



Enhancing The Teaching And Learning Of English For Specific Purposes (Esp) With Chatgpt

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Abstract

As a result of the implementation of ChatGPT into interactive learning tools for technical English, students can participate in conversational engagements that are analogous to actual engineering challenges encountered in the real world. Through this conversational interface, individual students can ask engineering-related questions, obtain accurate and useful responses via ChatGPT, and even receive comments and explanations. For example, students may question the differences between a transistor and a diode. ChatGPT can provide a response that is both precise and condensed, such as the following: "A transistor is an electronic device that has three terminals and is used for amplification and switching, whereas a diode is a device that has two terminals and is used for rectification and voltage regulation." In addition, ChatGPT helps simplify the learning process by giving examples of conversations that have already taken place between customers and engineers. Students can enhance their grammar and pronunciation skills by working through these dialogues. Because of this integration, ChatGPT now serves as an engaging and personalized conversation companion, assisting students in developing their technical English language abilities. This functionality allows ChatGPT to behave more like a traditional discussion forum.

Keywords: ESP, ChatGPT, teaching, and learning.





INTRODUCTION

John McCarthy coined the term "artificial intelligence" (AI) in 1955. John McCarthy coined "artificial intelligence" to describe technology that can "use language, form abstractions, and concepts, solve kinds of problems currently reserved for humans, and improve itself." 2023; D. Kovaevi. Since then, artificial intelligence has advanced in the discipline of computer science. The computer science discipline that incorporates the development of intelligent devices and technologies capable of performing tasks that would otherwise require human intelligence is the one that best and most accurately defines artificial intelligence as such. A. Scribner, S. Taylor, K. Park, J. Lester, A. Ottenbreit-Leftwich, B. Mott, and S. Lee (2021). Technologies founded on artificial intelligence mimic human thought and behavior. by Kimura, D. At this time, AI studies, applications, and breakthroughs began to diverge, attracting academicians and researchers from various fields, not just computer science and engineering. Consequently, numerous diverse perspectives can be presented. Hussain, S., and Khan (2022) discovered that this led to numerous specialized uses of AI in education and related fields. To better support formal education and lifelong learning, artificial intelligence researchers investigate the many contexts, from home to the workplace, where learning occurs. It integrates AI, which is inherently interdisciplinary, with various learning sciences (including psychology, neuroscience, sociology, anthropology, and linguistics) to advance and contribute to the development of adaptive learning environments and other AI tools that are flexible, inclusive, personalized, engaging, and effective. The objective is to bridge the gap between AI and other diverse disciplines, including the learning sciences. This study was written by A. R. A. Taha, S. M. A. A. Ahmed, and S. Hussain in 2022. In the classroom, artificial intelligence (AI) generally refers to computer software designed to interact with the outside world, analogous to how the human mind would. This necessitates reliance on domain-specific data and the algorithms that enable its intelligent processing. The application of AI to language instruction and learning represents a portion of the expansion and development of computer technology in education in general and language classrooms in particular. This understanding is feasible because AI can be viewed as a component of computer technology's expanding and advancing use. Sumakul, Hamied, and Sukyadi provide an overview of the use of AI technology in language classes from 1960 to the present, with references to relevant literature and justifications for academicians' divergent perspectives and attitudes. This summary references relevant literature and the rationale for academics' divergent views. (2023) B. L. Moorhouse, D. Zou, and L. Kohnke. Several examples of their use in the classroom exist, and the most significant AI technologies in language education have been identified. NLP and ML (also known as textual AI and visual AI) are used in





various artificial intelligence (AI) applications to enhance education. In addition, apps for automated writing evaluation have been developed and implemented to aid students in enhancing their writing skills by providing corrective feedback. Chatbots propelled by artificial intelligence have also been implemented in language learning as conversational agents to tailor their assistance to readers and speakers. The development of individualized, AI-enabled, adaptive learning systems has also facilitated the acquisition of multiple foreign languages. In 2023, Su, H., Zhu, and Zhang, B. conclude that "efforts to embed AI into mobile technologies have yielded particularly exciting results." Continue by stating that there is a "strong demand to explore new AI applications that are effective in informal contexts" to "address the current language learning situation," which includes promoting the development and application of adaptive technologies so "learners can choose their learning content and methods and receive immediate feedback." English for Specific Purposes, which is defined as an "approach to language teaching that targets the current and future academic or occupational needs of learners, focuses on the necessary language, genres, and skills to address these needs, and assists learners in meeting these needs through the use of general and discipline-specific teaching materials and methods," it is essential to note that students are assisted in their pursuit of these objectives. This paper was written by L. S. Anthony, M. Vasudevan, V. Perumal, M. Ovinis, P. B. Raja, and T. N. J. I. Edison (2021).

AI-related technologies have the potential to be excellent educational tools. According to Istrate, ESP will shortly prioritize learning programs tailored to each student's prior knowledge. If e-learning chatbots are effectively integrated into artificially intelligent learning platforms at colleges, they could become a new fad and an effective way to teach ESP. Thanks to this innovative method and tools, people will have more opportunities to flourish by promoting their achievements. She continues by expressing her belief that recent advancements in artificial intelligence, specifically the application of chatbot technology in the context of academic ESP, could eventually result in a virtual assistant that could, in some cases, replace the human teacher by providing students with an interactive learning environment similar to that of working one-on-one with a human teacher. Imrate, A. M. (2018). In November 2022, OpenAI made a significant advancement by introducing ChatGPT. This created many opportunities for the use of artificial intelligence (AI) in creating and processing textual materials, thereby facilitating various aspects of ESP instruction and learning. The OpenAI team has created something with ChatGPT.





CHATGPT

OpenAI's chatbot is on display in ChatGPT and equipped with AI. It employs robust machine learning techniques to generate responses to text input that are strikingly similar to human responses. This enables it to have simple, natural conversations with humans. Throughout its development, it has received several updates and improvements that have helped it become one of the most advanced chatbots available today. In 2018, OpenAI developed a language model for AI called GPT (Generative Pre-training Transformer). ChatGPT may have some bearing on this new phenomenon. By analyzing a large corpus of text written by humans to understand the grammar and style of the language, GPT was developed to predict the next word in a given string of words. The technique's overwhelming success led to its rapid adoption in many fields, including machine translation, language acquisition, and musical composition. OpenAI built a chatbot that can hold genuine conversations with humans by building on the capabilities and success of GPT.

Therefore, at the beginning of 2020, ChatGPT was developed and made available to the public. It was trained on a massive dataset containing hundreds of billions of words, allowing it to create good English and perform various natural language processing tasks, including text completion, translation, question answering, and summarizing. The dataset used for training was quite substantial. Because it can generate human-like responses to text input, it can generate responses in a chatbot or virtual assistant to carry on natural conversations. ChatGPT uses powerful machine learning techniques to analyze the context and content of a conversation and provide appropriate responses. This feature is what makes ChatGPT so convincing as a human communication simulator. As a result, it can engage in conversation with humans in a more natural and fluid way than simply responding to predetermined keywords and phrases. ChatGPT's huge knowledge base is also a significant feature. Thanks to a large database of content created by humans, it can study language, culture, and other fields. In this way, ChatGPT can provide comprehensive and accurate responses to various questions. Because of these benefits can be used in many natural language processing tasks, such as text generation, query answering, and text classification Bylieva, D. (2022).

USE OF CHATGPT IN ESP TEACHING PROCESS

Due to the malleability and generative capabilities of the ChatGPT platform, students who take part in English for Specific Purposes classes can take advantage of interactive and individualized learning possibilities. The English for Specific Purposes lessons make these chances possible for the students. The instructors and educators who are in charge of working





with the pupils are the ones who create these possibilities. Because of the various experiences made available to students, they have the opportunity to develop the linguistic skills essential to their success in the subjects they choose to pursue. In this regard, ChatGPT lends itself exceptionally well to developing materials for the education of ESP in various settings across a broad spectrum of contexts.

Text Generation

One possibility is to change it to produce commercial, technical, or medical English to provide students with examples of the language they must understand in their business. Numerous techniques are needed for fine-tuning. To get the process started, a sizable dataset of texts from the target topic is gathered. You can get these details by searching websites, books, articles, and other publications in the chosen language. Data cleansing and preparation for training are part of preprocessing. Stop words, punctuation, and other components outside the target domain may be eliminated. The pre-trained ChatGPT model can be improved with the help of domain-specific data. By maintaining the previously instructed weights and only training the final one or two layers, transfer learning is utilized to adapt the model to the target domain. It's crucial to compare the generated text to the original data after corrections and evaluate the model's performance using metrics like accuracy, F1 score, and perplexity. The model's design or training approach can be adjusted in light of the assessment results, and the fine-tuning and evaluation phases can be repeated until the desired performance is reached. Practicing on a quick, powerful computer is preferable because fine-tuning can be time- and resource-consuming.

Generation of Vocabulary and Grammar Exercises

Developing customized grammar and vocabulary courses for ESP pupils is possible because ChatGPT can be trained to produce queries and responses based on certain grammatical structures or vocabulary concepts. The language model is adjusted using particular English as a Second Language (ESL) dataset. This requires several different modifications to the language model. A sizeable dataset of ESL exercises or sentences must be assembled, representing the vocabulary and grammar patterns that should be the study's primary focus. Before supplying the data to the model, it must be cleaned and preprocessed by removing any irrelevant information and organizing it. The chosen and carefully adjusted pre-trained language model must start with the gathered and preprocessed data. To accomplish this, the model must be trained using supervised learning on the new data. The model adjusts its parameters to





minimize the discrepancy between expected and obtained outcomes when given pairs of expected input and output values. It should be tested on a held-out validation set to determine how effectively the redesigned model can produce exercises that match the required grammar structures and vocabulary. It is also possible to utilize the enhanced model to produce assignments for each student or group of students by giving it a prompt or a partially formed phrase to finish using the desired vocabulary and grammar structures. The created exercises can be modified to fit the student's degree of ability, linguistic background, and particular needs. The students can use these as additional practice aids to improve their language abilities. The dataset's amount and the model's complexity will determine how long it will take to improve a language model, which could take several hours or even days.

Generation of Virtual Tutors or Chatbots

The creation of chatbots or virtual teachers who converse with students in a common language is another application for ChatGPT. This can help students improve their speaking and listening skills in a tailored, interactive environment. Several processes make up the process, the first of which is the (already mentioned) fine-tuning of the pre-trained ChatGPT model utilizing a significant dataset of ESL conversations or questions and answers relevant to the target vocabulary and grammar structures. The next phase is to create a dialogue management system, which will determine what the chatbot will say next and how it will react to user input. The system can employ various methods, including rule-based matching, intent categorization, and response generation, to guide the conversation and provide pertinent replies to the user-posted questions. The chatbot's responses should also be tailored using user-specific information, such as competency level, linguistic background, and specific needs, to suit the learner's goals better. Its performance should also be evaluated using a held-out test set to see how effectively the chatbot can manage various conversational circumstances and how much it can help pupils.

Integration into Interactive Learning Materials

ChatGPT can also be incorporated into interactive learning tools like quizzes or games tailored for each student depending on their language needs and ability to give students unique and exciting language learning experiences. To create this relationship, ChatGPT can be used to ask and answer questions and offer personalized comments and advice. Making ChatGPT compatible with interactive learning resources requires enhancing it using a huge dataset of ESL questions and answers. The software can generate original research questions on particular





grammatical and lexical structures. These created questions can be included in tests, games, or other interactive learning techniques to give the students individualized practice. The learning materials can be made more interesting by tailoring the questions to the student's growth and ability level. ChatGPT can also provide students with personalized feedback based on how they answer the questions in interactive learning materials. The model can be improved, and helpful feedback on grammatical, lexical, or phonetic difficulties can be produced using a collection of feedback and corrective examples. It provides advice for improvement based on how the student performs. Along with questions and comments, ChatGPT also allows for creating student recommendations. For instance, the model might suggest books, movies, or other materials to help pupils improve their linguistic abilities.

Creating recommendations based on the student's interests and language skills may make the learning experience better and more suited to their needs. What was indicated in the previous phrase is illustrated by the use of ChatGPT in conjunction with interactive learning materials for technical English. ChatGPT allows individual students to communicate and improve their technical English by providing a conversational interface. The conversational interface can stimulate queries about engineering, and ChatGPT can provide the appropriate explanations, defenses, and responses. One that a student might type is, "What is the difference between a transistor and a diode?" According to ChatGPT, a transistor is a three-terminal electrical component used for amplification and switching. In contrast, a diode is a two-terminal electronic component used for rectifying and regulating voltage. By providing instances of discussions between engineers and clients, pointing out errors in the students' grammar and pronunciation, and providing quick feedback, ChatGPT can serve as a conversational companion for students, delivering personalized language learning experiences.

Providing of Instant Feedback and Evaluation

Lastly, the real-time feedback and evaluation provided by ChatGPT can help ESP students enhance their language skills. Modify the model using a variety of critiques and corrective examples. Again, the first stage is to collect many comments and corrected examples for grammar, vocabulary, and pronunciation issues in ESP learning. This data should be preprocessed before being divided into input and target to standardize the format and eliminate extraneous data. The objective is feedback or correction; the error-containing text is the input. Using TensorFlow or PyTorch, the pre-trained ChatGPT model can be enhanced using these data. During fine-tuning, the model predicts input data and modifies parameters to decrease the disparity between its predictions and the target feedback or correction.





Backpropagation modifies the model's parameters, whereas a loss function computes the difference between the model's predictions and the intended feedback or correction—an illustration of fine-tuning. The objective is to enhance the pre-trained ChatGPT model to correctly anticipate grammatical errors in the statement "I went to the store" The dataset should be separated into input and target data, where input is the sentence containing the grammatical error, and the target is the correct text. After importing this dataset into a deep learning framework, the pre-trained ChatGPT model can forecast input data. Using loss functions, the forecasts and the target data will be compared. The backpropagation algorithm forecasts incoming data and modifies model parameters to reduce the loss function. Sentence by sentence, the dataset will be analyzed until the model correctly identifies grammatical errors. A held-out test set should evaluate the model's accuracy, recall, and precision in providing beneficial feedback and corrections after adjusting it.

After the model has been tweaked and evaluated, it could be incorporated into a web or mobile application that provides instant feedback and evaluations of students' language skills. Students can submit their work, and the model will provide immediate feedback and corrections to assist them in acquiring language skills rapidly. The model can be trained to generate precise, accurate, and useful corrections and feedback for ESP students, providing immediate and individualized feedback on their language proficiency. In a technical English course, ChatGPT can provide students with immediate feedback on their writing projects and assist in developing their technical writing abilities. After students submit their written assignments, ChatGPT may evaluate them for grammar, vocabulary, and sentence structure. It can then provide immediate feedback on the student's writing skills, including assets and weaknesses. When a student writes a technically incorrect or unclear statement, ChatGPT can indicate the issue and propose a solution. Still, it can provide explanations and examples to help the student understand and avoid errors. ChatGPT customizes learning paths based on students' strengths and weaknesses and monitors their development. Students who struggle with technical accuracy may benefit from the additional assignments and resources provided by ChatGPT.

CONCLUSIONS

If their teachers and educators make use of the incredible tool that is ChatGPT, students taking English for Specific Purposes (ESP) will have the opportunity to benefit from learning experiences that are both one-of-a-kind in how they are catered to their interests and extremely participatory. Because of its malleability and generative features, it offers many alternatives to





teachers and educators, allowing them to build personalized and engaging learning experiences for students of English for Specific Purposes. The adaptability of the system makes this outcome a real possibility. The adaptability and generative capabilities of the model can be utilized in a variety of different ways, including the fine-tuning that enables the generation of text in specific domains, the creation of personalized vocabulary and grammar exercises, virtual tutors or chatbots, and the incorporation into interactive learning materials such as quizzes or games. These are just a few examples of how these capabilities can be used. These are only some of the many applications that can be found for such capabilities. However, it is essential to remember that to use ChatGPT in teaching ESP; the user must possess a certain level of computer proficiency. This fact is essential to keep in mind. This category includes the knowledge of fundamental computer operations, such as how to install and operate software and navigate the Internet and use tools based online. In addition, this category also includes the knowledge of how to utilize tools based on the web. In addition, knowing text-based programming languages such as HTML, Markdown, Python, and JavaScript could prove useful when customizing ChatGPT or integrating it with other learning platforms already in place. Those interested in acquiring a deep grasp of how ChatGPT operates and how to apply it in a classroom setting would benefit from having prior familiarity with techniques and concepts connected to machine learning and natural language processing. ChatGPT is a computer program that helps teachers evaluate students' comprehension of complex topics by analyzing their written and spoken language. Suppose the language instructor needs to have the necessary computer capabilities. In that case, it is essential to collaborate with a professional IT expert to realize the objectives and outcomes connected to ChatGPT that were established for ESP training. These goals and outcomes are related to the ESP instruction process. Fine-tuning might take a lot of time and requires a significant number of computer resources, which is an important point to keep in mind. Despite this, the benefits of a perfected ChatGPT model, which include providing students with effective and personalized experiences in language acquisition, make it desirable to invest both resources and effort to achieve the goal. In the English for Speakers of Other Languages (ESP) classroom, ChatGPT can assist teachers and educators in assisting their students in obtaining the language skills necessary for success in their various fields and in reaching their full potential. In general, ChatGPT's versatility and its generative characteristics make it a useful tool for generating engaging and individualized ESL instructional materials. As a result of these capabilities, ChatGPT is an extremely useful instrument for generating interactive and personalized ESL teaching materials.





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