AI Chatbots: Developing English Language Proficiency in EFL Classroom

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Abstract
The current paper attempts to explore the potential implications and feasibility of AI Chatbots in EFL contexts, as well as how they can help in second language acquisition. To assess data and achieve its intended goals, the current study employs various techniques, including commentaries, online interviews, questionnaires, quantitative and qualitative methodologies. The research’s relevance is limited by the fact that Chinese middle school students often struggle with their spoken English. This study aims to present the outcomes of teaching oral English to Chinese middle school students by using AI Chatbots. The content's applicability in developing speaking skills is a powerful argument for the research's practical value. The findings indicate that AI Chatbots foster students speaking skills creating a stress-free and non-competitive learning environment.

Keywords: AI Chatbots, EFL classroom, English language proficiency, intelligent tutoring systems, speaking skills, virtual reality

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Introduction

The emergence of Artificial Intelligence (AI) has fundamentally reshaped different aspects of human life, including language learning. In our days being able to speak multiple languages is not only valuable but also crucial in specific contexts. It is out of doubt that AI has become an indispensable component of language acquisition. However, it does not signify that AI techniques will substitute conventional language teaching and learning. A great importance should be attached to applying AI technology in conventional teaching practices. For a long time, language enhancement was centered on conventional methods like educational materials, classroom instruction, grammar drills, etc. However, this methodology frequently failed to effectively engage mainly because they were seen as overly broad and too generic. In recent years AI technology has been embedded in learning process making language acquisition more pleasant, and satisfying.

AI technology has refined conventional approaches to language learning, providing a dynamic and captivating learning environment for students of different ages. By offering personalized experiences, artificial intelligence is revolutionizing language education. AI tools measure learners' distinctive learning styles, adjust the content based on the needs and requirements of learners and customize exercises according to the abilities and weaknesses of the students. Numerous studies have proved that AI positively impacts the overall outcome of the classroom setting.

Undoubtedly, the emergence of AI has dramatically altered the fundamental layout of language enhancement, while also posing new challenges for redesigning the traditional setting of education. Studies have also stated that the implementation of AI tools in a language learning environment has a lot of drawbacks. Since the advent of AI, language teachers have tried to incorporate AI teaching tools into the educational environment. Teachers need to focus on figuring out new ways how to employ AI tools in the classroom setting and take an in-depth look at the potential benefits that technological advances may bring to the students. Hence, more studies should be conducted to develop and prompt the efficiency of utilizing AI tools in language acquisition.

The practical significance of the research is deeply supported by the applicability of its content in teaching foreign languages. The findings thereof can serve as a theoretical basis for other research projects relevant to teaching speaking.

The Study Objectives

The current research paper aims to:

1. Determine the feasibility of employing AI Chatbots in teaching speaking to middle and high school students in China,
2. To identify the perceptions of middle and high students on employing AI in teaching speaking,
3. To ascertain the advantages and possible opportunities of applying AI Chatbots in EFL classrooms.

Taking into consideration all the above-mentioned, there is a need to confirm and evaluate the possible effects of AI tools on ESL learning. Hence, the following study makes an attempt to fill the gap by posing the following research questions:

Q1. How do students' communication skills differ after interacting with AI chatting tools?
Q2. What is the overall feedback of students using artificial intelligence to increase their English speaking proficiency?
Literature Review

Artificial Intelligence and Teaching Foreign Languages

In today's interconnected world, English language proficiency has become an essential skill for individuals seeking to thrive in various personal, academic, and professional contexts (Sari, 2023). Possessing good language skills is considered to be a must for everyone. It provides a broader range of opportunities in different aspects of human activity. This is one of the key reasons that many individuals try to enhance their speaking skills.

The emergence of AI has significantly changed the layout of the whole educational system, particularly foreign language learning, because AI-powered tools and technologies are being used to provide more immersive and engaging learning experiences for students of all grade levels, personalize learning, and offer quick feedback (Sotomayor Cantos et al., 2023).

According to Azwary, AI-based computer programs can carry on conversations via audio and text, providing intelligent responses with natural language functions and allowing them to interact actively with users (Azwary et al., 2016). Compared to the conventional methods of teaching Spoken English, AI Chatbots possess some peculiarities. As Fryer and Carpenter (2006) mentioned, “One of the strong points of a Chatbot is its convenience” (Fryer & Carpenter, 2006, p.10). According to Huang, AI plays a vital role in implementing one-to-one personalized teaching and learning (Huang et al., 2021).

The integration of speech recognition technology in existing systems has led to the development of applications offering unprecedented benefits for language learning, mainly related to speaking (Kannan & Munday, 2018). Kim et al. (2019) reviewed different types of AI chatbots and reported on their effectiveness in terms of EFL learning. Recent studies like those of Chen et al. (2023), Moussalli and Cardoso (2020), and Wang et al. (2022) have reported that language learners show positive attitudes toward AI tools for language learning (Son et al., 2023). The word AI is a broad term, which sometimes leads to misconceptions. In this paper, by mentioning AI tools, we refer to chatbots and voice bots, VR and ITS-based communication tools.

AI Chatbots

One example of AI technology is Chatbots or voicebots. AI chatting robots are software applications that employ Natural Language Processing (NLP) to replicate human-like conversation. A Chatbot is a dialogue software program that can interact with users and process their inputs using natural language (Huang et al., 2021). Chatbot is an AI-based computer program that engages in oral and written conversations and interacts with learners in any theme by providing intelligent conversations using human-like lingo (Haristiani, 2019).

AI Chatbots foster authentic conversations for language learners, enabling students to interact in their preferred language. Particularly, in foreign language learning, AI Chatbots play a beneficial role, providing students with a means of language practice (Haristiani & Danuwijaya, 2019). These bots can hold real-time dialogues, reply to questions promptly, provide accurate feedback, and so on. They provide students the opportunity to listening and speaking skills in a spontaneous and natural environment. Moreover, Chatbots can easily identify errors and provide constructive feedback which can help language learners figure out their mistakes and improve them. Chatbots increase the social presentation of shy students (Ayedon et al., 2019).
The latter minimizes the negative patterns of error making on students’ development over the time. It provides a non-competitive, and stress-free environment where students can practice spoken English at their convenience. AI voicebots and Chatbots additionally provide language learners with the chance to practice English in a variety of contexts and on a wide range of topics.

**Virtual Reality**

The field of education has been revolutionized by the application of virtual reality (VR). VR technologies have positively influenced all aspects of education from STEM to language learning. Immersion is an important factor in the process of language acquisition. Richardson et al (2017) pointed out that VR was the feeling of presence in a virtual environment, namely, the artificial environment (Xie et al., 2022).

Nowadays, students can employ VR to travel virtually and interact with the carriers of the target language. As opposed to text or video, VR technologies enable students to practice speaking a foreign language meanwhile maintaining a sense of confidence and safety. VR-based teaching tools have demonstrated to yield several positive outcomes when applied with English as a foreign language enhancement. Today VR technology is in its empirical-study phase, but it has incredible potential to improve our lives (Alfadil, 2020). To utilize interactive virtual environments and avatars in the classroom setting, appropriate training is required for ESL learners.

**Intelligent Tutoring Systems**

Another significant advancement of AI in education is the emergence of Intelligent Tutoring Systems (ITS). These systems use advanced AI algorithms to provide personalized learning, which alters according to the learner’s pace and demands. When compared to conventional teaching methods, ITS provides a more dynamic and interactive learning environment. ITS employs gamification strategies to capture learners’ intrinsic motivation and interest. They provide immediate feedback and tailor their material according to learners’ performance. Deployment of IT systems in education can lead to significant improvements. These systems help the students acquire new vocabulary, and master grammar patterns more quickly by providing personalized learning interaction.

**Methods**

**Research Design**

The current research paper studies how second language learners could employ AI tools to improve their English speaking performance through AI Chatbot interactions. This study involved 90 middle school students during the fall semester of 2023-2024. The study was carried out in the People's Republic of China, in Limai International School located in Nanchang, Jiangxi province in the 2023-2024 academic year Fall semester. Our research is conducted on the Boya curriculum. Boya's curriculum has integrated British and Chinese educational elements. It provides eight foreign language classes per week. Classes tend to develop the four aspects of language: reading, writing, speaking and listening. Reading and writing are taught by Chinese English teachers while speaking and listening are taught by foreign teachers. Chinese students and teachers pay much
attention to the writing aspect of the language because it is very decisive for their university entrance exam. The current study employed various strategies and methods, including online questionnaires, interviews, commentary, and quantitative and qualitative procedures, to assess data and meet its objectives. All the teacher participants were notified and adequately informed of the aims of the subsequent research, and, of course, their consent was sought, and received before the data collection process.

To enhance a better understanding of students' learning purposes, an online questionnaire by using random sampling. The questionnaire contains four questions handed to students (See Table One). The questions were as follow: Students answers were mainly confined to the desire to get better job opportunities, develop practical communication skills, self-development skills, etc.

**Demographic Information**

The summary of the demographic information about the students contains detailed information on participant students' purpose of foreign language learning, the weakest point of English, and experience with AI.

![Figure 1. Purpose of Learning English (Low, intermediate and advanced)](image)

![Figure 2. Weakest aspects of English](image)
Table 1. *Low and Intermediate-Level Students’ Experience with AI*

<table>
<thead>
<tr>
<th>Experience</th>
<th>No experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-level students</td>
<td>Yes (7 students)</td>
</tr>
<tr>
<td>Intermediate-level students</td>
<td>Yes (11 students)</td>
</tr>
</tbody>
</table>

Table one contains students' experience with AI-powered Chatbots before the research. In both groups, students identified speaking as their weakest points in English. Hence, the majority of students would like to improve their speaking and listening skills. In referring to the question of whether students had employed AI Chatbots previously, only eighteen students in both groups mentioned yes.

**Instruments**

**Course Materials**

*Students in both levels used Cambridge textbooks and PEP materials. Activities during class included group and pair discussions and individual work. The course materials and online resources included exercises in speaking, listening, grammar, and vocabulary. The AI-interaction exercises comprised brief questions and answer sessions, and survey responses regarding textbooks and video content. The topics varied from Sociology to environmental science, history, archaeology, food, etc.*

**AI Chatbots**

TalkPal AI(1), Bard AI(2), Dou Bao (3) were the AI Chatbots that were used in our survey. Before the current study began, all these AI Chatbots had been carefully observed. Students were instructed to choose their preferred Chatbot, download it or register and then practice their spoken English for 10-15 minutes daily. A lot of students preferred to use Dou Bao because it is Chinese.

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**Figure 3. AI Chatbots**
Teaching Procedures

At the start of the 2023-2024 academic year students took a speaking pre-test. The speaking pre-test was designed for middle school students from grade seven to grade nine. It contains two tasks. The first task asked students to answer five questions and the second task required reading a text. All the participant students recorded their voice files on their smartphones and transferred to teachers via Dingtalk and WeChat applications. The latter applications enjoy much popularity among the Chinese. Right after the speaking pre-test, we started our experiment. Class activities and tasks were designed based on the textbooks and PEP course. The lessons included listening and speaking tasks, vocabulary enrichment as well as grammar drills. Grammar and vocabulary lessons were conducted by Chinese English teachers, while listening and speaking lessons by foreign teachers. All students practiced their speaking via AI tools. Students carried AI based conversations on different topics: daily life, hobbies, customs and traditions, etc. When they ran out of questions to interact with AI Chatbot, teachers provided them many questions tackling diverse aspects of life.

Table 3. Examples of Questions

<table>
<thead>
<tr>
<th>Week 5</th>
<th>Week 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you buy shoes?</td>
<td>Where are you living right now?</td>
</tr>
<tr>
<td>Where do you usually buy shoes?</td>
<td>What is unique in your community?</td>
</tr>
<tr>
<td>What is your favorite type of shoes?</td>
<td>Describe the neighborhood you live.</td>
</tr>
<tr>
<td>Why do some people have too many shoes?</td>
<td>Who is your best friend and classmate?</td>
</tr>
<tr>
<td>Have you bought shoes online?</td>
<td>What can be improved in your community?</td>
</tr>
</tbody>
</table>

Throughout the Fall semester, students practiced their speaking with AI voice Chatbots in terms of the weekly topic. In week 14, the questionnaire was completed with a 100 percent response rate. Interestingly enough Chinese students like interacting with AI Chatbots more than in the classroom, as they are afraid of making mistakes in front of the audience.

Data Analysis

For this study, qualitative and quantitative data analyses have been employed. The speaking pre-and post-tests are designed to compare the students' improvement at the beginning and end of the experiment. Students' answers were evaluated according to 0-5 evaluation criteria. Students' answers were collected, and assessed by three researchers. If there was any disagreement, a discussion was held until a final consensus was reached. Cronbach's alpha was used to assess raters' reliability.
SPSS (Statistical Package for Social Sciences) was employed to analyze the data collected from the tests and questionnaires. To compare the outcomes between the pre- and post-tests a dependent sample t-test was carried out. To study the differential effects of intermediate and low-level groups, an analysis of covariance was used. P was set at 0.05 to test the null hypothesis that there is no difference between the students. Qualitative analysis data contained the following questions: 1) What advantages might AI Chatbots offer in a general English course? 2) What features of employing AI Chatbots in a mainstream English classroom are the weakest? 3) What recommendations do you have for future applications of AI Chatbots to enhance speech recognition?

Discussion

The current study aims to investigate the differences in learners' speaking performances between the intermediate and low groups, as well as their improvements. The analyses of test scores before and after engaging with AI Chatbots are the focus of the first inquiry. The two tests were compared using paired sample t-tests.

It should be mentioned that the low-level group performed significantly differently on both tasks. In other words, after speaking with the AI, the low-level pupils' pronunciation, intonation, and stress levels all improved.

Pronunciation task scores for intermediate-level pupils were 2.19 on the post-test (MD = -.25) and 1.94 on the pre-test. With a mean difference of -.58, they performed significantly better than the low-level students on the intonation and stress task, scoring 1.96 on the pre-test and 2.54 on the post-test. For both tasks, a statistical difference was discovered between the two tests. The intermediate-level pupils, in summary, also improved their following their speaking sessions with AI, in terms of stress, intonation, and pronunciation.

The average fluency scores for reading a text loudly were achieved by employing the words per second (WPS) metric. The findings show no apparent improvement in the low-level pupils' fluency between the pre- and post-test scores of 1.88 and 1.83.

In comparison to low-level group students’ results, there was a statistically significant difference in fluency between pre and post-assessments for the intermediate-level students. Regarding fluency, the mean score was 2.12 in the pre-test and 2.31 in the post-test.

Regarding the second task, which involved responding to questions, Tables two and three show that the three distinct questions were assessed separately. In reference to question one in the low-level group, the pre-test mean score was 1.08, whereas the post-test mean score was 1.40 (MD = -.32). Question two had a pre-test score of .96 and a post-test score of 1.34 (MD = .38). Regarding the final question, the pre-test mean score was .98, while the post-test mean score was 1.38 (MD = .40).

The mean score of the pre-test was 1.81 and the post-test was 2.19 (MD = -.38) for the intermediate-level students on the second task for question one. The mean score for the second question was 2.17 (MD = -.33) in the post-test and 1.83 in the pre-test. For the final question, the pre-test mean score was 1.81, while the post-test mean score was 2.21 (MD = -.40).
Speaking abilities significantly improved when it came to the first test, which required them to read aloud a text. More specifically, every participant improved stress, intonation, and pronunciation. Only the intermediate-level pupils, however, demonstrated a discernible gain in fluency. Stated differently, the low-level students' speaking fluency did not increase due to chatting with the AI Chatbots. There were notable variations in scores for the respond-to-questions task for both groups. The study's results clearly show that both groups significantly improved their speaking competencies when they completed the first task, which required them to read the text aloud. More specifically, every participant improved their pronunciation, tone, and intonation. However, only intermediate-level students demonstrated an apparent rise in fluency. In other words, after using AI Chatbots to practise speaking, the low-level students' speaking fluency did not improve. Significant differences were marked in terms of the second task: answer the questions. It turned out that students in both intermediate and low-level group students got better scores in answering questions. It is worth mentioning that low-level students demonstrated more inner motivation and self-interest in chatting with AI Chatbots.

Findings

The findings of our study accord with the previous research conducted by numerous scientists. According to Haristiani and Danuwijaya (2019), AI Chatbots play a beneficial role by providing students with opportunities to practice their language (Haristiani & Danuwijaya, 2019). Moreover, some scientists emphasize the importance of integrating AI Chatbots into conventional language learning. According to Hoang et al., AI chatbots can increase students' language competency by providing extra practice and immediate feedback when integrated into traditional classrooms (Hoang et al., 2023).

Neri (2017) in her experiment also found that pronunciation training with a computer-aided system with a simple automatic speech recognition component can improve the ability of students compared to conventional pronunciation teaching (Noviyanti, 2020).

The role of AI chatbots is not only limited to developing listening and speaking skills. AI chatbots can also improve writing skills. As Labazde et al., mentioned AI Chatbots contribute to skills development by suggesting syntactic and grammatical corrections to enhance writing skills, providing problem-solving guidance, and facilitating group discussions and debates with real-time feedback. Overall, students appreciate the capabilities of AI chatbots and find them helpful for their studies and skill development, recognizing that they complement human intelligence rather than replace it (Labadze et al., 2023).

Perceptions of AI Communication among Students

The subject of the second question is to examine how students perceive the potential feasibility of AI communication to improve their speaking skills. Students were required to answer three questions about the drawbacks, benefits and recommendations for employing AI tools to ameliorate English speaking. Table Four (See Appendix) demonstrates the responses of students.
Out of 42 responses from the low-level group, thirteen students mentioned the positive influence of AI Chatbots on developing their speaking abilities and pronunciation. In terms of intermediate level, out of 48 responses, ten students reported positively on the usage of AI Chatbots in language learning. Moreover, seven (16.7%) of the low-level group’s students stated the importance of practicing spoken English in a stress-free environment. The ability to speak English in a more comfortable and stress-free learning environment was mentioned by ten intermediate-level students as well, as one of the most significant benefits of incorporating AI into language learning.

According to five (11.1%) intermediate-level students, speaking to an AI avatar has improved student participation, and boosted their level of engagement in class. Some students from the intermediate-level and intermediate groups reported that AI Chatbots enabled them to acquire new knowledge and practical vocabulary. Other opinions include raising interest, and boosting confidence when speaking English.

Table four summarizes the drawbacks of utilizing AI in learning a foreign language. It should be mentioned that the overall feedback for the disadvantages were less than those detailing the advantages. Communicating with an AI has certain restrictions, as noted by 21 (60%) students in the low-level group and 22 (64.7%) students in the intermediate-level group. For example, some students found it uncomfortable to interact with an AI avatar for a long time because it was not a human being. Additionally, some of them were disappointed when the AI misunderstood what they were trying to communicate. A small number of intermediate-level students and seven (20%) low-level students expressed dissatisfaction in regard to speech recognition.

<table>
<thead>
<tr>
<th>Feedback for low-level</th>
<th>Feedback for intermediate-level group</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find it difficult to communicate for very long since I don't feel like I'm communicating with a human being.</td>
<td>I was annoyed when the Chatbot could not understand what I wanted to say.</td>
</tr>
<tr>
<td>The fact that AI misinterpreted my voice made me disappointed. I had the impression my pronunciation was not standard.</td>
<td>AI does not recognize my pronunciation.</td>
</tr>
<tr>
<td>Unfortunately, the AI failed to identify the grammatical faults or incorrect phrasing.</td>
<td>It was hard for me to understand which part of my message was incorrect.</td>
</tr>
<tr>
<td>No response</td>
<td>AI can’t answer all my questions, it is minimal.</td>
</tr>
</tbody>
</table>

Shortcomings associated with the use of Chatbots have been indicated in the works of previous researchers. Suggesting recommendations was the last question. Students' recommendations are shown in Table 13. The low-level group received 30 responses, while the intermediate-level group received 26. The AI application developers should update their products.
for better performance, according to suggestions made by ten (33.3%) students in the low-level group and eight (30.8%) students in the intermediate-level group. A lot of students stressed the fact that more linguistic data should be integrated into the AI. Students thought that the topics available to them when chatting with an AI Chatbot were limited, therefore offering a wide range of subjects can encourage them to participate in the conversation.

Table 5. Feedback from Students: AI Chatbot Suggestions

| The quality of Voice Chatbot is not as good, as the quality of text Chatbot | The topics for discussion are very limited. |
| It would be nice if Chatbots have more topics for discussion | It would be nice if I provided an alert for daily communication. |
| I think we should choose topics that are in the realm of AI | Voice Chatbots need to be improved. Sometimes, they can’t understand simple things. |
| In the passage of time, it is getting more boring to chat with AI. AI needs to enrich its functions. | AI Chatbots do not figure out my mistakes. It will be much better if Chatbots correct my texts. |

The present study's Chatbot recommendations are deeply connected to its earlier findings. The previous studies recommended to enhancing language proficiency. According to the prior findings, AI users would primarily benefit from grammar check, or spelling correction functions. There is no doubt that students’ interaction with AI Chatbots is beneficial in an EFL setting. These recommendations can offer some insights and prompts into how Chatbots can function more effectively for language learning, even if AI technology is still in its early stages of development.

Conclusion

The current study is designed to examine the impact of AI Chatbots in developing speaking skills, as well as to analyze the perceptions of learners on applying AI-powered voicebots in EFL classrooms. The outcomes of the research demonstrate that both teachers and students hold positive attitudes in terms of AI-based speaking tools skills acquisition. Undoubtedly, AI-based Chatbots significantly enhance students with their spoken procedures. With the help of AI voicebots students notably develop their speaking skills, enrich word banks, and ameliorate grammatical instructions and sentence formation. All the above-mentioned factors help the students to achieve their learning objectives respectively. Due to its real-time feedback, AI voicebots make speaking assignments more engaging, create an interactive learning environment and help students save time. This study found that AI Chatbots have a positive impact on foreign language learning, particularly in improving pronunciation, intonation, and stress. Students reported increased fluency and confidence in communication.
Endnotes

1. TalkPal is a GPT-powered AI language tutor. Chat about unlimited amount of interesting topics either by writing or speaking, while receiving messages with realistic voice. (AI Language Teacher - TalkPal, n.d.)
2. Bard has a share conversation function and a double-check function that helps users fact-check generated results.
3. The Dou Bao app is the AI project formerly codenamed "Grace" within ByteDance's internal development. Users can chat with Dou Bao, generating text content such as song lyrics, novels, copywriting, and language translation. Each response segment not only consists of text but also includes voice responses from Dou Bao. (豆包, n.d)

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Conflicts of Interest
The authors declare no conflict of interest.

Authenticity
This manuscript is an original work

Artificial Intelligence Statement:
Artificial Intelligence tools were not used.

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### Appendix

#### Students’ Feedback of AI Chatbots

<table>
<thead>
<tr>
<th>Feedback for low groups</th>
<th>Feedback for the intermediate group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicating with AI Chatbots improves my English speaking, and pronunciation.</td>
<td>Speaking in English is not something that most of my classmates like to do when we communicate in person, they prefer to use Chinese in daily communication, however, due to AI chatbots speaking engagement has drastically increased.</td>
</tr>
<tr>
<td>Stress free environment, you can speak to an AI Chatbot no matter whether your sentence is correct or not.</td>
<td>I can communicate in English as much as I want. I don’t have foreign friends. AI Chatbots provide me with an opportunity to develop my speaking skills.</td>
</tr>
<tr>
<td>No pressure, free to express what I want to express.</td>
<td>It was so fun to interact with AI. Sometimes I ask such funny and strange questions and AI responses are also amusing.</td>
</tr>
<tr>
<td>I feel excited when I am communicating with AI Chatbots.</td>
<td>AI enables me to learn valuable expressions which can be used in daily communication.</td>
</tr>
<tr>
<td>I used to be worried I would be wrong when I was speaking with people, but using AI allows me to be more confident and active.</td>
<td>I was able to become used to the phrase structure and pay attention to pronunciation during the conversation. AI Chatbots improve listening as well.</td>
</tr>
<tr>
<td>I can say whatever I want. No one is going to judge me.</td>
<td>AI Chatbots provide a solid background of daily communication.</td>
</tr>
<tr>
<td>I can practice my English any time I want.</td>
<td>I feel more confident now.</td>
</tr>
</tbody>
</table>