is convenient	17	8 (47.1)	7 (41.2)	2 (11.8)
	Feedback offers natural expressions or structures	21	10 (47.6)	9 (42.9)	2 (9.5)
	More reliable than GT or NP	13	5 (38.5)	6 (46.2)	2 (15.4)
	It offers accurate suggestions	12	7 (58.3)	3 (25.0)	2 (16.7)
	It helps fix errors	14	4 (28.6)	6 (42.9)	4 (28.6)
	It helps identify errors	16	4 (25.0)	7 (43.8)	5 (31.3)
	Feedback with an explanation helps my learning	13	7 (53.8)	3 (23.1)	3 (23.1)
Weakness	Inconvenient to use	12	8 (66.7)	2 (16.7)	2 (16.7)
	Costs for using advanced functions	29	13 (44.8)	12 (41.4)	4 (13.8)
	It does not fix unnatural expressions or grammar structures accurately	10	6 (60.0)	2 (20.0)	2 (20.0)
	Does not offer sufficient feedback or explanation	10	5 (50.0)	4 (40.0)	1 (10.0)
	It does not improve my English (writing) ability	5	1 (20.0)	3 (60.0)	1 (20.0)
	Depend on it too much	16	9 (56.3)	4 (25.0)	3 (18.8)
	There is no weakness/I do not know	23	12 (52.2)	10 (43.5)	1 (4.3)

Second, regarding the limitations associated with GT/NP, many beginner and intermediate ELLs pinpointed issues about overdependence, with 38 (47.50%) students acknowledging this drawback. Also, 32 (40.00%) students highlighted the tool's tendency to generate unnatural grammar or expressions. Specifically, the results also showed that ELLs perceive GT/NP as challenging regarding error identification, with 31 (38.75%) students expressing this concern. Also, 26 (32.50%) students raised concerns about the tool's occasional use of incorrect words or vocabulary. In comparison, 24 (30.00%) students questioned its efficacy in fostering English writing skills, indicating a potential area of dependency without tangible skill development.

Third, many beginner and intermediate ELLs reported that Grammarly's feedback provided them with natural expressions or structures (n=19, 23.75%). They reported the convenience of the tool's automatic feedback feature (n=17, 21.25%). Additionally, Grammarly was acknowledged for its proficiency in error detection and correction, with 16 (20.00%) students highlighting its capacity to scrutinize and rectify mistakes and another 14 (17.50%) pointing out its correction capabilities. Thirteen students went a step further, advocating for Grammarly's descriptive feedback, emphasizing its potential to outperform GT/NP in terms of educational value. Additionally, 23 (28.75%) ELLs found no flaws in Grammarly or needed clarification about its potential drawbacks, suggesting a level of satisfaction or a lack of critical engagement with the tool. Fourth, ELLs reported some limitations of Grammarly. Twenty-nine students identified the cost associated with accessing advanced features as the primary disadvantage, shedding light on the financial barriers that could impede a user's full utilization of the tool.

However, there was a noteworthy concern regarding the potential for over-reliance on Grammarly by 16 students (20.00%). These results show an awareness amongst learners about the potential pitfalls of

depending too heavily on automated writing assistance tools and the importance of balancing tool use with personal skill development. These responses provide a perspective on Grammarly, illustrating its valued features and recognizing its limitations and potential risks associated with over-reliance.

INTERVIEW FINDINGS

Focus group interviews with five ELLs were conducted to understand more detailed thoughts and opinions on the above survey results. The interview results were analyzed, and the main topics emerged:

- (1) advantages of using AI-based English writing tools,
- (2) disadvantages of using AI-based English writing tools, and
- (3) different usage based on their English proficiency and levels.

First, the advantage of AI-based English writing tools was that easy accessibility and quick results were helpful for English writing, so it was evaluated as an efficient tool. However, if a learner wrote Korean and directly converted it into English, NP, made by a Korean company, is considered the best tool among the three options. Korean ELLs believed NP is an optimized platform for changing Korean into another language, such as English. Below is an excerpt from the full text of the students' interviews.

NP is quick and good for English translation because a Korean company made it. I believe that Papago has data written in Korean, so as a native Korean speaker, I think that Papago is the best for English writing or translation purposes (student 1 interview transcript).

I used GT when I needed to submit writing assignments in English. It is very convenient, and the result shows up on the screen quickly. I need to read again to double-check (student 5 interview transcript).

In addition, in the case of Grammarly, most university students used the basic version, often used to check grammatical functions or different word changes. In particular, English learners reported that Grammarly is helpful and useful when submitting English writing assignments. Most of the students taking liberal arts English classes submitted English writing assignments for class; in this case, they found Grammarly to be the most useful. Most ELLs knew that the Grammarly Premium version had advanced functions, but they hesitated to use it because of the high cost of paying about \$120 a year in US dollars. Below is an excerpt from the full text of the students' interviews.

I used Grammarly before submitting an English writing assignment. I knew my English writing had some errors, so I had to use it. I was informed that Premium has more functions like advanced tools, but I need more money to afford it. I am okay with the basic version now (student 3 interview transcript).

The most prominent theme from the pros of using AI-based tools is to reduce ELLs' anxiety about English writing. When they think their English proficiency is low, English writing is a huge burden and stress for them. However, they can get help whenever needed, thanks to recent technology and AI. Thus, relieving their English learning anxiety is the most important aspect of using these AI-based writing tools.

I always felt pressure to write in English because my English skills were insufficient to write long English essays. However, with the help of AI-based tools, my anxiety about English writing can decrease because I can get help from these tools. How can ELLs survive without AI technology, like in the '90s? (student 4 interview transcript).

Some advantages were derived from the interview analysis, but the disadvantages of AI-based English writing tools were also derived from interview results. Specifically, relying on these tools might not help develop one's English language skills, especially writing. In particular, English learners with beginner levels of English proficiency were found to rely too much on AI-based translation tools rather than writing English independently. ELLs were also aware of this, but it was found that they could not easily give up using these tools because of their convenience and efficiency. Below is an excerpt from full text of the students' interviews.

I like these tools. However, my English composition skills will stay the same if I rely less on. Also, faculty warns to use them only sometimes without making their English sentences. However, I need those to submit English writing assignments. Otherwise, I would spend too much time on this English writing assignment (student 2 interview transcript).

In addition, although the accuracy of translation has increased due to the recent development of AI technology, it has been revealed that there are still limitations. For example, awkward sentences or expressions may appear in English writing that converts writing in Korean into English. ELLs expect these problems to decrease as AI technology advances, but they have noted the accuracy limitations so far. Below is an excerpt from the full text of the students' interviews.

These tools need to be improved because I see some weird sentences that do not match the context I originally thought about. Especially for idioms in Korean, it is hard to change into English. I must search for those again to use the proper ones (student 1 interview transcript).

Third, an interesting finding among the interview results was that university ELLs approached and used three tools differently depending on their English skills and proficiency. Specifically, in the case of reading English, ELLs who think their English level is advanced were found to read the original text in English without translating it using NP. In addition, it was found that high-level English learners make English sentences first and then judge the feedback of the final result provided by Grammarly. In addition, it was found that they critically accepted the feedback provided by Grammarly and decided whether to apply it independently. Below is an excerpt from the full text of the students' interviews.

I like Grammarly because it gives us some options to change. So, after writing English, I use it for final confirmation. However, sometimes, feedback does not fit my original intention of writing, so I accept the necessary parts of feedback. I can judge those based on my knowledge (student 5 interview transcript).

However, in the case of beginner English learners, it was found that Grammarly feedback was accepted without a critical thinking process. Beginner ELLs were found to have a higher degree of trust and dependence on AI translation tools, primarily because their English skills needed improvement, and they were less able to judge their work and accept feedback. Below is an excerpt from the full text of the students' interviews.

Regarding Grammarly's feedback, I accept all the changes it made for me. I could not tell the difference, and I do not have confidence in English writing better than AI, which is advanced. So, Grammarly's feedback is right, and I must go with it. There is not much choice I could think of differently (student 4 interview transcript).

DISCUSSION

This research explored the perceptions of Korean university students regarding AI-based tools, including GT, NP, and Grammarly. An online survey was conducted with a total of 80 Korean university students. After the survey, a focus group interview was conducted with five participants. The study results are, as follows. First, the survey results indicate that ELLs found AI-based tools effective for English writing courses. The results also showed that ELLs preferred GT or NP, especially in the context of English writing tasks. According to students who used GT/NP, they preferred its user-friendliness, highlighting the ease of use as a significant benefit. Many university ELLs found it particularly advantageous for enhancing vocabulary, providing translations, using rich expressions, learning grammar, and English writing proficiency. In addition, many ELLs reported that Grammarly's feedback provided them with expressions or structures. They reported the convenience of the tool's automatic feedback feature. Additionally, Grammarly was acknowledged for its proficiency in error detection and correction, highlighting its capacity to scrutinize and fix mistakes and its corrective capabilities.

These results are consistent with previous studies that reported positive impacts on ELLs' L2 writing skills when allowed to use AI-based tools. For instance, Briggs (2018) found that about 50.00% of Korean ELLs

thought online MT was valuable as a language learning tool. Jeong's (2021) study also showed that language learners' English writing skills improved when using automatic translators, such as NP and GT, and they felt comfortable using them. Lee's (2019) study examined the role of GT in improving L2 writing and establishing writing strategies for university ELLs. The results showed that using GT reduced grammar errors and positively affected English writing strategies. Furthermore, most university ELLs used automatic translators for English learning, which helped with vocabulary, grammar, and expression in their English composition correction. Lastly, Reis and Huijser's (2016) study also showed that Grammarly provided more in-depth feedback and useful functions for English writing.

However, interview analysis showed that there were also some disadvantages of using AI-based tools. For instance, while many university students found the advantages of NP/GT helpful in improving their overall English skills, some ELLs expressed concerns about inaccurate translations and unnatural expressions or grammatical structures. Also, other ELLs worry about becoming overly dependent on AI-based tools and need help cultivating their English writing skills. Interview analysis also showed these AI-based writing tools' different usages and purposes. Students used NP and GT (MT) from their native language to English. For example, they mainly used these tools to translate their native Korean into English. However, students used Grammarly(generative AI) to help with their written English writing and style. It is also important to recognize how students use these tools for different purposes in English writing.

These findings suggest that using AI-based learning tools in university English writing classes requires careful consideration. Rather than relying solely on these AI-based tools, university English classes should be designed to incorporate them effectively. Specifically, proper guidance for integrating AI-based English tools can positively impact the learning process, enhancing university students' English writing without hampering their language development (Gayed et al., 2022; Klekovkina & Denié-Higney, 2022).

CONCLUSIONS

This study examines the perceptions of Korean university students towards AI-based writing tools, such as GT, NP, and Grammarly. The research team surveyed 80 Korean university students who had taken English writing courses and invited volunteers to participate in focus group interviews. The findings suggest that these tools can be beneficial for ELLs to improve their writing skills, with ELLs highlighting specific strengths and weaknesses of each tool. However, the study also revealed that an overreliance on AI-based writing tools could hinder the English writing process for ELLs. The results emphasize the need for effective integration of AI-based tools in adult ELLs' English language instruction across the globe.

It is important to provide detailed guidance on when and how to use AI-based tools in English writing classes to increase the effectiveness of AI-based writing tools. ELLs can also use Grammarly to check and correct peripheral errors in grammar or vocabulary use, thereby reducing the burden on teachers. Also, MT can be achieved through practicing paraphrasing the translated results in class. Also, ELT educators in higher education should consider both the positive and negative aspects of using AI-based writing tools when designing effective English courses. These educators should work on developing strategies for effectively integrating these AI-based writing tools into university classrooms while being aware of the limitations and potential of AI-based tools. By reflecting on ELLs' feedback through these tools, ELT educators can help ELLs develop their English language skills thanks to AI era.

It is also crucial to teach university students how to use these AI-based tools based on their level of English writing skills. For beginners, these tools could be avoided as they could hinder the development of basic writing skills, such as sentences and paragraphs. However, advanced English learners could benefit from comparing drafts looking for better vocabulary, expressions, grammar, and sentence structures through AI-based tools to develop their English writing skills.

In this regard, further research is necessary to explore the potential of AI-based English writing tools to improve the quality of L2 writing guidance in an EFL environment. As we enter AI era, ELT instructors in higher education must incorporate the latest technologies available in L2 writing classes to improve foreign language education. Evaluating university students' compositions and offering constructive feedback with these tools will be key issues in ELT classrooms based on ELLs' proficiency levels.

Limitations

While this study provides valuable insights into the use of AI in ELT, it is important to acknowledge its limitations. One potential limitation is the size and diversity of the sample population, which may impact the generalizability of the findings. Additionally, the subjective nature of the data collected through students' perceptions warrants consideration. Factors such as prior experience with technology, English proficiency, and attitudes toward AI tools may influence these perceptions. It would benefit future studies to take a multi-perspective approach, considering ELLs' previous experiences with AI-based learning tools.

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