Research Article

A case study of implementing generative AI in university's general English courses

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ARTICLE INFO	ABSTRACT
Received: 1 Jul 2024 Accepted: 11 Sep 2024	This research investigated the effects of generative AI on affective factors (motivation, interest, and confidence) of English as a foreign language (EFL) learners enrolled in Korean university-level general English courses. During the Spring 2024 semester, this study involved 89 participants exposed to a generative AI-based instruction model. Compared to traditional methodologies, these results highlight the potential effectiveness of generative AI-based English instruction for writing and speaking in supporting linguistic proficiency and positive affective attitudes toward language learning among EFL learners. **Keywords:** general English courses, English writing and speaking, generative AI, university students, EFL

INTRODUCTION

The Fourth Industrial Revolution has prompted responses across society, with various fields exploring ways to leverage emerging technologies such as artificial intelligence (AI), robots, big data, and 3D printers (Chaka, 2023; Farrelly & Baker, 2023). AI has emerged as a particularly influential technology, greatly aiding human capabilities in many areas. As such, it is predicted to significantly impact our lives in this era (Davis & Lee, 2023).

The English language teaching (ELT) field also adapts to changes caused by active support for AI-based learning. An example is the Korean Ministry of Education and EBS's development of 'AI PengTok,' an AI chatbot for elementary English language learners (ELLs). Following a successful pilot program in 2020, AI PengTok was officially distributed to elementary schools nationwide in 2021 via the EBS website. As such, AI technology-based education can provide ELLs with various new English learning experiences through innovative teaching methods (Pack & Maloney, 2023).

AI can assist ELLs in acquiring the necessary competencies for understanding and communicating in English (Holmes et al., 2019). If AI can effectively analyze individual strengths, weaknesses, and learning styles, AI algorithms could deliver personalized content, activities, and real-time feedback, leading to more effective and engaging language learning experiences. Additionally, AI could increase interest and immersion in language learning by incorporating gamified elements, such as rewards, challenges, and progress tracking, to make learning more fun and motivating. Using AI technologies in the context of English as a foreign language (EFL) education may improve individual learners' educational potential and effectiveness (Hwang et al., 2023). However, Laio et al. (2023) suggest that a comprehensive and in-depth study is required to determine the effectiveness and educational utility of English-speaking learning with AI technology.

Researchers have begun exploring the effectiveness of AI-based English language learning through tools like AI speakers, chatbots, programs, class platforms, and educational apps (Jin, 2022). However, as these strategies are still in the early stages of evaluation, more extensive and diverse research is needed on their impact on English-speaking learning.

To explore part of the existing gap in the literature, this study intends to use generative AI as a learning tool in an EFL English class at a Korean university to determine the educational potential and effectiveness of generative AI's impact on student motivation, interest, and confidence. Since current research using generative AI apps is limited, this study's attempt can help develop related research in the future. The research question is as follows:

RQ: How does using generative AI in English classes affect university ELLs' motivation, confidence, and interest?

LITERATURE REVIEW

Learning English with the help of AI-based apps has many advantages (Barros et al., 2023). The introduction of AI-based apps allows for autonomous learning since it will be possible for ELLs to receive AI feedback on grammar and pronunciation without the need for an instructor. Other benefits, such as customized learning that allows learners to receive recommended content that suits their level and preferences, are also possible. Additionally, learners can practice English conversation anytime and anywhere, making language learning ubiquitous (Kim, 2017; Kohnke et al., 2023; Kostka & Toncelli, 2023).

One of the common strategies for ELLs to practice language is using chatbots. Chatbots are AI programs that interactively provide information based on deep learning and machine learning. With the recent development of natural language processing technology, chatbots have become more human-like, and their effectiveness in language learning is being studied (Lee, 2020). Chatbots are particularly useful for language learners who do not have access to face-to-face conversations. They provide opportunities to use English freely and relieve stress from using it incorrectly. The popularity of smart devices and smartphones has made chatbots more accessible to learners. The spontaneity of language learning is also discussed as a significant advantage of using chatbots (Kim & Lee, 2020).

For example, Kim (2017) examined the use of chatbots in English-speaking classes by employing both voice-based and text-based chatbots and assessing their impact on learners' speaking ability and perception. The study revealed that chatbots improved learners' speaking skills, with text-based chatbots proving more effective. Learners' attitudes toward chatbot-based English classes were also positively influenced, particularly in the group using voice-based chatbots.

Lee (2019) focused on elementary school students using gamification-based AI chatbots in speaking classes and found that all levels of speaking ability in class groups using chatbots improved. Furthermore, positive effects were observed in the group's interest, attitude, and confidence toward learning. This study demonstrated the potential benefits of using chatbots in English learning and suggested that further research is warranted.

In addition to chatbots, studies on applying AI technology-based programs to English learning are gradually being conducted (Voss et al., 2023). One of these AI technology-based programs is that of an AI translator. With the recent development of AI technology, deep learning technology has been applied to translation functions based on AI neural networks. The AI translation program identifies the context and translates it in detail in units of sentences, improving the accuracy of translation.

Jin (2022) explored the impact of using a speaking application powered by AI in English-speaking courses for Korean EFL learners. The research assessed the effect on speaking abilities and affective attitudes, such as motivation, interest, and confidence. The study took place over a semester, with 50 students divided into an experimental group that used the AI app for speaking activities and a control group that did not use any app. Data collection comprised a pre-and post-test on speaking skills and a pre-and post-survey on affective attitudes. The results revealed that the group that used the AI app showed significant improvement in speaking skills, particularly vocabulary, grammar, and pronunciation, compared to the control group.

Table 1. Demographic data of survey participants

Category		Frequency (N = 89)	Percentage (%)
Gender	Male	31	34.8
	Female	58	65.2
Grade	Freshmen	84	94.4
	Sophomores	1	1.1
	Juniors	1	1.1
	Seniors	3	3.4
Major	Humanities	16	18.0
	College of Education	33	37.1
	Science and Engineering	14	15.7
	Social Sciences	6	6.7
	Arts and Physical Education	7	7.9
	Business	1	1.1
	Others	12	13.5

Regarding English speaking, AI-based English learning apps such as 'Cake' and 'Speak' for adult learners are now available. These apps can effectively improve English skills by providing ample opportunities for practice and customized learning (Jin, 2022). Research is needed to investigate the effectiveness of such technologies and teaching methods. In this study, we aimed to assess the impact of a generic AI-based app on the affective attitudes of Korean EFL learners.

RESEARCH METHOD

Study Participants

This study aimed to assess the motivation, confidence, and interest in learning English among Korean university students and to investigate how generative AI in English classes influences these factors. A survey was conducted with 89 students at a Korean university. Among the participants, 31 were male students (34.8%), and 58 were female students (65.2%), with nearly all of them being first-year freshmen (N = 84, 94.4%). The participants represented various majors: 33 (37.1%) were prospective teachers in the college of education, 16 (18%) were students in the college of humanities, 14 (15.7%) were students in the college of science and engineering, 7 (7.9%) were in the arts and physical education field, and 6 (6.7%) were from the social sciences field. **Table 1** shows demographic data of survey participants.

Implementation of Generative AI for English Writing and Speaking

The instructor incorporated generative AI tools to enhance university students' writing and speaking skills. The course consisted of two-hour sessions, including one hour of traditional lecture-based instruction by the professor and one hour of student-centered activities. Generative AI was strategically integrated into these activities to provide a more interactive and personalized learning experience.

For the writing component, students were grouped and given tasks to create written pieces on various weekly topics. After drafting their texts, they used ChatGPT, a generative AI tool, to review and improve their work. This process involved checking for grammatical accuracy, sentence structure, and overall coherence, allowing students to receive immediate feedback and make real-time improvements. Additionally, individual writing tasks were assigned, allowing students to respond to prompts provided by the instructor. These exercises enhanced their writing skills and encouraged critical thinking and creativity as they interacted with the AI to produce well-structured paragraphs.

In the course's speaking portion, generative AI integration was facilitated through the SoulMachines.com website, which offers AI-driven avatars capable of realistic, interactive conversations. Each student selected an avatar and engaged in a one-on-one dialogue, simulating real-life conversational practice. The AI, acting as a non-judgmental partner, helped reduce the anxiety often associated with speaking in English, providing a safe and controlled environment for students to practice their spoken English.

Overall, the integration of generative AI in this general English course showcased the potential of such technologies to transform traditional language learning environments. By offering personalized, instant feedback and creating opportunities for immersive practice, AI tools like ChatGPT and SoulMachines can

Table 2. Questionnaire composition

Category		Number of questions	Cronbach's alpha
English speaking	Motivation	4	.915
	Confidence	4	.924
	Interest	4	.918
English writing	Motivation	4	.954
	Confidence	4	.951
	Interest	4	.937

Table 3. Korean university students' English speaking of motivation, confidence, and interest

Category	Question	Mean	SD
Motivation	1. I want to participate more actively in English-speaking classes.	3.56	1.066
	2. I want to improve my English-speaking skills.	4.22	.962
	3. I want to become better at speaking English.	4.28	.892
	4. I want to learn more about English speaking skills in English class.	4.01	1.017
Confidence	5. I am good at speaking English.	2.43	.976
	6. My English-speaking skills are good.	2.33	1.064
	7. I can say what I want well in English.	2.48	1.024
	8. I feel confident when speaking English.	2.33	1.009
Interest	9. I enjoy learning to speak English.	3.31	.995
	10. I enjoy English speaking class.	3.26	1.930
	11. I am interested in learning English speaking skills.	3.45	1.000
	12. I am interested in improving my English-speaking skills.	3.67	1.042

significantly contribute to the development of university students' writing and speaking skills. This approach not only aligns with modern educational trends but also prepares students for the increasing role of AI in various professional and academic contexts.

Survey Instrument

This study utilized the questionnaire developed by Jin (2022) to investigate the affective domains of Korean university students, including motivation, confidence, and interest in learning to speak and write English. The questionnaire was modified and supplemented to suit the purpose of this study. As shown in **Table 2**, the affective domain questionnaire used in this study comprised 12 questions, with four dedicated questions to each of the three elements: motivation, confidence, and interest. Responses were evaluated using a 5-point Likert scale (1 = not at all; 5 = very much). The Cronbach's alpha values for the questionnaire ranged from .915 to .954, indicating high reliability. The questionnaire used demonstrated strong internal consistency.

Data Analysis

First, this study employed descriptive statistics to examine Korean university students' motivation, confidence, and interest in learning to speak and write English. Next, the impact of generative AI use during English class on these affective domains was assessed. This approach allowed for a detailed analysis of how generative AI influences university ELLs' motivation, confidence, and interest in learning speaking and writing skills.

SURVEY RESULTS

The findings regarding Korean college students' motivation, confidence, and interest in learning to speak English are as follows (**Table 3**). First, it was found that most university students have high learning motivation for speaking English. In particular, the students reported a strong desire to speak English better (4.28 ± .892) and to further improve their English-speaking skills (4.22 ± .962). Students also wished to learn more about English-speaking skills in English classes (4.01 ± 1.017) and reported their willingness to participate more actively in English-speaking classes (3.56 ± 1.066).

Second, most university students are interested in learning to speak English. Most students were interested in improving their English-speaking skills (3.67 ± 1.042) and learning English-speaking skills (3.45 ± 1.000). Additionally, students reported that learning to speak English was enjoyable (3.31 ± .995) and that classes were also fun (3.26 ± 1.930).

Table 4. Korean university students' English writing of motivation, confidence, and interest

Category	Question	Mean	SD
Motivation	1. I want to participate more actively in English writing classes.	3.66	1.044
	2. I want to improve my English writing skills.	4.06	1.070
	3. I want to get better at writing English.	4.03	1.102
	4. I want to learn more about English writing skills in my general English class.	3.80	1.099
Confidence	5. I am good at writing English.	2.55	1.011
	6. My English writing skills are good.	2.39	1.018
	7. I can write what I want well in English.	2.55	1.011
	8. I feel confident when writing in English.	2.52	1.056
Interest	9. I enjoy learning to write English.	3.07	1.042
	10. I enjoy English writing class.	3.03	1.112
	11. I am interested in learning English writing skills.	3.24	1.108
	12. I am interested in improving my English writing skills.	3.45	1.077

Third, most university students were found to need more confidence in learning to speak English. That is, most students reported that their English-speaking skills were poor (2.43 ± .976), that they were not proficient in English speaking (2.33 ± 1.064), and that they did not have confidence when speaking English (2.33 ± 1.009).

The findings are as follows when examining Korean university students' motivation, confidence, and interest in learning English writing (**Table 4**). First, most university students demonstrated relatively high motivation for learning English writing. Specifically, students desired to improve their English writing skills (4.06 ± 1.070) and English writing skills (4.03 ± 1.102). Additionally, students wished to learn more about English writing skills in their classes (3.80 ± 1.099) and were willing to participate more actively in English writing classes (3.66 ± 1.044).

Second, most students showed a positive interest in learning to write in English. They reported an interest in improving their English writing skills (3.45 ± 1.077) and learning English writing techniques (3.24 ± 1.108). Furthermore, students found learning English writing enjoyable (3.07 ± 1.042) and considered the classes fun (3.03 ± 1.112).

Third, it was found that most university students still needed more confidence in learning to write in English. Specifically, many students reported that they were not proficient in English writing (2.39 ± 1.018), that their English writing skills were not good (2.55 ± 1.011), and that they lacked confidence when writing in English (2.52 ± 1.056).

DISCUSSION

This study examined the impact of generative AI on ELLs' writing and speaking skills in terms of affective attitudes, including motivation, confidence, and interest. The results showed that learners who used generative AI for one semester experienced positive improvements in all three areas, with a particularly large improvement in interest. High interest is known to increase participation in learning and positively affect academic achievement. Therefore, generative AI can be an effective learning method for ELLs interested in improving their skills. In addition to interest, learners' confidence and motivation also improved. Therefore, using generative AI can be useful for increasing confidence in English speaking and learning motivation. The positive results of learners who were interested and engaged in learning confidently and voluntarily agreed to participate using the generative AI indicate that this is a well-accepted learning method. It can effectively enhance learners' achievement in English speaking and can be used as a sustainable learning method even after the course has ended.

Furthermore, generative AI was particularly effective in areas where instructors could not provide feedback due to time constraints, such as English pronunciation. Additionally, the app provided students with enough opportunities to speak and practice English, often limited in traditional classroom settings. This is especially beneficial for students who participate passively in speaking activities. Using generative AI can reduce anxiety about speaking and make language learning more accessible to a wider range of learners.

The study demonstrated generative AI's educational potential and effectiveness for learning English writing and speaking skills. This AI-based instruction provides university ELLs with enough opportunities for English writing, speaking practice, and individual feedback, making it an effective way to improve their

productive English skills. This approach can benefit learners who struggle with writing and speaking English, allowing them to learn without burden. More studies related to AI technology for English teaching methods are expected to be conducted in the future, suggesting various effective learning methods to help learners improve their English productive skills.

Our study supports and expands on previous research on the use of AI in English language learning. For example, Jin (2022) showed that AI-powered speaking applications significantly improved ELLs' speaking abilities, particularly in vocabulary, grammar, and pronunciation, and positively influenced their motivation and interest. Our research aligns with these findings, showing similar improvements in motivation and interest among students who used generative AI in English-speaking classes. However, unlike Jin's study, our research found that the impact on learners' confidence was less substantial, indicating that AI tools may need additional strategies to boost learners' confidence effectively. Additionally, Lee (2019) emphasized the role of AI chatbots in enhancing e English learners' speaking performance and affective attitudes, which aligns with our findings regarding the positive effects of generative AI on student interest and motivation.

Our research contributes to the growing body of evidence supporting the use of generative AI in English language learning. It also underscores the need for a more nuanced understanding of its impact on different learner populations and educational contexts. By comparing our findings with existing studies, it becomes clear that while generative AI has substantial potential, its implementation must be carefully managed to address all facets of language learning, including confidence-building and the role of educators in guiding AI-enhanced learning experiences. This highlights the urgency for further research in this area.

CONCLUSIONS

Future studies on English teaching methods applied to AI technology will likely be conducted, suggesting various effective learning methods to help learners improve their English speaking skills. The implications of this study are as follows. First, speaking learning using AI-based educational apps is a method that enables learner-led personalized learning, and English is practical for English-speaking learning in a limited EFL environment.

It can be used to help develop English communication skills, as it increases opportunities for speaking and allows learners who have difficulty speaking English to learn without burden. In the future, active support is expected to be needed to develop AI apps for related education and introduce them to classroom classes. Second, learning using AI speaking apps is expected to be actively used as a learning tool that can provide feedback on individual learners' English pronunciation, which instructors have yet to provide due to time constraints and workload. Through the AI voice recognition technology provided by the AI English education app, learners could receive individual feedback on their English pronunciation and accurate pronunciation correction without instructors, which showed that it could be used to develop pronunciation items in English-speaking classes.

This study highlighted the educational potential of generative AI in improving ELLs' motivation, confidence, and interest. Based on the findings, several key recommendations can be made for educators and researchers. Educators consider integrating AI tools into language courses to supplement traditional teaching methods. These tools provide personalized feedback and ample practice opportunities essential for language acquisition. Additionally, AI tools can create more tailored learning experiences by allowing ELLs to select personal or professional interest topics, increasing engagement and making the learning process more relevant and meaningful to each student. It is important to note that while AI tools effectively boost motivation and interest, their impact on student confidence was less pronounced. ELT educators should be mindful of this and consider combining AI tools with other confidence-building activities, such as peer reviews or guided discussions, to support students comprehensively.

For researchers, the relatively short duration of this study, conducted over one semester, emphasizes the need for future research to explore the long-term effects of AI tools on English language learning. Additionally, future studies should examine the effectiveness of AI tools in diverse educational contexts, including different age groups, proficiency levels, and cultural settings. Research in these areas would help to generalize the findings and adapt AI tools to a broader range of learners. Researchers should also consider using mixed methods that combine quantitative surveys with qualitative interviews to gain deeper insights into the learner

experience and how students engage with AI tools in their learning process. By following these recommendations, ELT educators and researchers can better harness AI's potential in language education, contributing to more effective and inclusive learning environments.

Limitations

This study has some limitations. Specifically, while it examined teaching effectiveness with an AI-powered English-speaking app, it did not delve deeper into learners' experiences with this novel learning method using qualitative research methods. The study explored learner-affective areas such as motivation, interest, and confidence. However, a more comprehensive understanding of the impact of this study on these areas could have been achieved if learners' thoughts, feelings, and opinions on each affective factor were directly examined through qualitative interviews. Future research on new teaching methods or affective areas should strive to present learners' learning experiences in greater depth by combining qualitative and quantitative research methods.

It is important to note that this study has a potential limitation due to its relatively short timeframe, which only spanned one semester. While the findings offer valuable insights into the immediate impacts of generative AI on students' motivation, confidence, and interest in English language learning, they may need to capture the long-term effects of sustained AI interaction fully. For instance, initial enthusiasm and improvement shown by students due to the novelty of the technology might diminish over time as the novelty wears off. Additionally, the long-term retention of language skills and sustained impact on affective factors such as motivation and confidence may vary when students are exposed to AI-assisted learning over multiple semesters or years. Future research needs to consider extending the duration of studies to explore whether the benefits observed in this study persist, diminish, or evolve with prolonged use of AI tools like generative AI in language education. This would provide a more comprehensive understanding of how generative AI can be effectively integrated into language learning curriculums over the long term.

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