

EXPLORING THE USE OF CHATGPT IN LESSON PLANNING: POSSIBILITIES, EXPERIENCES, AND LIMITATIONS

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ABSTRACT

This reflective paper explores the use of ChatGPT, a powerful large language model (LLM) developed by OpenAI, as a tool for lesson planning. ChatGPT's ability to generate coherent and relevant responses has the potential to enhance teaching practices. The paper discusses ChatGPT's capabilities, including answering questions, explaining concepts, generating sample sentences, proofreading, and suggesting resources. It highlights the author's experiences using ChatGPT for topic suggestions and summarizing complex concepts. The paper also addresses some limitations of the software, such as the occurrence of hallucinations and inaccuracies. Educators are advised to exercise caution and critical judgment when using ChatGPT's output. The importance of combining AI tools with human expertise and judgment in order to teach effectively is emphasized.

INTRODUCTION

With the rapid advancements recently made in artificial intelligence (AI) technology, the field of education has witnessed the emergence of innovative tools with the potential to enhance the teaching and learning experience. One such tool that has gained significant attention is ChatGPT, a powerful large language model (LLM) developed by OpenAI. With its ability to generate coherent and contextually relevant responses, ChatGPT has the

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potential to be useful in many teaching applications, including lesson planning.

In this reflective paper, I will explore and reflect upon my experiences and impressions of using ChatGPT as a tool to assist in lesson planning and materials development: the methods and prompts used, the output received, and my evaluation of its benefits and drawbacks.

While this paper will focus on ChatGPT, most of the information herein also applies to other, similar LLMs such as Google's Bard, Anthropic's Claude, and Microsoft's Bing Chat. The abilities of these applications, as well as their benefits and drawbacks, are similar to those of ChatGPT.

BACKGROUND

Many popular AI software applications use artificial neural networks, a category of artificial intelligence algorithms which are inspired by the biological neural networks found in the brains of animals (Yang & Yang, 2014). A neural network "learns" through mimicking the processes of physical neurons: it is presented with inputs which it measures and then outputs a response, depending on a designated threshold (Krogh, 2008). For example, a neural network might be shown pictures of animals and tasked with determining whether or not each animal is a cat, based on defined parameters of a cat's appearance. When this is done many times, it is referred to as "training" or "learning"; it resembles the natural processes of the brain which take place when something is learned (Krogh, 2008).

Natural language processing (NLP) has advanced quickly over the past several years, leading to improved performance on real-world tasks such as summarization, translation, and text generation (Rahman & Watanobe, 2023). One method of improving NLP performance has been to pre-train an AI model on a large text corpus, followed by fine-tuning of the results to improve the model's performance on a specific task (Brown et al., 2020). This method is used in the Generative Pre-Trained Transformer (GPT) model on which ChatGPT is based. The model currently used in the free version of ChatGPT (GPT-3.5) was trained on approximately 570GB of text, with 175

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billion parameters (Rahman & Watanobe, 2023). The current free version has a cutoff date of January 2022, which means the model knows little to nothing about anything which has since occurred.

CHATGPT'S ABILITIES AND POTENTIAL USES

The large size of ChatGPT's training model gives it the ability to receive prompts written in natural language and quickly give an appropriate response. It can answer questions, generate texts, translate languages, summarize texts, and explain concepts. While its ability to carry out these tasks varies, in general the software is quite capable. It is also quite simple to use, requiring only basic computer skills.

ChatGPT has many potential applications for second language teachers. Its ability to answer questions in natural language and explain concepts means that it can provide explanations of grammatical rules and concepts, as well as definitions of vocabulary. It can also suggest synonyms, antonyms, and example sentences, as well as general information about word frequency. This has potential uses for any course in which vocabulary is a key element. The software can also interact with the user by providing quizzes; it is possible to request ChatGPT to provide definitions of words (for example, from the Academic Word List), whereupon the user attempts to guess the correct word. This can also be done in reverse: ChatGPT gives the target word, and the user provides the definition. In the latter case, ChatGPT will evaluate the user's definition using phrases such as "quite accurate" or "generally accurate" while also providing its own definition.

ChatGPT can also generate sample sentences and paragraphs on random or user-defined topics. In addition, it can create exercises or worksheets based on specific points of grammar for student practice. This could be useful in teaching contexts where textbooks are unavailable or unsuitable. The quality and usefulness of these sample sentences depends largely on the prompt given; a vague prompt may result in unsuitable examples.

ChatGPT can also proofread documents and identify errors, as well as suggest improvements. It can give feedback on overall coherence as well as

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grammar and sentence structure. This has the potential to be useful in writing-based courses.

The software can also suggest language-learning resources such as websites, applications, and books which can serve as a supplement to the teacher's existing knowledge. It will offer direct links to online resources when requested to do so.

In addition, ChatGPT can assist with brainstorming and can generate lesson plans, activities, discussion questions, and project ideas. It can create different kinds of activities for various group sizes, focused on different topics and learning outcomes.

These capabilities give ChatGPT the potential to quickly and easily create original, highly customized learning materials which are targeted at learners' needs, allowing teachers a high degree of flexibility (Mikeladze, 2023).

EXPERIENCES USING CHATGPT IN LESSON PLANNING AND MATERIALS CREATION

Upon familiarizing myself with ChatGPT and its potential uses in lesson planning and materials creation, I began to use the software by asking for suggestions for topics to cover. One course I teach is a CLIL course on ethics and moral philosophy. As part of the introductory unit in this course, the students learn about the earliest attempts to study the topic of ethics. I asked ChatGPT to give examples of pre-Socratic ideas of ethics, and it was able to provide several topics which I was able to research and incorporate into my lessons. These topics have helped make the course more thorough, and have been interesting for the students to discuss.

I have also had success using ChatGPT for summarizing and simplifying texts. Many courses I teach use slides during lessons; the aforementioned ethics and moral philosophy course is one of these. With the complex, abstract topics used in this course, it is important for the slides to be kept as simple as possible. With this in mind, I have often used ChatGPT to summarize paragraphs I have written on a topic, specifically in point form. I

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specify in the prompt that the points should be as simple and concise as possible. I have found that ChatGPT is generally quite effective at this; the output is as desired and works well in the classroom.

In general, my experiences of using ChatGPT for lesson planning and materials creation have been positive. I have been able to save time by having ChatGPT carry out these tasks rather than doing them myself. This has allowed me to spend more time on other tasks: locating, evaluating and selecting materials, reviewing and revising activities, and creating assessments.

LIMITATIONS OF THE SOFTWARE

Hallucinations

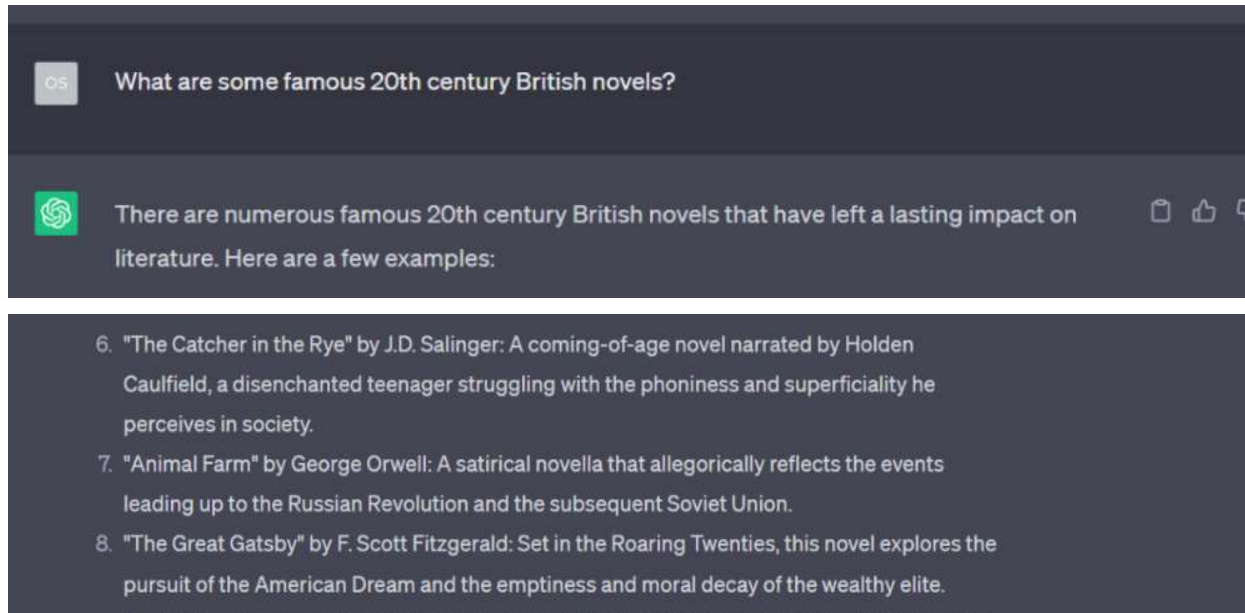
While ChatGPT and other modern LLMs are very impressive, they are not without limitations. Below ChatGPT's input window, there is a message which (at time of writing) reads: "ChatGPT can make mistakes. Consider checking important information". Bard, Claude, and Bing Chat have similar warnings. These messages serve as a reminder that teachers should not place too much confidence in a LLM's ability to deliver accurate information, and should not assume all output will be usable.

LLM-based chatbots will confidently deliver factually incorrect responses; they are largely incapable of admitting they do not have the requested information. In the field of AI, these responses are known as "hallucinations": answers not justified by the model's training data and with no basis in fact (Ji et al., 2023). This can be extremely problematic for teachers as it creates the potential for false information to be directly or indirectly conveyed to learners.

The most common variety of hallucination is when the AI simply provides inaccurate information as fact. As a test, I asked ChatGPT to name some famous 20th century British novels. It returned a list of ten novels, eight of which would meet the requested criteria, but included the American novels *The Catcher in the Rye* and *The Great Gatsby*, as can be seen in items 6 and 8 in Figure 1 below.

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Figure 1: ChatGPT hallucinates a response to a user question (OpenAI, 2023).



When informed that two of the authors were not British, ChatGPT acknowledged its error, but then incorrectly identified the two non-British authors in the list. It took several attempts before the AI was able to (separately) identify the two non-British novels in the original list (see Appendix for full transcript). In a subsequent test, it included a novel from 1851 in a list of 20th century works. A user unaware of these inaccuracies might accept these errors as fact, and pass on this incorrect information to learners.

Another type of hallucination involves summarizing. As ChatGPT is unable to search for information on the internet, it should not be able to access web links submitted by a user. Previous versions of ChatGPT would, however, hallucinate responses when given a web link. For example, if a user asked ChatGPT to generate discussion questions based on a news article, and provided a URL, the AI would generate questions despite being unable to access the text itself. This problem appears to have been resolved, and ChatGPT now acknowledges its inability to access the internet directly. It

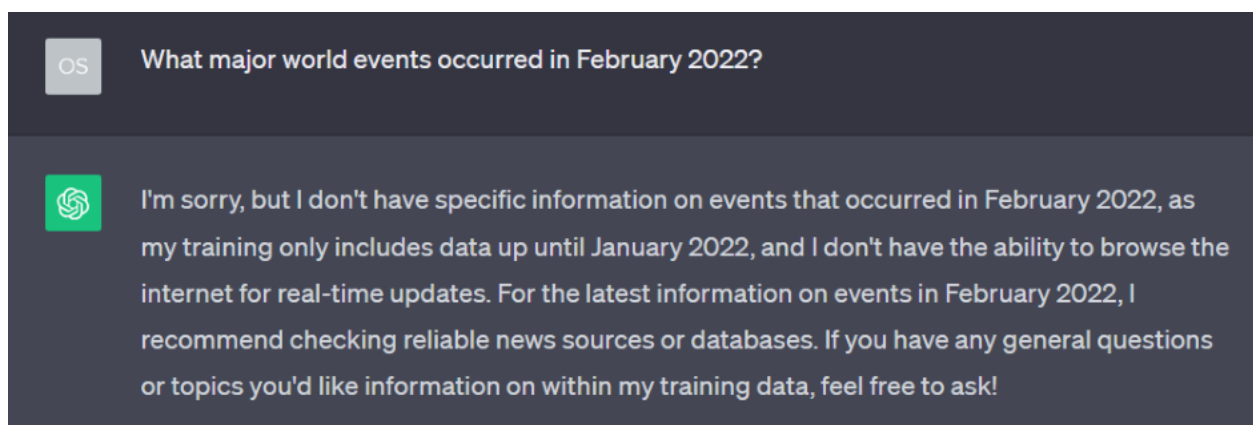
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instead requests the user to provide the text of the article itself in order to generate a response. AI chatbots which are able to search the internet directly, such as Bard and Bing, have not suffered from this problem.

Hallucinations may also create difficulties in using LLMs as tools to help with research. When asked for suggestions for articles, books, or other resources on a given topic, ChatGPT will create citations for entirely fictitious publications. This is especially true of journal articles. The authors and/or journals may be real, but the articles themselves are non-existent. This could potentially lead to frustration as users fruitlessly search for articles which they have been led to believe will be useful. A teacher intending to use ChatGPT to find sample articles for students, for example, would be well-advised to keep these limitations in mind.

In addition, as previously mentioned, the free version of ChatGPT has only been trained on information up to January 2022 at the time of writing. As a result, the software is generally unable to give any information about most events which have occurred since then. However, in contrast to the examples discussed above, ChatGPT will state that it cannot answer questions about events after this date, rather than hallucinating a response (see Figure 2 below).

Figure 2: ChatGPT's response to a question about events occurring after January 2022 (OpenAI, 2023)



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In this case, ChatGPT explicitly acknowledged its inability to answer the question, clearly stated the reason, and suggested alternative ways for the user to find an answer.

Other issues

As previously stated, ChatGPT is able to provide feedback on written work. It claims that it can review writing and provide constructive feedback, suggest revisions, and offer alternative phrasing. In practice, its ability to do this is inconsistent. Even when presented with examples of poorly written paragraphs, the software will often respond mostly with praise, and tell the user that the paragraph is well-written. ChatGPT will only be critical when it is presented with a text with numerous, major errors.

It appears that ChatGPT mainly focuses on spelling and grammatical errors, rather than content or structure. If the writing is reasonably clear, and free of errors, ChatGPT's response will be mostly positive. This may be an issue with the prompts used; when testing this aspect of the software, I have mainly asked for overall feedback. In general, however, it appears that ChatGPT is not entirely reliable at this task.

CONCLUSION

ChatGPT is a valuable resource for teachers. Its ability to receive prompts and then output responses in natural language makes it very easy to use. Its vast training data allows it to converse on almost any topic and carry out tasks which were previously impossible for anything other than a human. This makes ChatGPT a very useful tool for teachers (and learners) of any sort. The assistance the AI can provide has the ability to make many aspects of teaching proceed more smoothly. My own personal experiences with the software have shown me that it can be useful.

However, despite its impressive capabilities, ChatGPT is not without limitations. One significant concern is the occurrence of hallucinations and factually incorrect responses. These pose a real risk of conveying false information to learners, emphasizing the need for caution when using the

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AI's output. ChatGPT is also not equally skilled at all tasks; some, like writing feedback, are less strong than others.

To make the most effective use of ChatGPT, it is important for educators to be aware of its limitations and exercise critical judgment when interpreting and using its responses. Over-reliance on the software would be unwise; it is important for teachers to keep in mind that ChatGPT is a tool and can assist in lesson planning, but is not a substitute for a teacher's knowledge and experience.

As AI technology continues to advance, it is likely that tools like ChatGPT will become more refined and reliable. However, it is crucial to maintain a balanced approach and supplement the use of AI tools with human expertise and judgment. The overall goal should be to combine the strengths of technology and human insight to create engaging and effective lessons that empower students and give them the skills needed to thrive in an increasingly digital world.

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APPENDIX

ChatGPT Transcripts

Figure 1. ChatGPT Hallucination Transcript

User: What are some famous 20th century British novels?

ChatGPT: There are numerous famous 20th century British novels that have left a lasting impact on literature. Here are a few examples:

1. "1984" by George Orwell: A dystopian novel exploring themes of totalitarianism, surveillance, and psychological manipulation.
2. "To the Lighthouse" by Virginia Woolf: A modernist novel that delves into the inner lives and thoughts of its characters, focusing on themes of time, perception, and gender roles.
3. "Brave New World" by Aldous Huxley: Another dystopian novel depicting a future society where technology, consumerism, and genetic engineering dominate.
4. "Lord of the Flies" by William Golding: A compelling allegorical novel that examines human nature, civilization, and the inherent capacity for evil in a group of boys stranded on an uninhabited island.
5. "Mrs Dalloway" by Virginia Woolf: A stream-of-consciousness novel that delves into the thoughts and experiences of the characters over the course of a single day in post-World War I London.
6. "The Catcher in the Rye" by J.D. Salinger: A coming-of-age novel narrated by Holden Caulfield, a disenchanted teenager struggling with the phoniness and superficiality he perceives in society.

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7. "Animal Farm" by George Orwell: A satirical novella that allegorically reflects the events leading up to the Russian Revolution and the subsequent Soviet Union.
8. "The Great Gatsby" by F. Scott Fitzgerald: Set in the Roaring Twenties, this novel explores the pursuit of the American Dream and the emptiness and moral decay of the wealthy elite.
9. "A Clockwork Orange" by Anthony Burgess: A dark and controversial novel set in a dystopian future, examining free will, ethics, and the potential for rehabilitation.
10. "The Remains of the Day" by Kazuo Ishiguro: A poignant novel that delves into themes of regret, loyalty, and personal identity through the introspective reflections of a butler.

These are just a few examples of the many remarkable British novels from the 20th century, each contributing to the rich literary heritage of that era.

User: Two of those authors are not British.

ChatGPT: You're right, and I apologize for the oversight. Aldous Huxley and Kazuo Ishiguro are not British authors. Aldous Huxley was born in England but later became a naturalized citizen of the United States, and Kazuo Ishiguro is a British author of Japanese descent. Thank you for pointing that out, and I apologize for any confusion caused.

User: Those are not the two I was talking about.

ChatGPT: I apologize for the misunderstanding. If you were referring to authors who are not British among the mentioned novels, then the two authors would be George Orwell and J.D. Salinger. George Orwell was born in India (which was part of the British Empire at the time) and was of British nationality, while J.D. Salinger was an American author.

User: Salinger was one. There is one other American author in your list.

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ChatGPT: Apologies for the oversight once again. The other American author on the list is F. Scott Fitzgerald, who wrote "The Great Gatsby." Thank you for pointing that out, and I apologize for any confusion caused.

Figure 2. ChatGPT's response to a question about events occurring after January 2022

User: What major world events occurred in February 2022?

ChatGPT: I'm sorry, but I don't have specific information on events that occurred in February 2022, as my training only includes data up until January 2022, and I don't have the ability to browse the internet for real-time updates. For the latest information on events in February 2022, I recommend checking reliable news sources or databases. If you have any general questions or topics you'd like information on within my training data, feel free to ask!