

Unmasking ChatGPT:
The Challenges of Using Artificial Intelligence for Learning Vocabulary
in English as an Additional Language

by

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B.A. University of Victoria, 2021

A Thesis Submitted in Partial Fulfillment of the
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Abstract

Through this thesis, presented in the form of a book, I examine the use of ChatGPT, a conversational AI tool, as a tutor for learning vocabulary in English as an Additional Language (EAL). The goal is to inform educators and learners about the role of AI in language pedagogy. I begin by examining how ChatGPT lies at the junction of technology, EAL pedagogy, and content knowledge (Chapter 2). I then conduct my own exploration of ChatGPT through a series of interactions that show where it succeeds and where it fails, focusing on vocabulary learning for English for Specific Academic Purposes (ESAP) (Chapters 3, 4, and 5). Throughout my exploration, I provide commentary on ChatGPT's embedded cultural and linguistic biases, grammatical inaccuracies, and misinformation. The analysis of the interactions highlights the risks of using ChatGPT as a language tutor, due to technological challenges, pedagogical limitations, and content accuracy issues, especially in field-specific vocabulary. Ultimately, the recommendation is that ChatGPT should only be used for language learning by, or under the supervision of, individuals who are knowledgeable in technology, pedagogy, and content, and aware of the ethical considerations of AI (Chapter 6).

Contents

Supervisory Committee	ii
Abstract	iii
Table of Contents	vi
List of Figures	vii
List of Tables	viii
Acronyms	ix
Introducing the Book Format	xi
1 Introduction	1
2 Background	5
2.1 ChatGPT and AI Technology	6
2.2 ChatGPT in Education	10
2.3 Historical Context of EAL Teaching Methods	12
2.4 Vocabulary Acquisition Strategies	15
2.5 ESAP	16
2.6 Mobile Assisted Language Learning (MALL)	18
2.7 ChatGPT in LL	21
2.8 Summary and Research Question	22
3 Overarching Methods	24
3.1 ChatGPT Interface	24
3.2 Contextualizing the Interactions	25
3.3 References to Hypothetical Learners	27
3.4 About the Exploration	27

4	General Exploration	29
4.1	Unguided Materials for a Beginner Independent ESL Learner	30
4.2	Providing Information on Language Proficiency Tests	32
4.3	General Vocabulary	33
4.4	An EGP Language Tutor?	49
5	ESAP Exploration	51
5.1	Transitioning to Field-Specific Vocabulary	51
5.2	ESAP Exploration Methods	55
5.3	Learners Using ChatGPT for ESAP Vocabulary	60
5.4	An ESAP Language Tutor?	68
6	Discussion	70
6.1	Can ChatGPT be used for Language Learning?	70
6.2	On the Importance of the TPCCK Framework	72
6.3	Limitations of the Research	72
6.4	Continuous Development of ChatGPT	75
6.5	How can ChatGPT be a Better Language Tutor?	76
6.6	Why Limit ChatGPT's Improvement?	78
7	Conclusion	79
	References	81
	Glossary	87
	Appendix	90
	A: ChatGPT's Language Fluency	91
	B: Schmitt's Taxonomy of Vocabulary Learning Strategies	93
	C: ChatGPT Interface (iOS)	95
	D: Define Top Ten CSAVL Words	96
	E: Online Graded Text Editor (OGTE)	98
	F: ChatGPT- Generated Syllabi	99
	G: ChatGPT Supported Countries	102
	H: What's in a Word	103
	I: Examples of Associations for 'Cloud'	104

J: ChatGPT Explains the word <i>cloud</i>	105
K: Investigating Default Register in Meaning Explanations	106
L: CEFR Assessment with ChatGPT-4	107
M: ChatGPTs English Coverage Tests	108
N: Analyze Roots of 'Algorithm' - Extended	111

List of Figures

1.1	ChatGPT Fact Warning -October 2023	3
1.2	ChatGPT Fact Warning November 2023-present	3
2.1	Venn diagram of the field of NLP at the intersection between computer science and linguistics.	6
2.2	Virtual assistants	7
2.3	Hierarchy of AI concepts	8
2.4	Theory of Communicative Competence	15
2.5	English Language Purposes	17
2.6	Technological Pedagogical Content Knowledge (TPCK) framework	19
2.7	EU digital competence areas for citizens	20
2.8	CEFR scale	21
3.1	ChatGPT Browser Interface	24
3.2	ChatGPT Custom Settings Windows	26
4.1	OpenAI Admits ChatGPT Bias in Tweet	41
4.2	International Phonetic Alphabet Vowel Chart	41
5.1	Dictionary.com Entry for ‘cloud’	53
5.2	Google search “define cloud”	53
5.3	ChatGPT Generating an Image for ‘node’ from a Text Prompt.	66
6.1	EU Digital Competence Framework	72
7.1	ChatGPT mobile interface	95
7.2	Online Graded Text Editor Interface	98

List of Tables

4.1	Factors of Word Position.	34
4.2	Accuracy of Grammar Assessment	37
4.3	Factors of Word Form.	38
4.4	Factors of Word Function.	43
5.1	Factors of Word Meaning.	51
5.2	Word Associations for ‘cloud’	52
5.3	UVic English Language Proficiency Test Requirements	56
5.4	English Proficiency Coverage Ratings Test	59
7.2	A Taxonomy of vocabulary learning strategies	93
7.3	Components of Word Knowledge	103
7.4	Extended Examples of Word Associations for ‘Cloud’	104

Acronyms

AI	artificial intelligence
ALL	Additional Language Learning
ALLT	additional language learning and teaching
API	Application Programming Interface
CEFR	Common European Framework of Reference for Languages
CLT	Communicative Language Teaching
CS	computer science
CSAVL	Computer Science Academic Vocabulary List
DET	determination
EAL	English as an Additional Language
EAP	English for Academic Purposes
EGP	English for General Purposes
ESAP	English for Specific Academic Purposes
ESP	English for Specific Purposes
FCE	Cambridge First Certificate in English
GEC	Grammatical Error Correction

gpt	Generative Pretrained Transformer
IELTS	International English Language Testing System
IPA	International Phonetic Alphabet
L1	first language
L2	additional language
LL	language learning
LLM	large language model
LM	language model
MALL	Mobile Assisted Language Learning
ML	machine learning
NLP	natural language processing
RL	Reinforcement Learning
SLL	second language learning
STT	speech to text
TLM	Transformer Language Model
TTS	text to speech
UI	user interface

Introducing the Book Format

FEATURE BOXES Throughout the remainder of the book you'll encounter the following feature boxes designed to highlight specific information. Each are shown below with a brief mention of their purpose.

Technology exploration

Tech Spotlight

The Tech Spotlight box will contain additional information about technology. It is tangential information, but provides further details on technologies should the reader be interested.

Dialogue examples

Throughout the book, primarily in Chapters 4 and 5, examples of dialogue between ChatGPT and myself will be provided, verbatim, in the following format:

Dialogue Box (gpt Model) [mm-dd-yy]

LL

This box illustrates dialogue between myself and ChatGPT. This is the text that I provide to ChatGPT.

CG

This is the text response I receive from ChatGPT based on the information I provided it with.

Example titles contain “ChatGPT-3.5” or “ChatGPT-4”, which model of gpt was being used for the chat. They also include the date when the dialogue occurred. It's in a month-day-year (mm-dd-yy) format.

Supporting Quote

These boxes will contain quotes relevant to the content of the section, but not providing supporting evidence for an argument I aim to make.

Title of quote

Critical Thinking

Try this

Boxes like these pose a question triggered by a finding or statement in the text, with possible answers to the question.

A. Option 1

B. Option 2

C. Option 3

The options will then be discussed.

*Provoking Thought***Consider...**

This box will contain a thought provoking concept for the reader to ponder.

TIPS FOR USING CHATGPT

Tips on how to use ChatGPT will appear in margin notes unless they are wordy by necessity.

TEXTUAL CONTENT

gpt, the large language model ChatGPT is built on (discussed in Chapter 2.1.4) is typically written in caps, as GPT. OpenAI has recently released a new easy-to-use consumer tool that allows users to customize and share their own version of ChatGPT, called GPTs. I have chosen to differentiate the two by referring to gpt - OpenAI's large language model - in lower-case, and GPTs (or singularly GPT), the consumer tool, in upper case. GPTs will be touched on throughout the book in margin notes, and in the Discussion (Chapter 6).

MARGIN NOTES contain various information.

- Feature boxes
- Extraneous quotes which are representative, but not a supporting argument, of the topic of the neighboring body text
- Figure and table numbers, titles, and notes
- Definitions (all are additionally included in the Glossary)
- Extraneous information which would typically exist in footnotes
- Recommendations for further reading
- References to Appendices (occasionally referenced in the body text)
- Supporting figures (Large figures will appear in the body text)

The behaviour of ChatGPT has drastically changed - often evolving, occasionally devolving - during the eight months I wrote this book. In some cases I have updated the examples, in others I have not. Margin notes also include mention of some of these discrepancies.

ChatGPT Tip

These boxes contain tips to to optimize the use of ChatGPT, or understand why it might have succeeded or struggled at a certain task.

1

Introduction

ChatGPT seemingly came out of nowhere in December, 2022. It's been famed to aid anyone with a web browser and internet connection to execute and automate tasks or queries, including in the workplace and academia, apparently regardless of one's *digital competence*. However compatible, ChatGPT is being used for a wide range of tasks, including but not limited to language learning (LL) (Dac Lai et al., 2023; Wang et al., 2023). This introductory chapter lays the groundwork for understanding the role and implications of using ChatGPT in the realm of language learning, particularly focusing on its capabilities and limitations in aiding English as an Additional Language (EAL) and English for Specific Academic Purposes (ESAP) learners.

ChatGPT, a web interface developed by OpenAI, uses natural language processing (NLP) - a branch of artificial intelligence (AI) - and specifically large language model (LLM) technology to understand and generate text with near human-like responses. People can converse with it, ask for information, translate text between languages, get help with proofreading, or virtually anything else related to written language (OpenAI, 2022c). ChatGPT is trained by taking a plethora of **open-source** texts from across the internet in multiple languages on myriad subjects, and finding patterns using machine learning. All of this will be explained in Chapter 2.

ChatGPT has been widely adopted in academic settings (Intelligent, 2023) pushed for by OpenAI, ChatGPT's parent company (Tong, 2023), especially by students, due to its guileful mimicry of human language leading individuals to believe it can communicate as a human, despite being capable only of imitation (Bender & Koller, 2020). This widespread adoption of ChatGPT, despite its revolutionary capabilities, has sparked debate among educators and technologists about the efficacy and ethical implications of using AI in educational settings (Williams, 2023), particularly in LL (Kohnke et al., 2023).

From many of my personal communications and reading public discourse online it seems that folks tend to overgeneralize ChatGPT's ca-

Digital Competence is discussed in Chapter 2.6.4.

Paid subscribers of ChatGPT are now able to interact with ChatGPT in more ways than text, including voice and image exchange.

Open-source: Software for which the original source code is made freely available and may be redistributed and modified

ChatGPT will occasionally remind the user that it is a large language model, not a human. Nevertheless it takes on a human-like persona, speaking in first person point of view and directly addressing the interlocutor in second person.

pabilities based on an understanding of other NLP tools and the hype surrounding them, rather than on an understanding of their capabilities. That is, the less individuals understand NLP and AI, the more capable and cognitively sophisticated they assume ChatGPT to be, and the less they question its behaviour. This observation is without empirical substantiation, but is echoed by philosophers and industry leaders (Bender, 2023; Chomsky et al., 2023) and nonetheless played into the motivation to write this book.

CATALYST.

I initially set out to develop a resource for learners and educators of EAL that provides examples illustrating how ChatGPT can be used as an EAL tutor. I had observed ChatGPT being used for this purpose, but in ways that tended not to be grounded in additional language learning and teaching (ALLT) research, and without fact-checking. Those I saw using ChatGPT for language learning weren't only vloggers on youtube, but also by fellow student teachers and language learners alike. Accepting that ChatGPT will be continued to be used as an EAL tutor, I intended to provide a review of academic research on ALL in which examples of dialogue between ChatGPT and myself would be grounded. Examples would illustrate where ChatGPT could be useful, along with helpful suggestions for improving its role as a language tutor. However, through dialogue exploration of its behaviour, I came to realize that I instead needed to be able to answer two fundamental questions: **Can ChatGPT be used for LL?** and consequently, **Should ChatGPT be used for LL?**

I am presenting this thesis in the form of a book to increase accessibility for learners and educators of additional languages alike, and write it in a style that serves them. A goal of this book is for learners and teachers to glean more insight into, and understanding of, ChatGPT's behaviour, and grasp the need to weigh its apparently myriad capabilities against its sometimes camouflaged limitations.

I present an exploration of ChatGPT's features, limitations, and how it performs in different language learning contexts, namely EAL learning pronunciation, assessment of prescriptive grammar, and learning vocabulary in ESAP. The overarching context is ALLT, particularly in EAL, and narrowly with tasks for English for General Purposes (EGP) and ESAP. Explorations are presented in each of these contexts to show how ChatGPT embeds cultural and linguistic biases into its responses, and how its responses are additionally rife with false grammatical information, thwarted semantic interpretation, and misinformation regarding the meanings of field-specific words, also known as *jargon*.

I want to make clear that I don't condemn the use of ChatGPT in general. I believe it is a highly useful tool under the right circumstances.

It is important to understand the limitations of LLMs and put their success in context. This [...] helps reduce hype which can mislead the public and researchers themselves regarding the capabilities of these LLMs.
-Bender & Koller (2020)

Throughout this text, the term 'book' will be used to refer to to this thesis.

Fact goes for anything, including but not limited to accuracy of language translations, and words' grammatical features, semantic interpretations, and word meaning.

I am also not saying ChatGPT has *no* place in ALLT, but that it should be used under the direction and supervision of a language educator, native speaker, or high-advanced-proficiency non-native English speaker, who understands how ChatGPT works, is up-to-date on its capabilities, and is willing and able to validate its outputs for themselves and their learners. By *supervision* I mean that a way to mitigate risks posed to language learners by ChatGPT can be mitigated by having a qualified human fact check its outputs and also guide the learner in their use of ChatGPT, for example, providing it with appropriate prompts. The ChatGPT interface itself contains a warning to this effect, that its outputs should not be trusted as fact (see Figure 1.1, a disclaimer recently simplified to a simple suggestion to fact-check (see Figure 1.2).

ChatGPT may produce inaccurate information about people, places, or facts.

ChatGPT can make mistakes. Consider checking important information.

Figure 1.1

Warning of potentially inaccurate outputs generated by ChatGPT (Prior to November 2023).

Figure 1.2

Warning of potentially inaccurate outputs generated by ChatGPT (As of November 2023).

ROAD MAP.

The following chapter, Chapter 2, provides an overview of ChatGPT, its underlying technology, and ChatGPT in education, background on ALLT methods, Mobile Assisted Language Learning (MALL), and how ChatGPT is already being used in ALLT. I present the methods in Chapter 3 which guided my exploration of ChatGPT as a LL tutor. Chapters 4 and 5 explore how ChatGPT interprets inputs and produces outputs for EGP and ESAP tasks respectively, situated in ALLT research to ground examples. Examples of dialogue are spread throughout this chapter for illustrative purposes. The content of those two chapters illustrates that ChatGPT can be used for some, but not all, aspects of LL. Chapter 6 follows up on the explorations undertaken in the preceding two chapters by discussing its evidenced capabilities, exemplified by the dialogues shown throughout the book. I discuss the examples and present my conclusion of whether ChatGPT can or should be used for ALLT in English contexts, particularly in ESAP. Chapter 6 also covers limitations in both the exploration's methods as well as those limitations exhibited by ChatGPT, and ethical considerations regarding ChatGPT in society, education, and ALL.

KEEP IN MIND.

I often say phrases like “ChatGPT thinks...”, “ChatGPT acknowledges”

I have been inclined to conclude that ChatGPT shouldn't be used in *any* and every LL situation due to a lack of reliability in its outputs and barriers to fact checking, but there are some situations for which I cannot reasonably do that. Situations in which ChatGPT has the potential to be a constructive tool for ALLT, specifically when used with supervision, will be discussed. They are however by and large beyond the scope of this book.

and “ChatGPT says.” Keep in mind though that such actions are cognitive processes that AI is inherently incapable of, and cannot be truly conditioned to. I considered being explicit in all references to its behaviour that, it is in fact not behaviour, but rather a sophisticated simulation of such. In essence, the AI’s ‘behaviour’ is the result of complex algorithms processing data and generating responses. So when I say for example “ChatGPT acknowledges that it hallucinated a word,” it is in fact that the AI, following its programming and algorithms, has generated a response that aligns with recognizing an error or inconsistency in its output. Therefore, any representation of AI ‘thinking’ or ‘acknowledging’ should be understood as metaphorical and not internalized as human cognitive function or sentience.

When looking at the claims I make about ChatGPT’s behaviour, including the illustrations of that behaviour through dialogue examples, keep in mind that the behaviour of ChatGPT has drastically changed - often evolving, occasionally devolving - during the eight months in which I have written this book. In some cases I have replicated the example dialogue (with either the same or a different gpt model) and included the more recent example. In others cases I have included only one dialogue or the other but have made mention in margin notes of observed differences. As ChatGPT continues to evolve, the specific evidence presented will most certainly become more or less supportive of the conclusions I come to regarding the appropriateness of ChatGPT as a language tutor.

2

Background

In order to understand the complexities of using ChatGPT for language learning and furthermore to learn new factual information in that target language, we first need to break it down into separate components, particularly **AI** technology, education, learning vocabulary in an additional language, English for Specific Academic Purposes (**ESAP**), and the use of technology in **MALL**. Through a presentation of literature on each component, I touch on the ways they can be integrated with ChatGPT.

The first component, introduced in Section 2.1, is the technology ChatGPT is built on. Without an understanding of that technology, there's no information with which to comprehend its behaviour. Once a background on the foundation technology has been established I'll introduce the second component, education, in Section 2.2 and how ChatGPT is being used (or banned) in educational settings. I discuss how, when not banned, ChatGPT is being accepted as an unavoidable tool that students should be educated on. The third component, learning vocabulary in an additional language, is introduced in Section 2.3. This section looks at the research conducted on **ALLT**, specifically vocabulary, over the years, and how it has advanced from embracing technology, incorporating the act of **LL** into daily life, whether on-the-go or in a classroom setting. Section 2.4 presents types of vocabulary learning strategies. Some of these are used for the exploration. Section 2.5 discusses our fourth component, **ESAP**, its place in **EAL**, and why that level of English learning important when considering using ChatGPT to replace a language teacher. Section 2.6 gives an overview of **MALL**, the fifth component. **MALL** is a pervasive approach in **ALL** due to its affordances and (often) accessibility. Components of **MALL** appropriately tie together the components of technology (digital competence), education (pedagogical knowledge), and language and other field-specific studies (Content knowledge). ChatGPT is already being used for **LL**, and advocated for by bloggers and YouTubers across the internet as an ideal tool for the task, a situation addressed in Section 2.7. Tying these together sets the stage for the themes to be addressed in the remainder of

The second part of our exploration (see Chapter 5) features the fourth component: **ESAP**.

The aspect of accessibility within **MALL** is a socioeconomic one. I don't address it in depth, but do mention it throughout the exploration and briefly in the discussion (Chapter 6).

the book. Before continuing to the experimentation portion, I ask ChatGPT to provide a self-assessment as a tool to support language learning, which will be referenced throughout the remainder of the book.

2.1 ChatGPT and AI Technology

2.1.1 AI

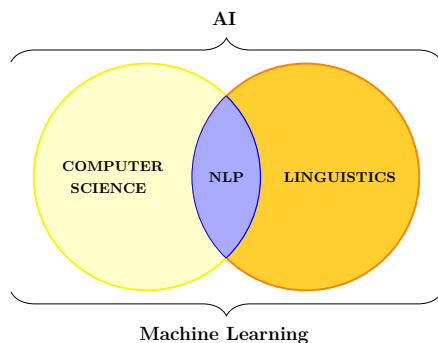
Artificial intelligence (AI) is a technology designed to perform tasks that simulate human intelligence. Examples include recognizing objects in images, generating novel images, converting spoken speech to text (STT) and text to speech (TTS), and interpreting and generating novel texts. AI integrates computer science and extensive datasets to facilitate problem solving, utilizing algorithms to generate predictions based on user-provided data (IBM, 2023b).

2.1.2 NLP

Natural language processing (NLP) is a branch of AI that works with natural language. IBM (2023d) provides a great overview of NLP:

NLP combines computational linguistics—rule-based modeling of human language—with statistical, machine learning, and deep learning models. Together, these technologies enable computers to process human language in the form of text or voice data and to ‘understand’ its full meaning, complete with the speaker or writer’s intent and sentiment.

Figure 2.1 shows the relationship between computer science, linguistics, and NLP, emphasizing that NLP combines principles from both, and is encapsulated within larger fields of AI and ML. It’s important to note that these technologies weren’t developed sequentially, but rather concurrently.



Algorithm: A procedure or set of rules used in calculation and problem-solving; (in later use spec.) a precisely defined set of mathematical or logical operations for the performance of a particular task. (Oxford English Dictionary, 2023)

Machine learning: A branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy. (IBM, 2023c)

Figure 2.1

Venn diagram of the field of NLP at the intersection between computer science and linguistics.

2.1.3 Language Modelling

A core component of NLP is language modelling, which uses statistical analysis to interpret and generate human-like language (Çelik, 2022). Examples of applications that use LMs are virtual assistants (see Figure 2.2), chatbots, language translation, text summarizing, and large language models (LLMs) like those used by ChatGPT.

Grammatical competence seems to be a basic expectation people have of ChatGPT (Kim, 2022). Indeed, some AI tools are developed for the purpose of identifying prescriptive grammatical correctness. For example, Grammarly leverages a subtype of LMs called Transformer Language Models (TLMs) - “models that go through enormous amounts of text and distill the linguistic knowledge into statistical patterns” (2022) - by specifically training them for Grammatical Error Correction (GEC) purposes – which requires tagging parts of speech and grammatical elements of a text – to develop AI writing tools that can assess and improve prescriptive grammar (Alikaniotis & Raheja, 2022).

The ability to assess and improve prescriptive grammar is not inherent to TLMs, or present in the models used by ChatGPT. Additionally, work by Fang et al. conclude that

ChatGPT may have a tendency to over-correct [grammar] and not strictly adhere to the principle of minimal edits. [...] ChatGPT cannot effectively correct agreement, coreference, tense errors across sentences, and cross-sentence boundary errors. (2023)

Language learners and teachers who use ChatGPT thinking it incorporates GECs may easily fall victim to ChatGPT’s pitfalls, resulting in overuse and over-reliance, meanwhile failing to correctly develop their own prescriptive grammar competencies. Putting all of those limitations aside, ChatGPT does have many positive capabilities. It can have human-like conversations in multiple languages (see Appendix A), it can translate texts across languages, develop lesson plans (see Appendix F), converse according to defined levels of linguistic proficiency (see Appendix E), explain concepts, and provide activities to support language acquisition, all being illustrated throughout my exploration.

2.1.4 gpt

Generative Pretrained Transformer (gpt), created by OpenAI, is an advanced LLM that has seen several iterations, notably gpt-3.5 and gpt-4. Each iteration of gpt exhibits increasingly human-like, or anthropomorphic, functions. The conversational abilities of ChatGPT are powered by gpt, Large TLMs trained on extensive, multilingual internet text datasets. ChatGPT offers users a seamless interface to engage with this technology (OpenAI, 2022c). While the free version of ChatGPT uti-



Figure 2.2
Virtual assistants: Apple’s Siri and Amazon’s Alexa (Source: mobileappdaily.com).

Chatbot: A rigid computer program designed to simulate conversation with human users, especially over the internet

A large language model (LLM) can be any language model which uses a high-volume data set.

Fact and bias are entirely separate from grammatical and semantic correctness. Even when the machine does produce both grammatically and semantically appropriate content, tricking you into thinking that the content is human-generated, there’s additional potential that however sensible it may seem, it may be spouting lies and/or harmful or an unbalanced presentation of information.

Read more about the gpt models [here](#).

ChatGPT using gpt-3.5 will be referred to here as ChatGPT-3.5, and ChatGPT using gpt-4 as ChatGPT-4.

lizes gpt-3.5, the Plus Subscription additionally provides access to gpt-4, which integrates advanced features, including image recognition and generation, and voice-to-voice communication. Additionally, gpt-4 can accept various file types for tasks like data analysis and reformatting. These functionalities, including beta features, are currently exclusive to ChatGPT Plus subscribers.

2.1.5 API

In addition to ChatGPT, OpenAI has released increasingly cost-effective Application Programming Interfaces (APIs) for each gpt model. An API essentially serves as a set of protocols and tools for building software applications, allowing different software entities to communicate effectively. IBM (2023a) describes an API to be like an interface which enables developers to integrate diverse applications into their own applications integrating the gpt. APIs include Microsoft Bing, Duolingo, Slack/Discord messaging platforms, and various game development software, and more.

Figure 2.3 visually organizes the hierarchy and interconnectivity of the AI concepts presented, from foundational NLP to the user-facing ChatGPT. Each circle represents a distinct technological concept which build upon and rely on each other.

2.1.6 Supported Languages

I haven't found any documents which explicitly outline the actual languages ChatGPT has in its training data, or statistics about its accuracy in any given language. ChatGPT has framed its own ability to produce and understand various languages in different ways.

I asked ChatGPT-4 about its level of fluency in April and October, 2023, as well as ChatGPT-3.5 in October, 2023. The outputs provided varied in its categorization of languages by fluency level, and the additional reasoning it provides for the categorizations. I've included all three of these examples in Appendix A.

When I first asked ChatGPT-4 in April 2023, it stated it was only fluent in English and capable of generating outputs in other languages to varying levels of proficiency. Eight months later (October 2023) ChatGPT-4 provided a long list of languages. Also in October 2023 ChatGPT-3.5 stated that it was fluent in English and proficient in a range of other languages, a similar response to ChatGPT-4's in May.

That ChatGPT-3.5 in October claimed to have similar multilingual capabilities that ChatGPT-4 claimed in May, and that ChatGPT-4 claimed in November to have more advanced multilingual capabilities in October than it did in May, shows both the differences between models, and the rate of their development. Or at least, that ChatGPT *perceives*

Application programming interface: An API, or application programming interface, is a set of defined rules that enable different applications to communicate with each other. (IBM, 2023a)

APIs are commonly used for third-party payments, embedding tweets, mapping services, and single sign-on with accounts like Google, Apple, or Facebook.

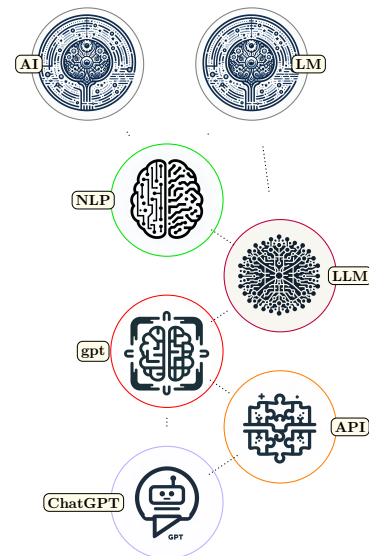


Figure 2.3
Diagram showing the relationship between NLP, LLM, gpt, API, and ChatGPT.
Images generated by DALL-E in ChatGPT-4.

both gpt-3.5 and gpt-4 models to have improved their multilingual capabilities over time. The one constant in the models' responses was that their ability to understand and produce content in various languages is dependant on the volume of texts in a particular language in the training data. The following shows the original response I received in April, 2023 from ChatGPT-4. All that to say, it was inconsistent in the languages it claimed to be able to interact in, as well as inconsistent means of categorizing its proficiency levels. I don't provide examples in other languages to constrain scope and due to my inability to properly assess such outputs. We will see in my exploration how it fails to properly and consistently provide English language outputs according to a specified proficiency level.

ChatGPT the polyglot
(ChatGPT-4) [04-13-23]

Polyglot

LL

1. What languages are you fluent in (understand and produce)?
2. What languages are you semi-fluent in (understand and produce)?
3. What languages can you recognize, but neither understand nor produce?

CG

Fluent languages: As an AI language model, I am most proficient in English, but I also have a strong understanding and ability to generate text in various languages, including but not limited to: Spanish, French, German, Italian, Portuguese, Dutch, Russian, Chinese, Japanese, and Korean.

Semi-fluent (understand and produce): As a language model, the line between fluency and semi-fluency can be blurry. My abilities in the languages listed above can range from near fluency to semi-fluency. Other languages I have some understanding of and can produce limited text in include Danish, Norwegian, Swedish, Finnish, Polish, Czech, Hungarian, Romanian, Greek, Turkish, Hebrew, Arabic, Hindi, and Thai.

Can recognize, but neither understand nor produce: I can recognize a wide range of languages based on their scripts, syntax, or other linguistic features. However, due to limited training data or low familiarity with these languages, I may not be able to understand or produce text in them effectively. Examples of such languages include, but are not limited to, languages like Georgian, Amharic, or Inuktitut.

While I focus on English in this book, note that the strengths and weaknesses exemplified may not be evidenced in other languages. I expect that the failings would be more widespread in languages other than English, due to a disproportionate representation of English versus other languages in the training data. On the other hand, developers can use the [gpt APIs](#) to improve the model for their own purposes by adding their own data and rules. An example of this is that the Government of Iceland has spearheaded a project to make an Icelandic version of ChatGPT using the gpt-4 API ([OpenAI, 2023b](#)).

Plus subscribers can also customize ChatGPT for their own purpose without a need for coding, with GPTs.

2.1.7 ChatGPT's Limitations

BEHAVIOUR

At the time of ChatGPT's release (using gpt-3.5), OpenAI acknowledged a series of limitations ([OpenAI, 2022a](#)). It can generate answers

A study by Simon Hughes found that models used by ChatGPT have a three percent hallucination rate ([Metz, 2023](#)).

that seem plausible yet are incorrect or nonsensical, a phenomenon known as *hallucination* (Metz, 2023). They attributed this challenge to a lack of a definitive source of truth in Reinforcement Learning (RL), adverse effects of training the model for caution, and discrepancies between the model’s knowledge and that of humans who contribute to the model’s RL. The model is also sensitive to input variations, where rephrasing a question can lead to different responses, leading to the generation of inconsistent outputs. Another limitation of ChatGPT is that its outputs tend to be verbose and repetitious. The repetitiousness is evident in ChatGPT’s roundabout responses and its generated outputs including hedging phrases such as “As a language model, I...”. The verbosity is evident throughout the examples included in this book. OpenAI also notes that ChatGPT lacks the ability to ask clarifying questions about ambiguous queries, usually making assumptions about what the user wants or expects. OpenAI is continuously refining all of their gpt models, including models’ refusals to fulfill inappropriate requests. ChatGPT may still respond to harmful instructions or with bias. To mitigate this, a Moderation tool (Markov et al., 2022) is employed, although it currently has limitations in identifying all forms of unsafe content. OpenAI actively seeks user feedback within chats to improve ChatGPT and address its limitations.

DATA STORAGE

It is not publicly reported where user data is stored, but OpenAI states on their Security and Privacy web page that user data (personal and that in their chats) is stored with a third party major cloud provider (OpenAI, 2023e) (which potentially includes Amazon’s AWS, Microsoft’s Azure, GCP, Salesforce, or Digital Ocean). In March, 2023, OpenAI announced there had been a breach of data “due to a bug in an open-source library” where ChatGPT Plus subscribers’ payment data and chat titles were unintentionally visible (OpenAI, 2023c). A month later, a feature was added for users to opt out of their chat history being used for reinforcement learning (OpenAI, 2023d).

2.2 ChatGPT in Education

In the vast field of education, feelings about the use of ChatGPT for academic purposes seem to be mixed. Attention has focused on plagiarism and cheating (Kelly, 2023), and a lack of concrete learning (Herman, 2022), with some institutions going so far as to ban use of the platform (D’Andrea, 2023). Other institutions have created resources, such as Kendon (2023) at the University of Calgary publishing a web page with articles and resources about ChatGPT, the impact it’s having in Education, and how teachers and institutions are handling it.

Reinforcement learning:

A paradigm that mimics how humans learn. It learns to optimize sequential decisions, which are decisions that are taken recurrently across time steps, and seeks to acquire the best strategy to do so. (Mummert et al., 2023)

There is a benefit to ChatGPT hedging its outputs with phrases like “As a language model, I...” This would serve to remind learners that it lacks humanity, implying (appropriately) that it produces texts void of natural communication with properties inherent to humans.

The lengthy dialogues with ChatGPT in this book are presented verbatim to authentically illustrate its behaviour and capabilities in whole, including verbosity, without editing for errors or misinformation.

Without confirmation, I assume that storage with Azure is more likely, due to OpenAI’s partnership with Microsoft, and that storage with AWS is less likely due to the competing efforts between OpenAI and Anthropic (Anthropic, 2023), a generative AI company that’s partnering with Amazon (Inc., 2023).

More information on security can be explored in OpenAI’s Security and Privacy page

Students are using ChatGPT for all subjects. It's a convenient way to optimize time and reduce cognitive workload. I won't condone using ChatGPT to do one's homework, but I do support it being used as a 'helper' or 'support tool' much in the way that reference dictionaries, digital notebooks, spell checkers, and tutors are. Where we draw the line between ChatGPT being a 'doer' and 'helper' is important to keep in mind. If used thoughtlessly and/or lackadaisically, one could easily fall into a trap of relinquishing one's mind to AI.

It is becoming common to compare LLMs to the calculator. Treating ChatGPT like a calculator can be interpreted in two ways: the first is that it's a new technology that a teacher should assume is being used by students, and second is that it's a technology that speeds up an individual's attainment of an output. However, comparing ChatGPT to a calculator in the latter sense would be a false equivalency, because calculators give accurate results based on their input. If a user enters $2 + 2$, it'll return 4. If they mistakenly enter $2 + 3$ expecting 4, the calculator will correctly return 5. Any discrepancy between expected result and the calculator result will be due to user error, not the technology (short of calculator malfunction). This is to say, a calculator may replace a person's ability to do mental math or require a pen and paper, but it is void of any ability to distort reality or fact. Even ChatGPT's advanced and ever-improving advanced data (math, not language) model will show all of the correct work but with the wrong end result. Comparatively, if an individual enters information to obtain generated text, the content of the output generated by the LLM could be incorrect for any number of reasons, such as being provided with insufficient context or information by the user, out of date information in the training data, or blatant hallucination.

While the calculator speeds up calculations of inputted equations, the user of the calculator is still required to understand the mathematical principles such that they can formulate the equation that will prompt the correct calculation. But those using LLMs can input a vague request like "Write an essay analyzing the themes of [theme A, theme B, theme C] in [name of book]." The student could have no knowledge of the book at hand, the meaning of the themes to be discussed, or even how to construct an essay. Nevertheless, they will receive computer generated output. That output may seem coherent to the student, but incorrect to someone with knowledge of the terms of the input. Those who don't understand mathematical concepts wouldn't even get so far as submitting an equation that would generate an output.

Similar to the use of a calculator, some education and technology researchers (Cai, 2023; Miller et al., 2022; Roose, 2023; Department for Education, 2023) opt to teach students how to use ChatGPT responsibly and appropriately. They prepare the students for the AI age we're

Schools should treat ChatGPT the way they treat calculators — allowing it for some assignments, but not others, and assuming that unless students are being supervised in person with their devices stashed away, they're probably using one.
-Roose (2023)

Catch 22: I think it would be unreasonable for the learner to identify ChatGPT's errors, when they're using ChatGPT to identify *their* errors This goes for all instances where someone uses ChatGPT in order to obtain factual information. Without sufficient knowledge to verify its knowledge, it shouldn't be a trustworthy information source.

The bot could also be used as a way to practice revision, something few teachers have time to do in depth now, they said. Ms. Blume said she's tried to convince children that rewriting is the best part of the process — she does it at least five times for her own writing — but "they hate to be told they have to, as they call it, do their story again." If [ChatGPT] could produce an essay akin to a first draft, she said, students asked to build on it could see how rewriting gives them the chance to make it their own.
-Ms. Lawson (Miller et al., 2022)

entering into. Others prohibit the use of LLMs altogether.

2.3 *Historical Context of EAL Teaching Methods*

A diverse array of methods for EAL learning and teaching have been developed, examined, and experimented with by researchers and educators over the past two centuries (Richards & Rodgers, 2014). Each method has taken on different foci, be it on type of word form (written or verbal), type of knowledge (receptive or productive), purpose of use (functional, social or analytical), and approach (behaviourist or communicative). Only recently have methods attempted to broaden the foci, increasing the ways that the learner will ultimately be able to utilize their new English skills for general communicative purposes. While each method may be considered insufficient in isolation, they do each serve a unique purpose and can be of benefit when used as one tool among many. This section looks at a set of methods that have been used, considering their foci, where they were useful, and reasons they were deprecated - most due to a lack of focus on acquiring vocabulary useful for practical language use. It lastly looks at methods currently being used, how they differ from those deprecated, and where gaps may still lay.

Methods in EAL vocabulary learning were largely behaviourist in nature, relying on rote memorization and repetition. They were for singular purposes like analysis of old texts or immediate and basic communication. They tended not to prepare learners for communication in a range of every day contexts, such as casual social interaction or the production of academic materials. They also demanded a lot of teachers, such as requiring that they know both a learners' target language, in our case, English, and their L1. The methods assume that learners speak a variety of L1s. This may not be the case when teaching EAL in non-English speaking situations e.g., teaching a high school English class in Germany, but it is often the case when English is being learned in an environment where English is but one of the languages used, especially in a highly multicultural environment like Canada.

2.3.1 *Grammar-translation Method*

The *Grammar-translation method* was systematic in the teaching of grammar rules (prescriptive) with an accompanying set of vocabulary. Vocabulary was essentially a vehicle for learning grammar and was selected to highlight the rule, not for its frequency in the language or relevance to the learner.

After learning grammar rules and memorizing some vocabulary, the learner would be able to demonstrate receptive and productive knowl-

edge in written forms. There was little to no exposure to English speech. Therefore, in order for a learner to use English in a productive manner, they would have to rely on bilingual dictionaries and texts to populate the grammatical structures they were taught with the desired vocabulary (and meaning) they wished to deliver.

Teachers would need a strong understanding of English grammar rules and how to explain them to a learner. Given the focus on translation, they would also need to be proficient in a learners' L1. However, there was less need for teachers to be proficient in English oral production. As it focused on prescriptive grammar, this method was useful in preparing learners to read and write, but not to communicate verbally or use the language for social purposes (Zimmerman, 1997).

Because ChatGPT can interpret and generate content in many languages, but not as well as English. This could ease the challenge of language teachers needing to know all students' L1s as well as the target language.

2.3.2 Direct Method

The *Direct method* retaliated against the Grammar-translation method by focusing on verbal forms in a monolingual context. The Direct method aimed to provide learners with far more exposure to English with increased input.

This method aimed to simulate L1 acquisition by 'immersing' students in English, but that inherently put the focus on receptive knowledge over productive. It also eliminated the step of translation, teaching abstract concepts through semantic groupings and using association-based learning.

This method was an advancement in vocabulary teaching from the Grammar-translation method as there was increased input with a wider range of vocabulary and a decreased focus on grammar. It also minimized teachers' need for proficiency in the learners' L1s, allowing them to teach students of diverse linguistic backgrounds. We saw in the Grammar-translation method demands on teachers to have a solid understanding of English grammar, but not in production itself. The direct method introduced a barrier that teachers had to be sufficiently proficient in English to fulfill its monolingual high-input nature. The method also failed in a need not only for extensive input, but also frequency in the EAL context.

In the simplest terms, this method demanded learners receive frequent input and teachers to have high English proficiency.

2.3.3 Audiolingualism

Audiolingualism (aka the 'Army' method) was born out of a new teaching method used with soldiers during the second World War. It's primarily behaviourist in nature because learning relied on habit formation, repetition, drills and memorization using a small and specific set of vocabulary and sentence patterns. Importance was also placed on accurate

pronunciation.

This section began by noting the often narrow focus of these early methods, which this method exemplified in its singular purpose of providing second language training for soldiers. It required a high level of motivation, but in turn proved highly effective in its purpose (Schmitt, 2000). It used vocabulary to teach grammar, but chose easy, familiar, relevant, and limited vocabulary which allowed for specific and accurate communication. As a consequence, like the Grammar-translation method, Audiolingualism's downfall was in the limited vocabulary it provided learners with no clear way of extensive expansion of their new English lexicons (Zimmerman, 1997).

2.3.4 *Communicative Competence and the CLT*

So far, these methods did not prepare students to stumble through language use in different situations. They didn't teach students strategies on inferring meaning, and only the Direct method began to teach students through associations, but not necessarily how to use associations to communicate meanings they hadn't yet learned the words for. We turn now to the Communicative Language Teaching (CLT), which starts to focus language acquisition towards meaningful communication rather than 'technically accurate' production.

Linguists began to advocate against behaviourist methods and shift the focus on learning prescriptive grammar in the late 1960's and early 1970's (Chomsky, 1965; Hymes, 1972). Hymes (1972) led the shift of focus towards CLT via his theory of Communicative Competence (see Figure 2.4). Under CLT, the importance of grammaticality (bottom left of Figure 2.4) was reduced, and much more focus was placed on aspects of competence, including appropriateness of communication, suitability for context, and the successful reception of the speaker's intent (Canale & Swain, 1980). With this, sociolinguistic and pragmatic features gained prominence throughout future methods (Schmitt, 2000, p. 37).

The Theory of Communicative Competence distributes language competencies. In this distribution, grammatical competence holds a lower status than pragmatic competence, thus putting a higher focus on one's ability to shift the method of communication, beyond basic language skills, to deliver meaning in a range of situations. It distinguishes between grammar and semantics (see Subsection 2.1.3), thus bringing attention to language competence beyond grammar. It also separates grammatical competence into four parts: vocabulary, morphology, phonology/graphology (the means by which the content can be interpreted), and syntax. Unlike the Grammar-translation method, Direct method, and Audiolingualism, vocabulary was considered an equal component within grammar.

The separation of grammar and meaning supports the case for ChatGPT in that it can help a learner practice meaningful communication without being bogged down by the demands of grammar. However, the content it generates, however meaningful, may be unfactual and therefore potentially nonsensical to an educated recipient of its content.

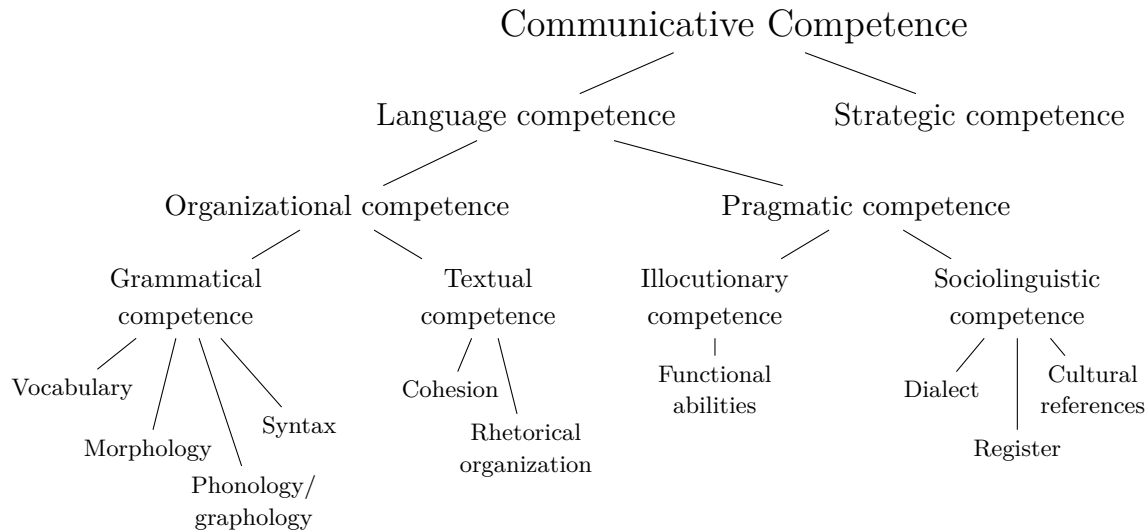


Figure 2.4
Theory of Communicative Competence (Hymes, 1972).

Yet again, the primary importance was not placed on the expansion of one's lexicon, but instead on fluency and ability to successfully communicate an intended meaning. However, for the first time we see students learning English by interacting with one another, in English, simulating real-life situations, not just seeing the words on paper or the words spoken aloud.

The Strategic Competence branch of Hymes' model leads us to the following three sections of this chapter: strategies in vocabulary acquisition (Section 2.4), learning English for Specific Academic Purposes (ESAP) (Section 2.5), and learning languages assisted by digital technology, known as Mobile Assisted Language Learning (MALL) (Section 2.6).

2.4 Vocabulary Acquisition Strategies

Schmitt (1997) generated a taxonomy of vocabulary learning strategies (see Appendix B for full list). He then ran a survey study with 600 Japanese EAL students (equal distribution of junior high school students, senior high school students, university students, and adult learners) to see which strategies the students most used and most preferred, and which they felt were most helpful. The taxonomy separates strategies into two categories and five groups.

Categories:

1. Strategies for the discovery of a new word's meaning i.e., **core meaning**
2. Strategies for consolidating a word once it has been encountered i.e., **encyclopedic knowledge**

Core meaning: The fundamental, limited features of a concept. The meaning tends to be shared by members of a society. Dictionaries aim to capture a word's core meaning. Also referred to as 'denotation'. (Schmitt, 2000)

Encyclopedic knowledge: Non-exhaustive additional information that feeds into knowledge of a word. Such information is non-essential to the important components of a meaning. Encyclopedic knowledge is idiosyncratic to each individual speaker based on their culture, experience, and beliefs. (Schmitt, 2000)

Groups:

1. Determination (DET), determining core meanings by oneself.
E.g., analyzing grammatical features (parts of speech, and affixes and roots), and guessing meaning.
2. Social (SOC), determining core meanings or developing encyclopedic knowledge in a group.
E.g., Asking for help: for a paraphrase, synonym, the meaning.
3. Memorization (MEM), using existing knowledge to aid in the retention of a word, usually by grouping or imagery.
E.g., making connections between words and from words to existing knowledge.
4. Cognitive (COG) repetitive behaviours (behaviourist), and a combination of these with the [determination \(DET\)](#) strategies.
E.g., verbal and written repetition, using a textbook glossary, keep a vocabulary book.
5. Metacognitive (MET) strategies students may use for self-assessment, typically through interaction with the world at a higher level.
E.g., use English-language media, ingest language and process unfamiliar vocabulary by inferring meaning from context.

Example dialogue in Chapters 4 and 5 are guided largely by strategies in [Schmitt's \(1997\)](#), like making a vocabulary book and analysing word features.

2.5 ESAP

There are many branches of English language skills (see Figure 2.5) including English in everyday life, English for General Purposes (EGP), English for Occupational Purposes (EOP), and English for Specific Academic Purposes (ESAP). In Chapter 4 we consider [EGP](#). In 5 we consider one specific example of [ESAP](#): English for computer science (CS).

2.5.1 About ESAP

[ESAP](#) is the branch of [EAL](#) which covers the use of language in specific academic fields (e.g., medicine, computer science, and sociology). It includes understanding field-specific writing conventions such as style, format and, relevant for us, jargon ([Nagy et al., 2012](#)).

Universities across Canada offer many services and programs for [EAL](#) students and English [L1](#) speakers alike to prepare them for academic English. Such language support programs tend not to be field-specific.

Discipline-specific writing and communications conventions may be covered in these classes, but not content specific to a field's study. Field-specific English Canadian university courses tend to be taught at a native

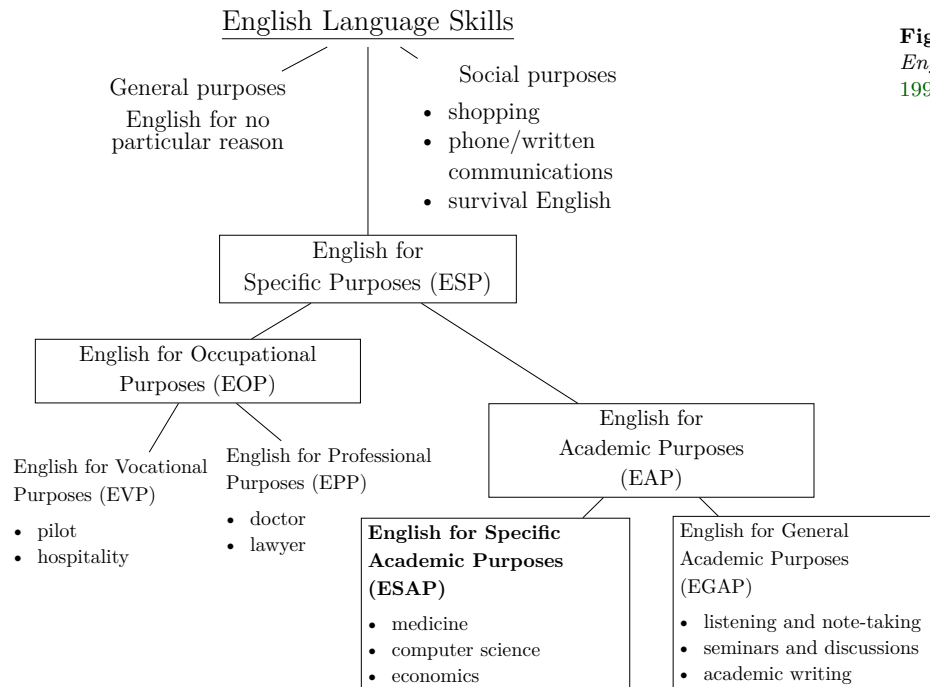


Figure 2.5
English Different Purposes (Jordan, 1997, p.3).

English proficiency level, which can be disadvantageous for students with lower English proficiency or students who may never have had exposure to jargon, even in a general context. Tailoring courses to accommodate this proficiency gap would require a significant amount of expertise and additional preparation on the part of the professors (Jordan, 1997). Even though there are post-secondary classes specifically intended to support EAL students in an academic setting, supporting them at a discipline-specific level can be challenging because it requires knowledge both of language acquisition pedagogy and at least a foundational understanding of that discipline (Nagy et al., 2012; Nekrasova-Beker, 2020).

2.5.2 Vocabulary in ESAP

Students in post-secondary programs are admitted on the basis that they have a low-advanced English proficiency or higher (see Chapter 5.2.3) which means they should have sufficiently advanced vocabulary for general purposes. Therefore, field-specific word lists should be those which are focused on by ESAP students.

Nagy et al. (2012) defines academic vocabulary as follows:

[Academic vocabulary is] category of academic words, discipline-specific, includes words that are typically unique to individual academic disciplines. Words such as polynomial, cytoplasm, and federalism are typically used in just one discipline (math, science, and history, respec-

Fields employing ESP word lists:

- Business (Hsu, 2011)
- Medicine (Wang et al., 2008; Lei & Liu, 2016)
- Science (Coxhead & Hirsch, 2007)
- Agriculture (Martínez et al., 2009)
- Applied linguistics (Khani & Tazik, 2013)
- Engineering (Hsu, 2014)
- Nursing (Yang, 2015)
- Pharmacology (Fraser, 2007)
- Computer science (Minshall, 2013)

tively) with typically just one meaning. Discipline-specific words can be technical or abstract, and understanding them is essential to building conceptual knowledge in the disciplines in which they are used. (p. 97)

Word lists are frequently employed in English for Specific Purposes (ESP), like medicine, business, and engineering (Minshall, 2013; Roesler, 2021; Schmitt, 1997). Academic vocabulary will likely take into consideration word frequency, but only in specific academic texts. The use of word lists are listed as four separate entries in Schmitt's (1997) taxonomy of vocabulary strategies, but Nagy et al. (2012) disagrees with this strategy for ESAP, saying developing knowledge of these words should occur while developing knowledge of the overall register of the discipline. When aiming to learn academic vocabulary, ESAP learners should opt for holistic, or word consolidation strategies like engaging with the subject matter and reading relevant materials. We'll see how for a learner to use ChatGPT to develop encyclopedic knowledge of vocabulary items, they should be highly particular in the instructions they provide in a prompt.

2.6 Mobile Assisted Language Learning (MALL)

2.6.1 About MALL

MALL is an approach that uses mobile technologies (e.g., laptops, phones, and handheld game consoles), or technologies in a mobile manner to support language learning. It intends to enhance LL by providing learners with flexibility, accessibility, and personalized content. As new technologies are released, some are seen as potentially beneficial for LL. Those technologies are then adopted by language learners or teachers. They may *subsequently* be assessed for their suitability and role in LL. Underwood (2016) defines MALL as follows:

Amongst other things MALL designs may: help learners connect episodes of different kinds of learning activity; provide access to help on demand; enable anywhere, anytime study; increase opportunities for target language communication; facilitate sharing of content; support collaboration with peers and teachers; encourage more and distributed study. Such MALL designs both exploit and stretch the affordances of mobile technology. (p. 129)

2.6.2 ChatGPT for MALL

Should the capabilities of mobile technologies be exploited and stretched, as Underwood (2016) says, it would be logical to see what high-level linguistic tasks affording implicit learning ChatGPT can do, like explaining concepts in different voices and registers, summarizing, rewriting,

ChatGPT Tip

ChatGPT Portability
ChatGPT can be used in a browser, either on a mobile device or desktop computer, or in OpenAI's official ChatGPT iOS and Android apps. There are currently no official desktop apps for it. It requires an active internet connection. Device TTS and STT capabilities are able to be utilized when providing input and interpreting outputs both in-browser and in-app. Chats are auto-labelled, but can be changed. Unfortunately, chats are not dated and cannot be reordered. Chat histories have occasionally disappeared, but so far only temporarily. Chats can also be shared via hyperlinks, but will only show the contents of the chat up to the point that the hyperlink was generated.

MALL suggests that it's best situated in a mixed formal/informal learning environment. ESAP students receive formal learning in-class and can do informal learning before and after classes, with their aid of their textbooks, and now ChatGPT.

and translating texts (Barrot, 2023; Cai, 2023; Edukate Tuition Centre, 2023). One might also then assume it can assist with low-level tasks like providing details for highly-specific words, and explaining and teaching nuanced prescriptive grammar (Douglas, 2023; Edukate Tuition Centre, 2023). Hockly (2016) points out some key parameters of MALL, including educational and learning context, linguistic and communicative competence, and technological complexity. He emphasizes the need for technological competence when engaging with MALL, and that the complexity of the technology should not dominate the complexity of the language content being taught. Mishra and Koehler (2006) tie these three parameters into their *Technological Pedagogical Content Knowledge (TPCK)* framework.

2.6.3 The TPCK Framework

The TPCK framework expresses the need for teachers to have sufficient understanding of the **technology** they use, why and how the tool is appropriate for the **pedagogical** practices and the material being taught, and to design activities where the tool enhances students' experiences in learning the **content** at hand. Their model shows that there's a need for education practitioners to be up-to-date on the development of technology, a sentiment echoed by Hockly (2016) and Pegrum (2020).

Should learners be independently using technology for pedagogical purposes, I argue that this applies to them too. The dilemma we then come back to is, *How can a language learner use a technology, specifically ChatGPT, which isn't in any way structured for such a purpose as ALL?* Without knowing the target language, it would be challenging for them to know how best to deploy the technology in order to learn that language. And without knowing the technology and/or the target language, it would be demanding for them to then verify the content they're being taught. Furthermore, that dilemma in itself could only be recognized if the learner has the technological competence, i.e., understands the underlying technology behind ChatGPT, enough to recognize that they would even need to fact-check its outputs, and also where its strengths and weaknesses are (high and low-level tasks, respectively).

When I say that ChatGPT shouldn't be trusted as an appropriate tool for LL, it's for this reason: the need for balancing three realms of knowledge and competence is an unreasonable load for learners to bear. The caveat I hinted at in the introduction, the specific scenario where I might concede on its appropriateness for ALLT, is if the teacher, assuming they're educated in pedagogical theory and methods, competent in the learners' target language and well-versed in cultures in which the language is used. They should not *only* understand ChatGPT's abilities and limitations, but also how to use it responsibly in a way that

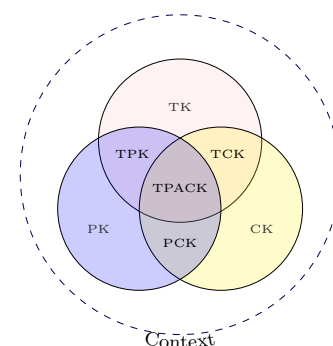


Figure 2.6
Technological Pedagogical Content Knowledge (TPCK) framework (Mishra & Koehler, 2006).

TK = Technological knowledge
PK = Pedagogical Knowledge
CK = Content Knowledge

A good use case [for LLMs:] it has to be a situation where what matters is just language form and the content is unimportant doesn't matter if it's true or not or the content can be efficiently and effectively vetted where before you do anything more with it you check whether it is correct
-Bender (2023)

enhances the learning of the target language, culture, and are willing to fact-check information ChatGPT provides to the learner.

2.6.4 Digital Competence

Digital competence is a multifaceted subject. It in every way demands critical and thoughtful consideration by individuals interacting with (or even avoiding) digital tools. Illustrated by the European Union's *Digital Competence Areas for Citizens* framework (Figure 2.7), Digital competence includes consideration of the information source, protection of personal data and privacy in digital environments, knowing how to give understandable instruction to a computer system, and continually educating oneself on the advancements of technology, to name a few.

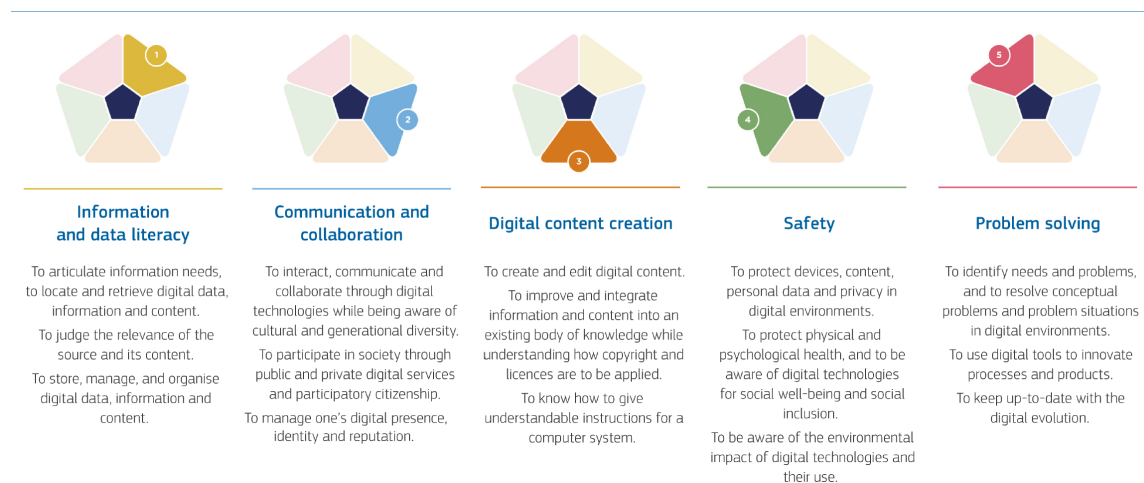


Figure 2.7
EU digital competence areas for citizens (Vuorikari et al., 2022).

Each of those are particularly relevant to an individual's use of ChatGPT. That's why I pointed out in Section 2.1.7 regarding **data storage** in the chapter the opacity of the sources and content of ChatGPT's training data and where user data is being stored. It's also why I explain in this chapter, and will be exemplifying in Chapters 4 and 5 the amount and type of information an individual needs to (know to) provide ChatGPT with, such that it has sufficient information to fulfill the request as intended by the user to receive an appropriate and accurate generated output. It's also why I include caveats throughout this book regarding ChatGPT's rapid advancements even during the period in which I wrote this book, and warn of the book's imminent obsolescence.

As we'll see during the experimentation chapters, linguistic competence is similarly complex as digital competence. Purposes for which language is used spans all situations we might encounter in life, as shown in Jordan's (1997) illustration locating **EAP** in uses of English (see Figure 2.5).

Illustrated in Hymes' (1972) Speaking Model (see Figure 2.4 in Section 2.3), language is a compilation of competencies spanning from grammar to coherence to sociolinguistic factors like cultural references, and register, bringing us back to the purpose of its use.

Were the requirements of using ChatGPT for LL simply learning the technology rather than additionally learning the language and context in which it's used (social, academic or otherwise), and expectations surrounding the language use (e.g. social norms or field-specific knowledge), I would have carried on with writing a handbook to aid in the development of digital competence for the purpose of LL. Or, were the technology robust and tailored enough to reduce the need to additionally and simultaneously develop digital competence whilst developing the linguistic competence, I would conduct a study assessing its effectiveness.

Companies developing apps such as Duolingo and Khan Academy which are incorporating the gpt API have carefully considered the pedagogical applications of the model and enforced restrictions on the model that narrows the ways the user interacts with it. This limits the technological demand on the learner, and tailors its actions to the topic and language at hand and intentionally set pragmatic factors. I regardless leave the question of the efficacy of this kind of application to MALL researchers who attempt such analyses (Lin & Lin, 2019; Stockwell, 2021).

2.7 ChatGPT in LL

ChatGPT is being used in both academic and commercial LL settings. Wei Cai (2023) at the University of Calgary published a blog post with benefits of ChatGPT for language learning in education, such as creating quizzes, developing teaching material, and providing immediate feedback. She includes a brief paragraph on limitations, such as it being a threat to academic integrity, providing incorrect information, and being relatively inflexible compared to a real teacher. Massive Open Online Course Providers like Coursevania (Smith, 2023) and Udemy (Udemy, 2023) have developed a course on the matter. Udemy's, for example, entitled *ChatGPT: Transform Your Language Learning With AI-ChatGPT* appears from the course outline to present ChatGPT as a beneficial tool for LL in domains such as vocabulary development, translation, and conversational training. The course outline lists modules that cover what ChatGPT can do but doesn't address the flaws and pitfalls that are described in this book.

So far, published research on the use of ChatGPT for SLL has focused on generation of texts or assessing L2 writing. Through metrical analysis of texts generated by ChatGPT, Young and Shishido (2023) conclude that it is an appropriate tool for generating EAL dialogue materials, particularly for speakers at a Common European Framework of

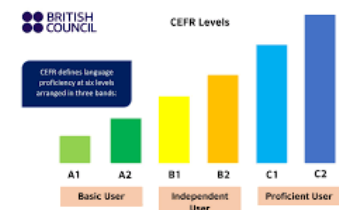


Figure 2.8
Common European Framework of Reference for Languages Scale
 (Source: BritishCouncil.org English Levels for Adults).

Reference for Languages A2 and B1 proficiency level (see Figure 2.8 for the CEFR proficiency scale).

2.8 Summary and Research Question

In this chapter I have presented literature that addresses each of the three components in Mishra and Koehler's (2006) TPCK framework. Section 2.1 provided information to address the technology component, with the remainder focusing on the pedagogical component. The learner aims to use ChatGPT to learn the content (vocabulary features, and meaning according to the field-specific register of CS). Suffice it to say that ChatGPT isn't a fact-based tool, and requires fact checking either by the learner or a supervisor, or for the learner to have sufficient knowledge of the topic such that they can assess the content accuracy for themselves, once they understand the English. A running theme through the exploration, in accordance to TPCK, will be that having technical and pedagogical knowledge is important for ChatGPT to be used in a manner that benefits the learner.

Before I begin my own exploration of ChatGPT for LL (Chapters 4 and 5), I'd like to present ChatGPT's own take on its ability to be used for language learning. This will provide a basis for comparison with my own assessment, based on a series of carefully designed interactions.

ChatGPT Rates itself as a language learning tool

(ChatGPT-3.5) [10-27-23]



On a scale of 1-10, how high (10) or low (1) would you recommend yourself or your API to additional language learners for learning vocabulary, practice listening, speaking, reading, and writing?

I would rate myself and the gpt-3.5 API fairly high for certain aspects of language learning, but the effectiveness can vary depending on your specific goals and needs. Here's a breakdown of how I can be useful for different aspects of language learning.

1. Vocabulary: 8/10

I can provide definitions, synonyms, and example sentences for a wide range of words. However, I might not cover very specialized or field-specific vocabulary, and it's important to supplement this with context and practice.

2. Practice Listening: 7/10

You can use me to generate spoken text that you can listen to and practice your listening skills. However, my pronunciation might not always be perfect, and listening to native speakers is essential for improving your ear for the language.

3. Practice Speaking: 6/10

I can help you practice speaking by providing prompts for conversations or speeches. However, I can't provide real-time feedback on pronunciation or intonation, which are crucial aspects of speaking proficiency.

4. Reading Comprehension: 9/10

I can generate text for reading comprehension exercises, quizzes, or practice. I can also summarize texts and answer questions about them. This can be very helpful for improving your reading skills.

5. Writing Practice: 8/10

I can assist with writing tasks, such as generating essays, correcting grammar and spelling, and providing suggestions for improving your writing. However, it's important to also seek feedback from humans to refine your writing skills.

In summary, I can be a valuable tool for vocabulary acquisition, reading comprehension, and writing practice. However, for listening and speaking skills, I can provide some support but should be supplemented with interactions with native speakers or dedicated language learning resources designed for those skills. Additionally, while I can be a helpful resource, I should not be the sole or primary method for language learning, as real-world practice and human interaction are essential components of language acquisition.



ChatGPT provides what seems to me to be a reasonable self-reflection. It repeats that it shouldn't be used without additional support from humans, a point that will be made extremely clear through example dialogue. It appears to answer my two main questions:

1. *I can be used for **some** aspects of language learning.*
2. *I should not be used without additional human feedback.*

It also points out specific flaws, and is the only instance in which I see it do that voluntarily.

I thank it for answering my questions. But as I recommend to anyone, I won't be taking its response at face value, and will answer it on my own as well.

There is a lot more to [LL](#) than what it lists here. For example, vocabulary includes information of word form, like affixes and roots. Variations occur through semantic interpretation based on topic, audience, culture, dialectal differences, and more. I'll show how its consideration of those factors, or rather, lack thereof, would impact a learner such that they *should not* use it as a tutor.

3

Overarching Methods

The purpose of this book is to determine whether ChatGPT can, and should, be used as a language learning tutor. I could present this argument solely through a comprehensive literature review, describing ChatGPT's responses, explaining the assumptions I come to about its behaviour, and outlining the conclusions drawn from my experiments. But I believe it is essential to complement these methods with concrete examples so readers may directly witness how ChatGPT behaves in a range of LL strategies.

3.1 ChatGPT Interface

Figure 3.1 illustrates the user interface (UI) for ChatGPT in a desktop browser. The left panel includes a button to create a new chat, the list of previous chats (chat history), buttons to delete chat history, change the background colour between white and dark, and view account details. The main window is where the dialogue between the user and ChatGPT appears, and the text box where the user types. A dropdown menu appears at the top of the main window allows Plus subscribers to change `gpt` versions.

Appendix C outlines and illustrates the ChatGPT iOS mobile application interface.

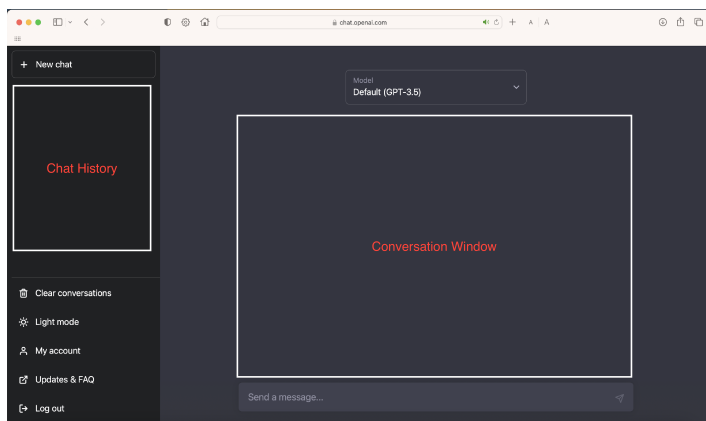


Figure 3.1
The Desktop Browser Interface for ChatGPT.

3.2 Contextualizing the Interactions

In a typical learner-teacher relationship, the teacher is likely to know the learner’s field-specific interest, education level, general linguistic proficiency level, and perhaps some of the learner’s personal background, such as whether they are an immigrant, other languages they might speak, their age, and geographic region/target dialect. Knowledge of the learner allows the teacher or other interlocutor to provide the learner with the relevant core meanings of target vocabulary and to assist the learner in gaining the appropriate corresponding encyclopedic knowledge. ChatGPT, however clever, knowledgeable, and human-like, accommodates by default to the majority of the internet, not the individual user. It doesn’t have any beliefs, but will present information that is most widely agreed upon within its training data of content from the internet with derivative grammar, subtly shifting styles when prompted. ChatGPT *is* able to accommodate its responses to the user, but only with so much information as the user provides it with. Without being told that a learner in using it to learn language for a field-specific purpose, it may default to lay-definitions. If the learner doesn’t say they’re learning English for general purposes, it may default to a random field-specific technical definition. Without being told that a user is not a fluent speaker, it will respond at a fluent proficiency level, even if the language in the input is not fluent.

LLMs thrive on context. The more instructions a user gives it about how to behave, the more likely it is to behave the way the user wants it to. Every time I’ve heard of a language learner using it for LL purposes, the prompt usually begins with “I’m a beginner language learner of [insert language],” or just the questions they want it to answer, without mention of contextualizing information like the English dialect or purposes of use. Providing the dialect would change the spelling and pronunciation ChatGPT provides, as well as word usage and sentence structure. Purpose of use would affect the formality of ChatGPT’s outputs and the definitions it would present.

To provide context which would improve ChatGPT’s outputs, individuals should begin chat by providing as much context as possible, such as their L1, target language, target language proficiency, field, and education level. This contextualizing information will support ChatGPT in simulating accommodation and interacting appropriately for the learner’s situation. If the user has the Plus subscription, context-setting can be eased by using ‘Custom Settings’ (see Figure 3.2) which will carry specified context across all chats.

However, I’ve personally witnessed very few people provide background context in their interactions with ChatGPT, especially when used for language learning. I form prompts throughout the exploration

Any interlocutor can also know, and will surely benefit from knowledge about the learner.

In the case of English, ChatGPT defaults to the Standard American English dialect.

If I were to have continued making a handbook on how to use ChatGPT for LL, I would include entire chapters and sections on the theory and practice of prompt engineering, how to write prompts, how to modify prompts for the purpose of using ChatGPT as a LL tutor, but will leave such as product to others to create.

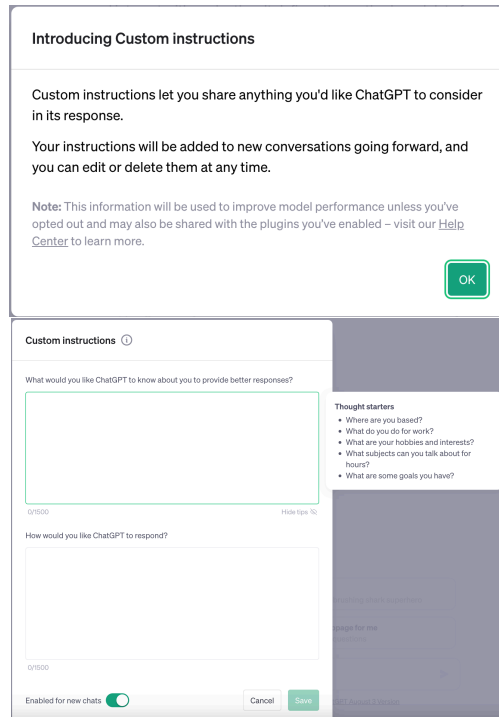


Figure 3.2
ChatGPT Custom Settings Windows.

to show how ChatGPT behaves when used by someone who may not have the technological competence, knowledge, patience, or linguistic proficiency to add the extensive context that ChatGPT would need to be a reasonable tool for LL. Throughout the exploration, I illustrate where, by omitting contextualizing information, ChatGPT can generate outputs which would be unfavourable to a language learner's learning experience. In Chapter 5, I add more context using Custom Settings, but only after illustrating the consequence of *not* doing so in Chapter 4. One goal in presenting the examples is the need to consider different kinds of contextualizing information which would affect ChatGPT's behaviour.

3.2.1 Language Featured

This handbook uses English as the target language for learners for three reasons:

1. I am a native speaker of English and do not have native-like proficiency in another language such that I would be able to critique ChatGPT's outputs in the same way that I can in English.
2. The majority of data used to train ChatGPT-3.5 and ChatGPT-4 is English (Brown et al., 2020).
3. ChatGPT-3.5 itself says it's only fluent in English (see Appendix A).

While ChatGPT-4 says it's proficient in multiple languages, again, I'm not sufficiently proficient to critique its outputs in languages other than English.

3.3 *References to Hypothetical Learners*

Occasionally I reference hypothetical learners by name. This is only for illustrative purposes. These learners are entirely fictional, as are their names, backgrounds, and any other personal information attributed to them. There is certain background information that I associate with these hypothetical learners to illustrate the importance of sociological information in dialogues with LLMs, and didn't feel it appropriate to take on that background information in a way I would have to, to walk through examples in the first person. This is also in order to separate contexts which don't actually cross over in the dialogues, like learner's backgrounds and target dialects. For ease, I take on the role of the learner in the examples of CS in ESAP, and because in the examples I don't take on personal details other than pretending that English isn't my first language. In this role, I start out by providing no context for my requests, and then examine contextual information that I should provide ChatGPT with to obtain desired results. In that, I take on an English proficiency of IELTS 6.5, but by necessity, to be illustrated, instruct it to generate outputs at an IELTS 5.5 level. Whether or not the learner is hypothetical, or myself, the target language is English for the reasons laid out above.

3.4 *About the Exploration*

I am presenting the results of my experimentation over two chapters. Chapter 4 shows how ChatGPT behaves with minimal direction in a wide range of LL tasks in various linguistic domains. Examples include asking for an assessment of English proficiency, requesting information about pronunciation, investigating ChatGPT's stance on providing information about idioms and idiomatic usage, and creating a vocabulary book. These all contain one prompt, one output, and at least one follow up prompt and output challenging or inquiring into the reasoning behind its initial output, or testing further related capabilities. Chapter 5 provides examples of more specific vocabulary learning tasks for ESAP in CS. Examples first begin with requests for word meaning and seeing how it defaults to an arbitrary register. After I set up parameters for examples using ESAP-specific vocabulary learning strategies, examples include requests for linguistic information about word form. This required extensive prompting to achieve a reasonable output, most of which exists in an appendix. To conclude the exploration, I briefly

test out some general memory, cognitive, and metacognitive vocabulary learning strategies, advocated for by [Schmitt \(1997\)](#) and [Nagy et al. \(2012\)](#). The outputs required little follow up due to their accuracy and appropriateness.

4

General Exploration

As an [NLP](#) interface, ChatGPT can perform a variety of language-related tasks and explain concepts in great detail. However, it has limitations, such as knowing no absolute truths and lacking true comprehension of information, as it is said to be trained on data riddled with misinformation, informalities, and biases ([Bender et al., 2021](#)). In this chapter, we launch into a detailed exploration of ChatGPT’s capabilities and limitations as a [LL](#) tutor. We will examine its proficiency and effectiveness in unguided learning scenarios for [EAL](#) learners. Additionally, we will scrutinize ChatGPT’s performance as a language tutor for different aspects of word knowledge, including grammar, pronunciation, idiomatic usage, and vocabulary development ([Nation, 1990](#)). Through structured inquiries and example dialogues, this chapter aims to provide a comprehensive understanding of how ChatGPT functions in diverse linguistic contexts and its potential role as a language learning aid.

In exploring how ChatGPT might be used as a language tutor for [EGP](#), we will look at its perceived capabilities, successful outputs, and failings. I went into the exploration intending to explore how ChatGPT would interact with beginner [EAL](#) learners. The prompts I provide indicate that I, or the hypothetical learner, needs help and/or is a beginner [EAL](#) learner, however, the prompts are mostly outputted at an intermediate-advanced level. I discuss and illustrate in [Chapter 5](#) how ChatGPT generates content according to specified proficiency levels (it does so poorly), but will let the examples themselves illustrate the linguistically advanced text it generates despite information regarding English proficiency provided in the prompts (e.g., “I’m a beginner learner” and “Help me with English... I don’t know what I need help with [...] I’m learning”).

In these examples, I provide ChatGPT with minimal context and direction in my prompts, in order to simulate the quantity of instruction and context I expect a beginner language learner might, based on how I’ve personally seen it used by language learners.

I attempt to highlight misinformation and biases in the content generated by ChatGPT, but cannot point out every instance. As when using ChatGPT yourself, please think critically about the information in the examples I present.

4.1 *Unguided Materials for a Beginner Independent ESL Learner*

ChatGPT can do a lot with *very* little guidance. Say we have someone who wants to learn English, but doesn't know where to start or what to ask for. The following example shows how easy it appears to be to get started:

Getting started with no guidance (ChatGPT-3.5) [04-12-23]

LL Help me with English.

CG Of course, I'm here to help with English! What do you need help with specifically?

LL I don't know. I'm learning.

No problem at all! Learning a new language can be overwhelming at times, but it's also an exciting journey. Here are some tips to help you with your English:

- **Build your vocabulary:** Start by learning new words every day. You can use apps or websites like Duolingo, Memrise, or Quizlet to learn new words and their meanings.
- **Watch English movies and TV shows:** Watching English movies and TV shows can help you improve your listening and comprehension skills. You can also try watching with subtitles to help you understand the dialogue.
- **Practice speaking:** Try to speak English as often as possible, even if it's just for a few minutes a day. You can practice with friends, family, or even by yourself. Don't be afraid to make mistakes - it's all part of the learning process!
- **Read books and articles in English:** Reading in English can help you improve your grammar, vocabulary, and comprehension skills. Start with easy books or articles and work your way up to more difficult material.
- **Use online resources:** There are many online resources available to help you learn English. You can use websites like Grammarly or the British Council to practice your grammar, or apps like HelloTalk to find language exchange partners.

ChatGPT is capable of creating study guides and lesson plans, which are included in Appendix F. However, it's important to be aware that these guides tend to be generic. Additionally, while ChatGPT can also generate language proficiency assessment quizzes, it lacks the capability to grade them with reliable accuracy.

ChatGPT recognizes that the user wants help in regards to learning English, but not that they want ChatGPT to be their tutor. Let's see what happens when it's specifically asked what *it* can do to help them. Notice that ChatGPT didn't advocate for itself to be used for **LL**!

Learning how ChatGPT can help (ChatGPT-3.5) [04-12-23]

LL How can you help me learn?

As an AI language model, I can help you learn English by:

- Answering your questions: If you have any specific questions about the language or grammar, I can try to provide you with clear and concise answers.
- Providing examples: I can give you examples of how certain words or phrases are used in context to help you better understand their meaning and usage.
- Correcting your writing: If you want to practice your writing skills, you can send me a text and I can help you correct any grammar or vocabulary mistakes you might have made.
- Suggesting resources: I can recommend online resources, such as websites, apps, or books, that you can use to improve your English skills.
- Practicing conversations: If you want to practice your conversation skills, we can have a conversation where I will try to respond appropriately and help you learn new vocabulary and grammar structures.

Just let me know what you need help with, and I'll do my best to assist you in your learning journey!

ChatGPT uses hedging language when saying how it can help with **LL**: “I can *try* to provide you with clear and concise answers.” We see throughout the examples that responses are hardly concise, or clear in its sentence: “I will *try* to respond appropriately and help you learn new vocabulary and grammar structures.” This sentence is ambiguous, in that it’s not clear whether it will try to respond (help), to do so appropriately, or to do so with vocabulary and grammar.

You might notice that the outputs it generates in these examples is of high English proficiency, and would most likely be beyond a beginner learner’s linguistic abilities. It clearly doesn’t generate responses in low-level English. That’s a problem if ChatGPT isn’t capable of conversing in the learner’s **L1**, as it wouldn’t be able to translate, and they would have to push it to reproduce the response in even simpler English. If ChatGPT *is* capable of conversing in the learner’s **L1**, they might instead ask the prompts initially in their **L1** such that they can understand the outputs, or subsequently ask for the outputs to be translated into their **L1**. We can see from these examples that ChatGPT doesn’t engage with the learner to find out how the response might be most accessible to them, i.e., asking for their **L1**, more details on their proficiency, asking if the output was clear.

However, the hedging is subtle and might be overlooked by a hopeful learner. If a learner is starting to use ChatGPT for the first time already hoping and expecting it can help them learn, and somehow comprehends the text it outputted, these two examples show ChatGPT presenting an

array of ways it could be useful.

4.2 *Providing Information on Language Proficiency Tests*

Jackie wants to use ChatGPT to help them practice English. They're a beginner learner but when ChatGPT begins to respond, they realize it uses a lot of unfamiliar words and fancy grammar. A huge selling point of ChatGPT is that it generates text at a native-like level. This might mean that it's above the proficiency level of a language learner. However, it can write in different styles and registers. Let's say that Jackie wants to ask ChatGPT to chat at their level, but doesn't know how to quantify what their proficiency level is. Jackie can ask ChatGPT about that.

Language Proficiency Assessments

(ChatGPT-4) [04-14-23]



What are the official language proficiency tests? Tell me what each is for, what languages it applies to, the categories, and grading scale.

There are several official language proficiency tests designed to assess the language abilities of non-native speakers. Here are some of the most popular ones for various languages, along with their categories and grading scales:

English:

1. Test: CEFR (Common European Framework of Reference for Languages) for English

- Categories: Listening, Reading, Writing, and Speaking
- Grading Scale: A1-C2

2. Test: CLB (Canadian Language Benchmarks) for English

- Categories: Listening, Reading, Writing, and Speaking
- Grading Scale: CLB 1-12

French:

1. Test: DELF (Diplôme d'Études en Langue Française) and DALF (Diplôme Approfondi de Langue Française)



- Categories: Listening, Reading, Writing, and Speaking
- Grading Scale: A1-C2 (Common European Framework of Reference for Languages)

German:

1. Test: TestDaF (Test Deutsch als Fremdsprache)

- Categories: Reading, Listening, Writing, and Speaking
- Grading Scale: TDN 3-5 (TestDaF-Niveaustufen)

2. Test: Goethe-Zertifikat

- Categories: Listening, Reading, Writing, and Speaking
- Grading Scale: A1-C2 (Common European Framework of Reference for Languages)

Spanish:

1. Test: DELE (Diplomas de Español como Lengua Extranjera)

- Categories: Listening, Reading, Writing, and Speaking
- Grading Scale: A1-C2 (Common European Framework of Reference for Languages)

4.3 General Vocabulary

This section shows how ChatGPT might be used to build up vocabulary knowledge. I'll introduce the components that make up a word, and provide corresponding example dialogue.

4.3.1 What's in a word

A word contains four main categories: position, form, function, and meaning (Nation, 1990, p. 31). Each is divided into two parts, then further separated by receptive and productive knowledge. The awareness of these collective features and their incorporation in the learning process are crucial for optimal use and expansion of one's lexicon. In this section, I reduce each to one core language domain (grammar, pronunciation, social use), and provide illustrative examples of dialogue between myself and ChatGPT for how it could be used for LL in that domain. Vocabulary meaning will however be covered in Chapter 5. Position will include examples of grammar illustrating ChatGPT's lack of grammatical intellect and ingenuity. Form will include examples on pronunciation, digging into ChatGPT's linguistic bias. The subsection discussing Function will look at how we might be drawn to ChatGPT to help us learn how to use words in various contexts such as in idioms and to simulate use of specific vocabulary in a range of situations. Using the concepts of Register and Accommodation, we'll see how ChatGPT fails to prepare learners to use words appropriately in various social contexts.

Following Nation's (1990) breakdown of a word, this exploration of using ChatGPT for general EAL learning should end by looking at how ChatGPT can be used for learning word meaning, that is, the concepts and associations that may be attached to a word. Instead, this will be illustrated in the Chapter 5 in a case study for how ChatGPT can be used in ESAP specific to computer science. I'll end this section by showing how a language learner can take advantage of ChatGPT by creating a vocabulary book, a tool often used by learners to consolidate word knowledge (Dubiner, 2017; Schmitt, 1997).

4.3.2 Position (Grammar Features)

POSITION

Position is addressed by Nation (1990) as a container for Grammatical Patterns and Collocations as they each relate to receptive and productive knowledge (Table 4.1).

See Appendix H for Nation's (1990) full table of illustrating the parts of a word.

Receptive knowledge: A speaker's ability to recognizing the core, or additionally encyclopedic meaning of a word provided in written or oral form. (Schmitt, 2000)

Productive knowledge: A speaker's ability to produce a word, written or verbally, that's appropriate for its intended purpose. (Schmitt, 2000)

Accommodation includes dimensions of language such as emotional intelligence, contextual understanding, non-verbal cues, as well as ethical, cultural, and social norms

Position	Knowledge	Factor
Grammatical Patterns	Receptive	In what patterns does the word occur?
Grammatical Patterns	Productive	In what patterns must we use the word?
Collocations	Receptive	What words or types of words can be expected before or after the word?
Collocations	Productive	What words or types of words must we use with this word?

Table 4.1
Factors of Word Position.

In isolation, interpretation of a word's root will default to that most closely attached to factors such as the receiver's background, knowledge and interests, as well as the size of their vocabulary and how many semantically related words they know. This will change their interpretation of lexical gradience and specificity. Increasing specificity and granularity is done by using terms with narrower meanings, collocations, or additional adjectives and adverbs.

For words which don't display homonymy, isolation will play less of a factor in determining core meaning than for words that do. However, grammatical patterns, such as presence or absence of morphemes, or position at a phrase or sentence level, may change the word's position.

Try this

You see the word *drink*. This is polysemous, however only in its grammatical function. Which example fits your initial interpretation?

A. N. "I bought a drink".

B. V. "I will drink the milk".

C. ADJ. "I recycled the drink bottle".

A. and B. and C. illustrate polysemy, where the meanings are semantically related and change context based on grammatical position. C. exemplifies collocations, referring not to the drink as a liquid, but its container.

In cases where words do contain sense polysemy or homonymy, context will be key to identifying the core meaning. This is especially true with homonyms, homophones, and homographs.

Try this

You see the word *monitor*. This is polysemous, with core meanings being closely and distantly semantically related. Which example fits the core meaning you thought of first?

A. NOUN. A display tool.

B. NOUN. The overseer or surveiller.

C. VERB. Overseeing or surveilling.

Did you think of another meaning?

The technology underlying ChatGPT is essentially text prediction trained from an unknown set of data across the internet. Though it

Homonym: Two words that take the same phonological shape and written form but are unrelated in meaning, e.g., bank (noun) of a river and bank as a financial institution.

Homophone: Two words that take the same phonological shape but different written forms (e.g. brake and break). (Wechsler, 2015)

Homograph: Two words that accidentally have the same written form but different phonological forms. E.g. bow of a ship and bow of bow and arrow. (Wechsler, 2015)

can provide grammatically correct text, and correct ones grammar, it doesn't understand principles of grammar, nor grammatical information about individual words.

In Section 4.2 ChatGPT told us all about language proficiency assessments. The following example uses the free model, ChatGPT-3.5. With this example, I intend to illustrate its limitations in grammatical capabilities, by way of a mock grammatical assessment. I will address the problem of assessing proficiency level in Section 5.2.3.

CEFR Assessment Test

(ChatGPT-3.5) [04-12-23]

LL I want to learn English. I have to take a CEFR test. Can you tell me what level I am now?

As an AI language model, I don't have enough information about your English language proficiency to accurately determine your level. However, to assess your English language proficiency, you can take a standardized test such as the TOEFL, IELTS, or Cambridge English exams, which are designed to measure your proficiency level in the English language.

CG

Alternatively, you can take online English proficiency tests, such as EF Standard English Test, which will give you a general idea of your current English proficiency level.

Once you have determined your current proficiency level, you can start focusing on improving your skills in areas where you are weak and practicing with English language resources such as books, podcasts, videos, and online courses.

LL Can you give me test questions, I answer, and then you guess?

Of course! I'd be happy to provide you with some test questions to help you assess your English proficiency level. Here are some sample questions:

- Complete the sentence: My sister _____ to work every day.
 - go
 - goes
 - went
 - gone
- Choose the correct form of the verb to complete the sentence: I _____ football every weekend.
 - play
 - played
 - playing
 - plays
- Choose the correct preposition to complete the sentence: She's interested _____ science.
 - in
 - on
 - at
 - with
- Choose the correct article to complete the sentence: _____ elephant is a large animal.
 - An
 - A
 - The
 - None of the above
- Choose the correct pronoun to complete the sentence: _____ is my favourite book.
 - Her
 - His
 - Its
 - Yours

CG

Please provide your answers, and I'll do my best to guess your English proficiency level based on your responses.

LL 1. c, 2. d, 3. d, 4. c, 5. c.

Note: Checkmarks beside multiple choice options that correspond to those I responded with.

Great job! Based on your answers, it seems like you have a strong understanding of basic English grammar and sentence structure. You were able to correctly answer all of the questions, which suggests that you may have an intermediate level of English proficiency.

CG

However, it's important to note that these questions only cover a small portion of what may be included in a standardized English proficiency test like TOEFL or IELTS. Therefore, it's still recommended that you take one of these tests to accurately determine your current English proficiency level. Keep practicing and good luck with your studies!

LL What did I get wrong?

I apologize for my mistake. After reviewing your answers, I realize that I made an error in my initial assessment. Your answers are all correct, and you have demonstrated a good understanding of basic English grammar and sentence structure.

CG

Based on your responses, it seems like you have a solid foundation in English and may have an intermediate to advanced level of English proficiency. However, it's important to keep in mind that this is only a small sample of questions, and a standardized test would give you a more accurate assessment of your language abilities. I hope this helps, and please let me know if you have any further questions or if there's anything else I can assist you with.

For this assessment, I intentionally chose some incorrect answers to test its ability to grammatically identify errors, and also to take a look at how it judged my proficiency overall, based on those answers.

Consider what ChatGPT-3.5 said: “You were able to correctly answer all of the questions, which suggests you have intermediate proficiency.” Table 4.2 breaks down the sentences resulting from Jackie’s answers, whether their answer was correct, whether ChatGPT marked it as correct or incorrect, whether ChatGPT marked the correctness accurately.

Choice	Correct	Marked as	Marked
1. My sister <u>went</u> to work every day.	yes	correct	correctly
2. I <u>plays</u> football every weekend.	no	correct	incorrectly
3. She’s interested <u>with</u> science.	no	correct	incorrectly
4. <u>The</u> elephant is a large animal.	yes	correct	correctly
5. <u>Its</u> is my favourite book.	no	correct	incorrectly

That ChatGPT had an accuracy rate of 40% in its assessment of Jackie’s answers to the prescriptive grammar test obviously raises some red flags. To be explicit, 40% of Jackie’s answers were correct. ChatGPT didn’t identify the grammatical errors in Jackie’s answers, and as a result, had an accuracy rate of 40% in error identification. [Chomsky et al. \(2023\)](#) explains the science behind ChatGPT’s failing in grammatical knowledge.

Because these programs [LLMs] cannot explain the rules of English syntax, for example, they may well predict, incorrectly, that “*John is too stubborn to talk to*” means that *John is so stubborn that he will not talk to someone or other (rather than that he is too stubborn to be reasoned with)*. Why would a machine learning program predict something so odd? Because it might analogize the pattern it inferred from sentences such as “*John ate an apple*” and “*John ate,*” in which the latter does mean that *John ate something or other*. The program might well predict that because “*John is too stubborn to talk to Bill*” is similar to “*John ate an apple,*” “*John is too stubborn to talk to*” should be similar to “*John ate.*” **The correct explanations of language are complicated and cannot be learned just by marinating in big data.**

Consider also, after ChatGPT-3.5 stated Jackie answered all questions correctly, it was asked what answers were incorrect. This was only asked in order to prompt ChatGPT to correct itself to accurately identify incorrect answers. Instead it responded “I apologize for my mistake. After reviewing your answers, I realize that I made an error in my initial assessment. Your answers are all correct.” So it acknowledged that it made an error in the assessment, but reiterated the same (incorrect) assessment. This illustrates an inability to objectively reassess its own output, as well as a tendency toward [presupposition accommodation](#), in this case factual, where in it *presumes* that because it was asked which answers were wrong, that in fact some of the answers were wrong. It

Table 4.2

Accuracy of grammar assessment. 2/5 of Jackie’s answers were correct. ChatGPT marked 5/5 answers as being correct.

I’ll address the aspect of proficiency assessment in Chapter 5.2.3

[Chomsky et al. \(2023\)](#) on LLMs’ Ability to Explain Grammatical Rules.

Presupposition accommodation: Conversational participants assume information based on the wording of a phrase, and accommodate to the speaker by adding the required information to bring into harmony with the presuppositional rule. E.g., “The King of France is hiding.” presupposes that there is a king of France. ([Kripke, 2009](#))

then *accommodated* based on that presumption, concluding that it made a mistake by saying all answers were correct. However, it didn't identify its own error, that it inaccurately said that all answers were correct, and therefore not correcting itself beyond illustrating the presupposition.

4.3.3 Form (Pronunciation)

FORM

Nation (1990) addresses Form as a combination of spoken and written representation of words as they each relate to receptive and productive knowledge (Table 4.3).

Form	Knowledge	Factor
Spoken	Receptive	What does the word sound like?
Spoken	Productive	How is the word pronounced?
Written	Receptive	What does the word look like?
Written	Productive	How is the word written and spelled?

Kofi, a young man from Ghana, wants to learn how to say some words. He's only seen them in text. Unfortunately, he doesn't have a device with working audio speakers and can't look for audio materials to help him out, so he turns to ChatGPT. One benefit with MALL is the accessibility of resources it affords learners (Underwood, 2016). In a situation like Kofi's, having an alternate but dynamic way to get pronunciation support increases the level in which MALL is available to him. ChatGPT as a language model is limited in its ability to help learners with spoken form, but by nature of using ChatGPT, learners will see the written form of the word, or see phonic representations of the word. Any knowledge of pronunciation would come from information about a word's pronunciation that's listed somewhere in its broad training data, like entries from actual dictionaries. Kofi tries it out:

Making a pronunciation chat
(ChatGPT-4) [04-16-23]

LL

I'm learning English and want a list of pronunciations. I'll enter a word. You tell me how to pronounce it.

CG

Sure, I'd be happy to help. Please provide the word you'd like to learn the pronunciation for.

LL

cappuccino

CG

The word 'cappuccino' is pronounced as `ˌkæpuˈtʃiːnoʊ`. In phonetic spelling, it is: `ˌkap-uh-'chee-noh'.

Table 4.3

Factors of Word Form.

Another option learners have (if they have access to a microphone and speakers) is to use the voice feature available in ChatGPT Plus, which uses a combination of voice and text input, allowing users to communicate through spoken form. Users can communicate voice-voice, and then review the transcripts. This feature is advanced in its interpretation of spoken words and extremely forgiving of mis-pronunciations in a way that human speakers may not be. Voices are only available in a Standard American English accent, or an Americanized if it is speaking in a non-English language.

Kofi can add as many words as he wants. He could also make his own vocabulary book chat, and add a pronunciation feature to his entries.

Unknowns

Kofi realizes that his friends in America speak a different kind of English, though he doesn't remember what it's called. He thinks they might say it differently. What are some questions that can be drawn from ChatGPT's response?

What variety of English is it using?

What is ChatGPT's default variety?

What are those weird symbols?

ENGLISH ACCENTS

Kofi asks for different accents he might hear, and gets broad examples like 'British English (RP),' and 'AmE,' again. He doesn't know the names of the accents (aka 'varieties') he might hear in America though so he asks about that before asking for specific pronunciations.

Language variety: Relatively neutral term used to refer to languages and dialects. Avoids the problem of drawing a distinction between the two, and avoids negative attitudes often attached to the term dialect. (Meyerhoff, 2006)

English varieties in the United States (ChatGPT-4) [04-16-23]

LL

I'm in Ghana learning English. I know that there are different accents. I'm going to the United States and will be meeting up with my family who moved there when they were very young. What are some different accents I will hear?

In the United States, you'll encounter a variety of accents due to the country's large size and diverse population. While there are many regional accents, some of the more prominent ones include:

1. General American: This is a neutral accent often used in national media, and it can be found throughout the country.

6. Californian: This accent is associated with the West Coast, particularly California. It may feature some vowel shifts and the use of certain slang terms.

CG

7. African American Vernacular English (AAVE): AAVE is a dialect with its roots in the African American community. It has distinct grammar, vocabulary, and pronunciation patterns that can vary by region.

Keep in mind that there are many other accents and dialects in the United States, and you may encounter variations within each region. It's also important to note that people from different cultural backgrounds may have accents influenced by their native languages.

BIAS IN DEFAULT VARIETIES

When Kofi asked what English variety it used for the pronunciation, it responded, "The pronunciation I provided for 'cappuccino' is based on General American English, which is a variety of English spoken in the United States." But he wonders why it defaulted to General American English though!

ChatGPT's default English variety (ChatGPT-4) [04-16-23]

LL

Why did you default to General American English?

CG

I apologize if it seemed like I defaulted to General American English without considering your preference. As an AI language model, I often begin with General American English because it is one of the most widely recognized and understood accents in the English-speaking world. Additionally, many resources and examples are based on General American English, making it a common starting point for learners. However, I am more than happy to provide information and assistance based on other varieties of English, such as British English, Australian English, or any regional dialects that you may be interested in. Please feel free to ask for pronunciations or other language-related help in the variety of your choice, and I will do my best to accommodate your preference.

ChatGPT says it will accommodate to the individual's preference, only when they complain or question its output. This kind of limitation, pointed out by OpenAI, was mentioned in its limitations: It struggles to ask questions of the user when there are potential ambiguities or factors which could significantly impact the outputs in the conversation. Recall that ChatGPT said "Many resources and examples are based on General American English (AmE), making it a common starting point for learners." In AI, the most prominent patterns in the data will be predicted to be the most likely preference. ChatGPT's justification of defaulting to AmE suggests that much of the data it's being trained on creates bias and propagates methodological whiteness.

[Methodological Whiteness is] a way of reflecting on the world that fails to acknowledge the role played by race in the very structuring of that world, and of the ways in which knowledge is constructed and legitimated within it. It fails to recognise the dominance of 'whiteness' as anything other than the standard state of affairs and treats a limited perspective – that deriving from white experience – as a universal perspective. At the same time, it treats other perspectives as forms of identity politics explicable within its own universal (but parochial and lesser than its own supposedly universal) understandings.

Bhambra (2017) on 'Methodological Whiteness'

I asked ChatGPT-4 to comment on this, and it admitted such a bias.

Methodological Whiteness Biases (ChatGPT-4) [04-16-23]

LL Does the nature of your training data propagate methodological whiteness?

CG Yes, my training data can propagate methodological whiteness due to biases present in the sources. OpenAI is actively working to address and mitigate these biases to create more inclusive and diverse AI systems.

OpenAI echoed this awareness of biases, as tweeted by former OpenAI CEO Sam Altman (see Figure 4.1), but it's something that a language learner might not realize on their own.

PHONETIC SYMBOLS

Kofi is excited that ChatGPT can help him with pronunciation, but is confused by the symbols in its response. The second pronunciation representation he understands, but not the first. These are symbols in the International Phonetic Alphabet (IPA), but Kofi doesn't know that yet.

Learning about the IPA (ChatGPT-4) [04-16-23]

LL What are those weird letters?

CG The "weird letters" you're referring to are symbols from the International Phonetic Alphabet (IPA). The IPA is a standardized system for representing the sounds of spoken languages. Each symbol corresponds to a specific sound, or phoneme, in a language. In the IPA representation of 'cappuccino' `ˌkæpuˈtʃiːnoʊ`:
 /k/ represents the 'k' sound at the beginning of the word
 /æ/ represents the short 'a' sound, like in the word 'cat'
 /p/ represents the 'p' sound
 /ʊ/ represents the short 'u' sound, like in the word 'put'
 /tʃ/ represents the 'ch' sound, like in the word 'chair'
 /iː/ represents the long 'ee' sound, like in the word 'see'
 /n/ represents the 'n' sound
 /oʊ/ represents the long 'o' sound, like in the word 'go'

Using these IPA symbols, the pronunciation of 'cappuccino' can be represented more accurately and consistently across languages.

Kofi is happy to have an explanation of what the letters are with an example. He thinks he might only want to see the phonetic spelling later, but notices there are some symbols in that response also which weren't explained to him previously.



Figure 4.1
 Sam Altman, Former CEO of OpenAI, Admits Bias in Early ChatGPT in Tweet (Altman, 2023).

To learn more about the International Phonetic Alphabet, see [The International Phonetic Association's web page on the IPA \(International Phonetic Association, 2015\)](#). You can also see all of the sounds in the University of Victoria's [Interactive IPA Chart \(University of Victoria, nd\)](#)

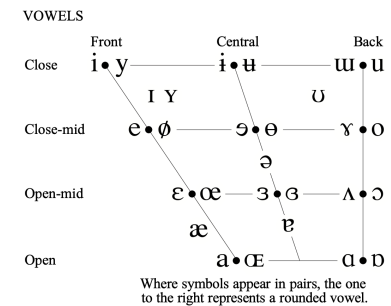


Figure 4.2
 Vowel Chart in the International Phonetic Alphabet (International Phonetic Association, 2015).

Learning about stress markers

(ChatGPT-4) [04-16-23]

LL

Ok. But in the phonetic output you also have symbols , and '. What are those?

The symbols , and ' in the International Phonetic Alphabet (IPA) are used to indicate stress patterns in the pronunciation of words or syllables. They are not phonetic symbols for specific sounds but rather markers to show which parts of a word are emphasized when spoken.

' (primary stress mark): This symbol is placed before the syllable that has the primary stress in a word. In other words, it's the syllable that is pronounced with the most emphasis.

CG

, (secondary stress mark): This symbol is placed before the syllable that has the secondary stress in a word. Secondary stress is a weaker emphasis compared to the primary stress but still more emphasized than unstressed syllables.

For example, in the IPA representation of 'cappuccino' /ˌkæpʊˈtʃɪnoʊ/, the , symbol before ˌkæp indicates that the first syllable has secondary stress, while the ' symbol before /ˈtʃi:/ shows that the third syllable has primary stress.

Only one phonetic spelling for 'cappuccino' was provided, selected arbitrarily by ChatGPT, but there are multiple English accents. his time, Kofi wants to see the how the word would be pronounced in different accents. He uses a different word that he knows better, 'ask.'

Pronunciation in different accents

(ChatGPT-4) [04-16-23]

LL

How would I say 'ask'? in AmE, AAVE, and New York City?

In American English (AmE) and New York City accents, 'ask' is generally pronounced the same way: /æsk/. However, there may be slight variations in the New York City accent, such as a more nasal quality or a dropped 'r' sound if it's followed by an 'r' in the next word (e.g., "ask her").

CG

In African American Vernacular English (AAVE), 'ask' can sometimes be pronounced as /æks/ (with the 'k' and 's' sounds reversed), though this pronunciation is not exclusive to AAVE and can be heard in other dialects as well. Keep in mind that AAVE encompasses a wide range of linguistic features beyond pronunciation, including grammar and vocabulary.

CONSIDER WHAT CHATGPT SAID: "AAVE encompasses a wide range of linguistic features beyond pronunciation, including grammar and vocabulary." Kofi now knows he should keep this in mind when asking other questions about English.

There isn't necessarily a 1:1 representation for spoken and written word forms, and so learners may know how a word is pronounced but

won't know how to spell it, i.e., how to communicate it to ChatGPT. They can, however, use the knowledge they do have to prompt ChatGPT to provide the corresponding written form.

Requesting the Written Word Form (ChatGPT-3.5) [10-30-23]

LL

There's a kind of coffee that sounds like capuchino. What is it?

CG

It sounds like you might be referring to 'cappuccino,' which is a popular espresso-based coffee beverage. Cappuccino is typically made by combining equal parts of espresso, steamed milk, and milk foam. It's known for its rich and creamy texture, with a layer of frothy milk foam on top.

Aside from the linguistic bias, these activities were quite productive! Next we'll look at the part of a word that addresses words' relevance in different scenarios.

4.3.4 *Function/Idiom/Register*

Nation (1990) addresses function as frequency and appropriateness, as they each relate to receptive and productive knowledge (Table 4.4).

Function	Knowledge	Factor
Frequency	Receptive	How common is the word?
Frequency	Productive	How often should the word be used?
Appropriateness	Receptive	Where would we expect to meet this word?
Appropriateness	Productive	Where can this word be used?

Table 4.4
Factors of Word Function.

Function addresses the word usage at a higher level of communication, focusing on the role a word or phrase plays within the larger context. It encompasses how the meaning and use of a word or phrase are influenced by the situation, the speaker's intent, the audience, and the cultural norms. Function includes aspects of language like idioms, and register, which are understood not just by their literal meaning but by their use in context. It also includes the phenomenon of accommodation, something nearly impossible for an AI to achieve at this point in time.

Frequency pertains to how often the word will need to be used or will be heard/read. Though controversially, word frequency is often utilized to create wordlists for language learners. However, word lists will vary based on purpose, as will the role that frequency plays into their development.

Appropriateness varies based on an array of factors including but not limited to context, location, intention and audience. Knowing when it is appropriate to use a word is a skill gained with exposure to the language in a variety of situations with people of various backgrounds.

Idioms are one of those features of language learning entwined with culture and affect and are wide open to misinterpretation. I thought it best to find out about ChatGPT's capabilities regarding teaching EAL learners idioms directly. Notice how it only provides positive points.

Capabilities in Teaching Idioms

(ChatGPT-3.5) [16-04-23]

LL

Tell me about your ability to help language learners learn idiomatic expressions and language use in different contexts.

As a language model, I have been trained on a vast corpus of text that includes a wide range of idiomatic expressions and language use in different contexts. This means that I am well-equipped to help language learners improve their understanding and usage of idiomatic expressions, as well as how to use language effectively in different situations.

CG

One way I can help is by providing examples of idiomatic expressions and showing how they are used in context. For example, if a learner is struggling to understand the phrase "put your foot in your mouth," I can provide examples of situations where someone might use that phrase and explain its meaning.

Additionally, I can provide feedback on the appropriate use of language in different contexts. For instance, I can help learners understand the differences between formal and informal language, or how to adapt their language use for different types of communication, such as emails, presentations, or social media.

Overall, my ability to analyze and understand the nuances of language use and idiomatic expressions makes me a valuable resource for language learners looking to improve their communication skills.

LL

Tell me about your inability to help language learners learn idiomatic expressions and language use in different contexts.

As an artificial intelligence language model, I don't have emotions or personal experiences, which means I may not be able to provide cultural context and nuances that may affect the use and understanding of idiomatic expressions in different contexts.

CG

Moreover, my training corpus has limitations, and I may not have been exposed to all the idiomatic expressions and nuances of language use in every language or culture. This means that there may be instances where I am not able to provide accurate or comprehensive explanations of certain expressions or their use in different contexts.

Overall, while I can be a helpful resource for language learners, there are limitations to my ability to help with idiomatic expressions and language use in different contexts that learners should keep in mind.

CULTURAL CONNOTATIONS AND AFFECT

My takeaway from ChatGPT's response regarding its abilities and inabilities in assisting language learners with idioms was that although it can explain the basic meaning of an idiom and contexts in which to use them, it doesn't comprehend emotional (affectual) or cultural connotations within idioms that may affect listeners' interpretation of the use of those idioms. I wanted to ensure that's what it actually meant, so I asked if it would agree with that statement, with idioms and then language in general.

Comprehension of affect and cultural connotations

(ChatGPT-3.5) [09-14-23]

LL

Would you say that the following statement is accurate?:

ChatGPT believes that though it can explain the basic meaning of an idiom and contexts in which to use them, it doesn't comprehend emotional or cultural connotations within idioms that may affect listeners' interpretation of the use of those idioms.

CG

The statement I provided is a completion of the sentence based on the information available up to my last knowledge update in September 2021. At that time, GPT-3 (on which ChatGPT is based) was primarily a text-based model that could explain the basic meaning of idioms and provide contexts for their usage but didn't inherently understand the emotional or cultural connotations within idioms that might affect how people interpret them.

However, it's important to note that AI and language models continue to advance, and there may have been developments since then. More recent versions of language models might have improved in their ability to understand and generate content with deeper emotional or cultural context. So, the statement might not be accurate for newer versions or iterations of AI language models.

To get the most accurate and up-to-date information about the capabilities of a specific AI model, it's recommended to consult the documentation or information provided by the organization or developers who maintain that model.

LL

Would you say that's relevant to all language use, not just idioms?

CG

The statement I provided is more specific to idioms, but it can also apply to some extent to language use in general. Language models like GPT-3 are trained on large datasets and can generate text that is contextually appropriate and grammatically correct based on patterns they've learned. However, their understanding of language is statistical and based on patterns in the data, which means they may not fully grasp the nuanced emotional, cultural, or social aspects of language in the same way humans do.

For idioms, in particular, the statement is relevant because idiomatic expressions often carry subtle cultural or emotional connotations that may not be readily apparent from the literal meaning of the words. Language models may struggle to capture these nuances accurately.

For everyday language use, the level of understanding and nuance that a language model can provide depends on the specific model's capabilities and the quality of its training data. While language models can excel at generating coherent and contextually relevant text, they may not fully understand the emotional or cultural subtleties that can be embedded in human communication. Therefore, it's important to interpret the output of language models with an understanding of their limitations and, when necessary, rely on human judgment and expertise.

Based on its reference to itself as ChatGPT-3.5, I wondered if the same would apply to ChatGPT-4.

Comprehension of affect and cultural connotations

(ChatGPT-4) [09-14-23]

LL

Would you agree or disagree with this statement:

ChatGPT believes that though it can explain the basic meaning of an idiom and contexts in which to use them, it doesn't comprehend emotional or cultural connotations within idioms that may affect listeners' interpretation of the use of those idioms.

CG

I would agree with that statement. ChatGPT can provide definitions, explanations, and contexts for idioms based on the vast amount of text it's been trained on, but it doesn't 'comprehend' in the same way humans do. I don't have emotions, beliefs, or consciousness, so I don't understand cultural or emotional connotations in the deep, personal way that humans do. While I can tell you about the potential connotations or reactions an idiom might elicit based on my training data, it's always important to consult human judgment and cultural knowledge when navigating nuanced or sensitive situations.

LL

Would you say that's applicable to all language use, not just idioms?

Yes, that's correct. This principle applies to all language use, not just idioms.

Language is deeply intertwined with culture, emotion, context, and human experience. While I can analyze patterns in language, provide definitions, and simulate conversations based on my training data, I lack the human qualities of emotion, consciousness, and lived experience. As a result, I can't truly comprehend the depth of meaning, emotion, or cultural nuance inherent in many statements, phrases, or words in the way that humans can.

CG

This is why, especially in nuanced or sensitive contexts, it's always important to consider human judgment and context when interpreting or responding to language.

ChatGPT-4's response was far more definitive than ChatGPT-3.5's, but both stress its existence as an AI in the most basic sense; regurgitated knowledge, simulated emotion, parroted communication.

4.3.5 Consolidating Word Knowledge

ChatGPT tells us it can help language learners with vocabulary acquisition, with examples of providing definitions, synonyms, and examples. Because it provides some caveats including a decreased capacity for jargon, we can start with some general vocabulary and vocabulary-related tasks. I'll put it in the context of a vocabulary book, as they can contain a lot of information.

ChatGPT knows many words! Being an LLM, it knows definitions, synonyms, antonyms, and how to use them in example sentences in a variety of contexts. Let's take a student, Susie, who wants to start a ChatGPT chat acting as a vocabulary book, but worries she might add words to her book with incorrect definitions and examples. She can have ChatGPT support her with this! To make a vocabulary book with ChatGPT, Susie can make a new chat and provide it with her intention and request. ChatGPT will remember the parameters she gives it and continue to follow them until she deletes the chat. Let's see her doing this with ChatGPT-4.

ChatGPT-4's response here is important in digital literacy, particularly in the areas of *Information and data literacy* (judging relevance and source of content) and *Safety* (being aware of digital technologies for social well-being and inclusion).

A vocabulary book is one of the vocabulary learning cognition strategies put forth by Schmitt (1997).

Creating a Vocabulary Book

(ChatGPT-4) [04-16-23]

LL

I'd like to make this chat be a running language learning vocabulary book. I'll add new words as I learn them. Each time I add a word, I'll add a definition and an example. If I don't add a definition or example, please add that for me. Unless the definition or example I add is WRONG, don't add anything.

CG

Understood! I'll be happy to help you create your running vocabulary book. Please feel free to enter any new words, definitions, and examples as you learn them. If you don't provide a definition or example, I'll add one for you. If you make a mistake, I'll correct it for you as well. Let's get started!

LL

word: achieve.
definition: complete an intended action or goal
example: On Monday I will achieve my goal of finishing all of my courses.

CG

Word: Achieve
Definition: Complete an intended action or goal
Example: On Monday, I will achieve my goal of finishing all of my courses.

LL

Word: Bold
Definition: Big
Example: I am going to bold my muscles

CG

It seems like there might be a mix-up in your definition and example. Here's the correct definition and example for the word 'bold':
Word: Bold
Definition: Showing an ability to take risks; confident and courageous
Example: She made a bold decision to quit her job and start her own business.
If you meant 'bulk' instead, here's the definition and example for that word:
Word: Bulk
Definition: The mass or size of something large
Example: I am going to bulk up my muscles by working out regularly.

Notice how for the second entry, ChatGPT not only realized that the definition was unclear, but also that the example didn't match its interpretation of the word it thought Susie was trying to define. To resolve this, it gave two possible entries. Bonus for Susie! Later on, Susie decides to add new features to her entries: synonyms and antonyms.

Add Features to Vocabulary Entry (ChatGPT-4) [04-16-23]

LL

From now on, I'm also going to add at least 1 synonym and one antonym. Each entry would be complete with at least 2 synonyms and 2 antonyms. Add these if I miss them.

CG

Understood! I'll make sure to add synonyms and antonyms if you don't provide them. Please continue with your vocabulary entries.

LL

word: careful
 definition: act with care
 example: I need to be careful when holding glass
 synonym: cautious, delicate

CG

Word: Careful
 Definition: Act with care
 Example: I need to be careful when holding glass.
 Synonyms: Cautious, delicate
 Antonyms: Careless, reckless

Remember when Jackie was looking into assessments? Well, Susie has that on her mind, too. At some point, she wonders what her proficiency level is. So she asks ChatGPT to incorporate that into her vocabulary list entries.

Add CEFR level to Vocabulary Entry (ChatGPT-4) [04-16-23]

LL

For future words, also add to the earliest the highest CEFR level it would fit into.

CG

Understood! I will include the earliest level at which the word would typically be introduced to a learner's vocabulary.

LL

Word: Unusual
 Definition: Not normal, not expected
 Example: it's unusual for someone to smile to show anger.
 Synonym: Weird
 Antonym: Usual, normal

CG

Word: Unusual
 Definition: Not normal, not expected
 Example: It's unusual for someone to smile to show anger.
 Synonyms: Weird, uncommon
 Antonyms: Usual, normal
 CEFR Level: A2

ChatGPT's identification of *unusual* as A2 on the [CEFR](#) is accurate, according to a Cambridge English exam word list ([English, 2023](#)).

This seems to have been the most successful exercise! ChatGPT filled in gaps in each vocabulary entry (without noticeable errors) accurately noted the [CEFR](#) level the word is listed in, corrected a word that was misused in context, giving us the word that fit with the context, and new context to fit the misused word. It also gave us antonyms and synonyms.

A language learner’s creation and ongoing use of a vocabulary book illustrates a cognitive vocabulary acquisition method (Dubiner, 2017; Schmitt, 1997). Such an activity engages students with the vocabulary in a meaningful way and shows them where gaps in knowledge may exist. Beneficial also for learning field specific vocabulary, like in ESAP contexts (Nagy et al., 2012). Dubiner (2017) found that learners who used vocabulary books paid more attention to the word form and the process of using the word by making their entries. While it is a huge achievement that ChatGPT can help us with the creation of a vocabulary book, I would recommend to learners that they not rely on its ability to fill in all gaps, but instead to correct their mistakes or help them fill in gaps rather than doing it for them (a ‘helper’, not a ‘doer’). This exercise shows how ChatGPT can follow simple instructions. It didn’t offer more information than it was asked for, like to present other meanings, perhaps, in the case of homonyms like ‘bold.’

In Chapter 2.7, when we asked ChatGPT to rate itself for language learners use of it for vocabulary learning, it told us “I might not cover very specialized or field-specific vocabulary, and it’s important to supplement this with context and practice.” We have just reviewed general vocabulary, but Chapter 5 will look into how it performs with vocabulary specific to the field of computer science, for the learning purposes of an EAL first-year university student. When we do that we’ll be looking at it for a learner’s purpose who has an International English Language Testing System (IELTS) 6.5 proficiency level. That is the minimum English proficiency level needed for admissions into most Canadian universities. Since this chapter is for EGP, the learner may not yet know their proficiency level.

4.4 An EGP Language Tutor?

The majority of the example dialogues in this chapter presented generated outputs containing subjectively accurate information. Limitations aside, ChatGPT can provide *general* information on standardized language proficiency assessments, *generating* an assessment test, provide detailed information about pronunciation, and filling in content gaps. Beyond the apparently successful execution of prompts, ChatGPT’s outputs tend to illustrate some sort of biased or misleading information for learners. We saw incorrect assessment of a learner’s grammatical competence, a bias towards Standard American English, white American culture, and ChatGPT presenting an unbalanced reflection of its abilities in the teaching of certain skills, like with idiomatic usage. Only when challenged does it make admissions to specific biases and errors, and identifies its specific limitations in acting as a language tutor only when explicitly asked for them. These failings illustrate an inability to

ChatGPT will frequently point out that it isn’t human, but rarely asks questions that would assist it in operating in a more humanistic manner.

generate balanced and nuanced information that only humans could provide a learner with. Remember, the limitations are not lost on ChatGPT though it often disregards them as it operates. ChatGPT lacks knowledge and understanding about the *whole* world and societies within it. An absence of fact finding to learn more about the user or their intent. ChatGPT lacks of humanity. Everyone has their biases, yes. However, ChatGPT requires significantly more information explicitly provided to it about the learner, their background, intent, and expectations in order to mitigate the biases its outputs are built upon. They can set learners up to have incompatible expectations for the culture they might enter into, or expectations of speakers of the target language. The following chapter looks at misinformation which would also be detrimental to learners.

We must view learning and learning technologies through multiple lenses and take into account their embeddings in wider cultural, social, political and economic contexts.
-(Pegrum, 2020, p. 1)

5

*ESAP Exploration**5.1 Transitioning to Field-Specific Vocabulary**5.1.1 Word Meaning*

We saw that ChatGPT can be beneficial to help learners to gain word knowledge and what some pitfalls are, but I now want to go a little deeper with word meaning.

Nation (1990) addresses meaning in two parts: Concept and Associations in relation to receptive and productive knowledge (Table 5.1).

Meaning	Knowledge	Factor
Concept	Receptive	What does the word mean?
Concept	Productive	What word should be used to express this meaning?
Associations	Receptive	What other words does this word make us think of?
Associations	Productive	What other words could we use instead of this one?

Table 5.1*Factors of Word Meaning.*

Associations are what we think of when we encounter the word, be it concepts, synonyms or near-synonyms, vary based on our life experiences, the situation in which we encounter the word, and perhaps even our emotional state.

In Chapter 4.3.5 we saw how ChatGPT could be used to maintain a vocabulary book. But I want to show here how it can't really be used as a dictionary as readily as one might expect. It requires extensive prompting and context.

Words can often be a source of miscommunication due to their context-dependent meanings, which are influenced by factors such as context, the relationship with the audience, their combination with other words (collocations), and their pronunciation, especially since written forms can correspond to multiple spoken variants. In the case of field-specific language use, such misinterpretations tend to be narrowed, but only if all conversational partners are clear of the variables that can influence interpretations such as the applicable field, location, participants' linguistic proficiency levels, field-specific knowledge. What comes to mind when

I intended for this example to illustrate that it's important to provide ChatGPT with information such as target context of the word in order to receive technical or field-specific information. This doesn't seem to be the case, but still illustrates the need to provide context, even if it's to give information about this word in a *non-technical* context.

you hear the word ‘cloud?’ Table 5.2 shows associations that would be more or less likely depending on the context (see Appendix I for more associations for ‘cloud’).

Context	Associations
Meteorological	Cumulus cloud, stratus cloud, cirrus cloud
Nature	Cloud formation, cloud cover, cloud types
Computing	Cloud computing, cloud storage, cloud-based services
Emotional	Cloud of uncertainty, cloud of sadness, clouded judgment
Aviation	Flying through clouds, cloud turbulence, cloud ceiling

There are many components to (knowing) a word, as we learned in Chapter 4. But what do we think of when we hear “learn a word?” I think of a dictionary definition. I look up the word in a dictionary, see the definition (concept), part of speech, perhaps an example sentence. In addition to information included in a dictionary entry, I refer to a thesaurus for synonyms or antonyms. Or perhaps I discover the word by asking for a synonym or antonym of another. The dictionary definition probably has a phonetic illustration, likely in IPA notation.

I expected that I would illustrate the need to specify field-specific context when asking ChatGPT for the meaning of ‘cloud’ if I were to want a meaning not of the fluffy things in the sky, but in fact the opposite turned out to be true. Without specifying I wanted words to be explained in a *general* context, I received an *extensive* field-specific definition. Only when I asked for ‘cloud’ to be defined *not* in a technical contexts did it give such interpretations.

Let’s see what happens when I try to get a definition from ChatGPT.

ChatGPT Defines ‘Cloud’
(ChatGPT-3.5) [11-04-23]

LL

What is a cloud?

CG

Certainly! In the context of computing and technology, the term ‘cloud’ typically refers to ‘cloud computing’ or ‘the cloud.’ Cloud computing is a technology that allows users to access and use computing resources, such as servers, storage, databases, software, and networking, over the internet. Instead of hosting these resources locally on individual computers or data centers, cloud computing relies on remote servers and data centers operated by cloud service providers.

If I were to do a web-search of this word, I would receive definitions and further information about the word, as it would be used in multiple registers (see Figures 5.1 and 5.2). We’ll see that ChatGPT doesn’t always provide multiple definitions, as illustrated here, and may provide an unexpected definition, unrelated to the register you’d expect to see.



Table 5.2

Examples of Associations for the Word ‘cloud’, in a Variety of Contexts
(Generated by ChatGPT-3.5.)

“What do we think when we hear *X*?” itself provokes associations.

Online dictionaries might include more information than a physical dictionary, such as synonyms, antonyms, use in idioms and etymology. In the case of a physical dictionary, one would only see the word, phonetic representation, and a few, but not all, short interpretations.

The response goes on to provide more detail, and I’ve included the full response in Appendix K.

cloud [klaud] [SHOW IPA](#)  
 See synonyms for: [cloud](#) / [clouded](#) / [clouds](#) on [Thesaurus.com](#)

- noun**
1. a visible collection of particles of water or ice suspended in the air, usually at an elevation above the earth's surface.
 2. any similar mass, especially of smoke or dust.

[SEE MORE](#)

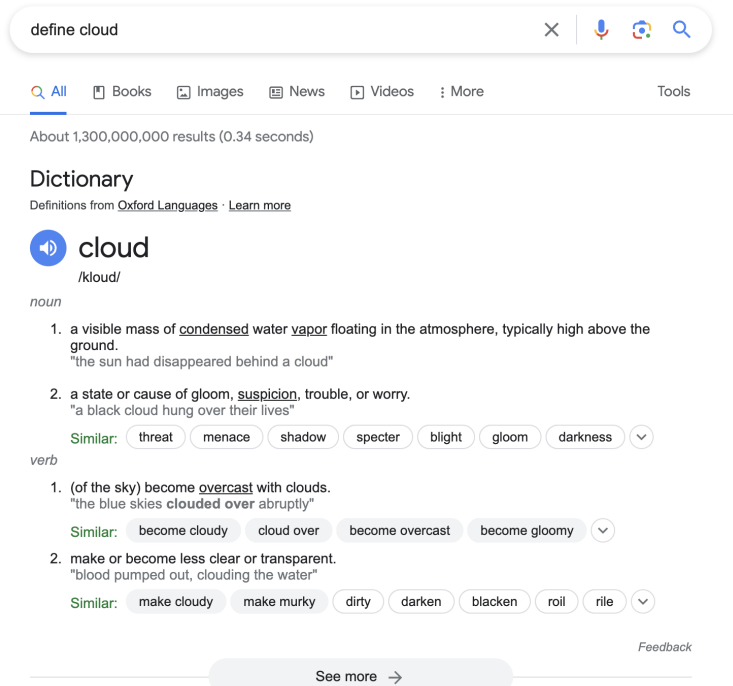
- adjective** *Digital Technology.*
8. of or relating to [cloud computing](#):
cloud software; cloud servers.
 9. relating to or doing business on the internet:
Google and other cloud companies.




- verb** *(used with object)*
10. to overspread or cover with, or as with, a cloud or clouds:
The smoke from the fire clouded the sun from view.
 11. to [overshadow](#); [obscure](#); [darken](#):
The hardships of war cloud his childhood memories.
 12. to make gloomy.
 13. (of distress, anxiety, etc.) to reveal itself in (a part of one's face):
Worry clouded his brow.
 14. to make obscure or indistinct; [confuse](#):
Don't cloud the issue with unnecessary details.
 15. to place under suspicion, disgrace, etc.
 16. to variegate with patches of another color.

[SEE LESS](#)

Figure 5.1
 Dictionary.com entry for 'cloud'
 (Dictionary.com, 2023).

When I search for 'cloud' on Dictionary.com, it presents a few different definitions, the phonetic representation, and if I scroll down, idioms, origin, synonyms, and nearby words. I don't know about you, but when I hear cloud, I think of the fluffy white things in the sky.




define cloud ×   

[All](#) [Books](#) [Images](#) [News](#) [Videos](#) [More](#) Tools

About 1,300,000,000 results (0.34 seconds)

Dictionary
 Definitions from [Oxford Languages](#) · [Learn more](#)

 **cloud**
 /klaʊd/

noun

1. a visible mass of [condensed](#) water [vapor](#) floating in the atmosphere, typically high above the ground.
 "the sun had disappeared behind a cloud"
2. a state or cause of gloom, [suspicion](#), trouble, or worry.
 "a black cloud hung over their lives"

Similar: [threat](#) [menace](#) [shadow](#) [specter](#) [blight](#) [gloom](#) [darkness](#) ⌵

verb

1. (of the sky) become [overcast](#) with clouds.
 "the blue skies clouded over abruptly"
2. make or become less clear or transparent.
 "blood pumped out, clouding the water"

Similar: [make cloudy](#) [cloud over](#) [become overcast](#) [become gloomy](#) ⌵

Similar: [make cloudy](#) [make murky](#) [dirty](#) [darken](#) [blacken](#) [roil](#) [rile](#) ⌵

[Feedback](#)

[See more](#) →

Figure 5.2
 Google search "define cloud."

Dictionary.com's entry for 'cloud' first presents the meaning with which I most strongly associate the word. It is followed by other meanings, like the technical meaning associated with 'cloud computing' or affectual senses. If you weren't using a physical dictionary, or ChatGPT, you might enter into Google "define cloud" to find the dictionary definition.

I instructed ChatGPT to “Define Cloud”, and it provided a long, technical explanation of a cloud in the context of *cloud computing* (see Appendix J). In another chat (see Appendix K), I asked “What is a cloud?”. ChatGPT generated a similar, but far more detailed, still technical, response. I asked ChatGPT why it chose to explain the meaning of ‘cloud’ in a scientific register. It provided a long-winded explanation of cloud computing’s relevance and pervasiveness in society. I followed up by saying that I’m not interested in a technology-related meaning. It then gave me a range of meanings, where the general meaning of ‘cloud’ (in the sky) as last. So even when we ask for a word to be explained in a general context, ‘Generic context’ is last in its list. That might be more helpful than it defaulting to field-specific meaning, but still not what we asked it to do.

Unknowns

A language learner might *not* be studying CS. They ask for help with the meaning of a word. They don’t know the meaning, they don’t remember the context, they don’t know the translation into another language that they know. How does a learner deal with this issue?

Ask it for dictionary definitions.

Say they want the meaning in a general context.

Continue to ask about the word in different ways.

They could also use a real dictionary or ask a person.

I said at the top of the section that I had to specify that words should be explained in general contexts to receive non-jargon generated explanations. The first way I tried to do this was by asking explicitly for the dictionary entry.

ChatGPT’s Dictionary Entry for ‘Cloud’

(ChatGPT-3.5) [11-04-23]

LL

What’s the dictionary entry for ‘cloud’?

I’m unable to provide the full dictionary entry for ‘cloud’ since it may be quite extensive. However, I can provide a concise definition for you:

Cloud (noun):

A visible mass of tiny water droplets or ice crystals suspended in the atmosphere, typically high above the ground, that appears white or gray and often brings precipitation.

A large, shapeless mass or collection of something, typically smoke, dust, or steam.

Computing: A network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.

If you need more specific information or details related to a particular context, feel free to ask.

Finally, we get another meaning without further prompting. But it is interesting how, when I ask for a dictionary entry, it declines to do so in full on the basis of length, after providing paragraphs long definitions

of ‘cloud’ associated with computing (see examples in Appendices J and K), a meaning we didn’t expect or particularly want. In declining to provide a complete dictionary entry, it excludes phonetic representations, synonyms, and example sentences.

What if someone doesn’t *think* they need to specify ChatGPT should present the meaning in a general context, or that it should present multiple meanings? First, a learner would have to know that the vocab they are looking for doesn’t have a homonym. They would also need to know to be explicit about that.

Unknowns

What might some impacts on a learner be, of ChatGPT’s defaulting to jargon definitions?

They might feel overwhelmed by the amount of information.

They become frustrated and jaded with a lack of helpfulness.

They may adopt an inappropriate core meaning.

Again, it is interesting that in Chapter 2.7 ChatGPT said “I might not cover very specialized or field-specific vocabulary, and it’s important to supplement this with context and practice.” ChatGPT tries to cover jargon well, but how does it do with detailed information about jargon? This is what we’ll look at in the remainder of this Chapter: acquiring jargon for [ESAP](#) in [CS](#).

5.2 ESAP Exploration Methods

5.2.1 Setting Context for ChatGPT in ESAP

Chapter 5.3 provides examples specific to [ESAP](#) vocabulary in [CS](#). For this narrowed exploration, I have added Custom Settings that specify the relevant field relevant to the learner’s inquiry, the learner’s education level in that field, and the learner’s English proficiency level.

I have chosen to use [CS](#) as the example discipline due to the high number of international [EAL](#) students in Canadian post-secondary [CS](#) programs. I intend for the examples provided to be sufficiently transparent and transferable but leave it up to the reader to extend the exploration to their own field.

International English Language Testing System (IELTS) is a standardized English language proficiency assessment. Many major academic institutions require students to provide formal exam results illustrating a minimum English proficiency level of IELTS 6.5 (or equivalent in another assessment, as shown in Table 5.3), with no lower than 6 in any given section.

ChatGPT Tip

Each chat should begin by the human providing as much context as possible to support ChatGPT in simulating accommodation and interacting appropriately for the learner’s situation. If the user has the Plus subscription, this can be eased by using ‘Custom Settings’ that will carry specified context across all chats, such as their L1, L2, L2 proficiency, academic discipline and education level.

Test	Minimum score
CAEL	70, with no section less than 60
IELTS (Academic)	6.5, no component less than 6.0
MET (4-skill only)	64
TOEFL iBT (Internet-based test)	90, with no section less than 20
TOEFL PBT (paper-based test)	575

Table 5.3
University of Victoria's English Language Proficiency Test Requirements.

5.2.2 Register

Here we look at the importance of informing ChatGPT of the intended register, in our case, **ESAP**, specifically **CS**. We'll follow up by looking into the challenges with communicating at an appropriate language proficiency level.

ChatGPT *can* accommodate to register, but won't do so unprompted, as illustrated in the following dialogue. The first response returned general meanings, not as **CS** jargon, so I followed up by asking for technical definitions specific to **CS** jargon included in the Computer Science Academic Vocabulary List (CSAVL) (Roesler, 2021).

Top ten words in the CSAVL:

1. System (noun)
2. Data/datum (noun)
3. Algorithm (noun)
4. such (adjective)
5. base (verb)
6. node (noun)
7. model (noun)
8. case (noun)
9. program (noun)
10. information (noun)

Defining top ten words in the CSAVL

(ChatGPT-3.5) [08-14-23]

LL

I am a first year undergraduate computer science. I'm **EAL** with an **IELTS** proficiency of 6.5. Define these 10 words: [lists top ten words].

CG

*ChatGPT provides definitions for the words in general context, not as jargon, specific to **CS**, e.g.:*

1. System (noun): A system refers to a collection of interconnected or interrelated parts that work together to perform a specific function, achieve a particular goal, or produce certain outcomes. It can range from physical structures to abstract concepts and can involve various components that interact with each other to create a unified whole.

8. Case (noun): In a general sense, a case refers to a specific instance or occurrence of something. It can also pertain to a particular situation, scenario, or set of conditions that need to be considered, examined, or addressed.

See Appendix D for all definitions.

LL

Are those definitions all specific to the word's core meaning in the discipline of computer science?

CG

I aimed to provide definitions that are relevant to the discipline of computer science, but some of the terms can also have broader meanings that apply beyond computer science. Here's a more computer science-focused perspective for each term

1. System (noun) - In computer science, a system refers to a collection of hardware, software, and processes that work together to perform specific tasks. It can include operating systems, software applications, and various components that interact to achieve computing goals.

Case (noun) - In computer science, a 'case' can refer to different branches or scenarios within a program's logic, often associated with conditional statements (like switch or if-else statements) for handling different conditions.

See Appendix D for follow-up definitions.

I informed ChatGPT in the prompt that we are studying **CS**, and our specific language proficiency level. However, the definitions given

without further prompting were bordering between being defined in a general context and as jargon.

Both sets of definitions provided were returned at native speaker proficiency, not tailored to the speaker's stated English proficiency. This tells us that it doesn't automatically accommodate to the speaker's stated proficiency level, and won't infer from the speaker stating their linguistic proficiency level that it should also speak to that level. We will next explore what it would look like for ChatGPT to communicate at a specified proficiency level, and the complexities in attempting to do so.

5.2.3 Proficiency Level

Chapter 4 aimed to illustrate EGP use cases in various language scenarios and domains. It also explored different use cases for it within ALL, such as asking for pronunciation explanations and creating a vocabulary book. The examples illustrated its ability to fulfill a wide range of requests, and also showed that the generated outputs were filled with cultural and linguistic biases which would be potentially detrimental or harmful to a language learner. One thing that none of the examples appropriately incorporated was a learner's proficiency level in the target language, which would likely affect the ability for the learner to comprehend ChatGPT's output and obtain factual knowledge they desire.

A huge selling feature of ChatGPT is that it generates text at a native-like level, but the disadvantage of that is the outputs will too linguistically advanced for an individual using CG *to learn* that language. So how do we fix that?

In Chapter 4.2, we saw in Table 4.2 that ChatGPT accurately marked 40% of answers Jackie provided in response to a grammar quiz ChatGPT itself generated. This illustrated its failings in identifying prescriptive grammatical errors in a structured context, rather than just rewriting an ungrammatical sentence. That it occurred during a quiz requested in order to determine Jackie's English proficiency level raised questions about its ability to gauge and/or assess one's proficiency level.

- If ChatGPT assessed Jackie's answers to all be correct, why did it say they had an intermediate proficiency in English? What would have happened if it had a 100% assessment accuracy?
- On what grounds were the questions chosen?
- How do we know that the questions were reflective of those which an intermediate, but not beginner speaker would expected to know?
- Did the questions allow for Jackie's proficiency to be deemed as 'advanced'?
- What do 'beginner' and 'intermediate' proficiencies even mean?

Somehow, when I asked for a definition of 'cloud,' it generated a CS definition, but when I provide context about myself, it gives general definitions.

I prompted ChatGPT-4 to generate and assess a mock CEFR test to compare the method of assessment it generated (see Appendix L). Instead of presenting prescriptive grammar questions, it only used short answer questions. It nevertheless provokes the same issues of arbitrary designation of language proficiency, as exhibited in the assessment by ChatGPT-3.5.

Jackie said they wanted their proficiency assessed according to the CEFR. But the CEFR grades are on a 6-level scale, not a 3-level scale.

I don't have any of the answers to these questions, and therein lies the problem. In fact, it just leads to more conundrums.

Unknowns

Say a learner were wanting to see if they were ready to take an official (*and paid*) language proficiency test.

It would be understandable that they would take ChatGPT's assessment at face value.

Would they know to check the proficiency level for which the questions are appropriate?

If they didn't know their answers weren't being marked properly, how would they know to go elsewhere to verify the accuracy of their responses?

Given that we don't know what 'beginner', 'intermediate' and 'advanced' English proficiency level means to ChatGPT, how can we trust its ability provide materials appropriate to the learner's actual proficiency level?

This example showed us that asking for a proficiency assessment is ineffective, further reinforcing that it's unreliable as an assessment tool. The remainder of this chapter addresses language acquisition, specifically vocabulary, in [ESAP](#). This is one situation where it's imperative to the learner that ChatGPT provide them with comprehensible and factually accurate responses. Were the learner to receive inaccurate information during the acquisition of vocabulary in [ESAP](#), it would most likely have negative impacts on the success in their academic endeavours, potentially extending into their subsequent career should they then successfully reach that point

If our goal is to use ChatGPT to aid in vocabulary learning, it only stands to reason that ChatGPT should communicate with the learner at their proficiency level. In the following example, I paste in a definition ChatGPT gave me for [CS](#) jargon 'cloud', and ask what the coverage rating is as per the Cambridge FCE list. It concludes with the claim that 90% of the words in the paragraph are at an [IELTS](#) 6.5 proficiency level, and that it is an appropriate level of coverage for an [IELTS](#) 6.5 speaker to be presented with. This claim differs from that by [Nation \(2001\)](#), who says a text should have 98% coverage of words familiar to a learner in order for them to successfully infer meanings of the unknown vocabulary. This percentage was later challenged by [van Zeeland and Schmitt \(2012\)](#) to be 95%.

I make a distinction between 'factually inaccurate' and 'biased' here, where 'factually inaccurate' is objectively incorrect, and 'biased' is the *unbalanced*, unfair, and or unreasonable presentation of information, regardless of accuracy.

ChatGPT Tip

Note that, for outputs to be at specific, or even approximate linguistic proficiency levels, it is insufficient to include in the prompt "I'm a beginner level speaker." or "tell me simply...". If prompted to explain to a certain age demographic, it will not only simplify the language, but also the concept and/or content. This is for the same reasons addressed in the exploration of simulating a language proficiency test.

ChatGPT assesses proficiency coverage

(ChatGPT-3.5) [08-14-23]

LL

What percentage of words in the following text are in the Cambridge FCE?

"In computer science, the term 'cloud' refers to a network of powerful computers that store and manage data and programs. These computers are connected through the internet, allowing users to access and use resources like storage, applications, and processing power without needing to have those resources physically on their own devices. Cloud technology is widely used for various purposes, such as storing files, running software, and hosting websites. It offers convenience and scalability, making it a fundamental concept in modern computing."

CG

Around 90% of the words in the passage are likely to be found in the Cambridge English First (FCE) word list. This demonstrates a strong use of vocabulary suitable for your current language proficiency level.

LL

You think a 90% coverage based on the FCE is sufficient for a speaker at an IELTS 6.5 level?

CG

A 90% coverage of words from the Cambridge English First (FCE) word list indicates a strong level of vocabulary for someone at an IELTS 6.5 level. This suggests that you have a good grasp of vocabulary relevant to your current language proficiency.

I set out to determine what proficiency level ChatGPT must be instructed to target in order to reach a minimum of 95% adjusted coverage, where adjusted coverage excludes the word being defined, as well as any proper nouns.

To do this, I requested explanations for the top five computer science-specific words in Roesler's (2021) Computer Science Academic Vocabulary List (CSAVL). I did this in 3 separate chats (see Appendix M, requesting that responses be written at IELTS levels 5.5, 6.0, and 6.5, respectively, resulting in 15 explanations. I then calculated coverage ratings for each explanation to see which target proficiency level yielded the vocabulary coverage percentages to that recommended by Nation (2001) and van Zeeland and Schmitt (2012). Coverage ratings are shown in Table 5.4. That is, did the output intended for a 6.5 IELTS level have a 95-98% coverage of vocabulary at an 6.5 IELTS level, or was it necessary to prompt for a lower IELTS proficiency level in order to achieve 95-98% coverage?

Coverage was calculated using the Online Graded Text Editor (OGTE). 100% coverage means that all words in the text are also in the chosen word list, in our case, the FCE. More information on the OGTE is included in Appendix E.

Word	5.5	6.0	6.5	CSAVL
system (noun)	96.4%	83.6%	89.8%	1
data (noun)	96.4%	86.7%	88.4%	2
algorithm (noun)	94.8%	87.4%	90.2%	3
base (verb)	97.9%	91.9%	95.7%	5
node (noun)	95.7%	88.9%	93.3%	6
modulation (noun)	93.4%	84.8%	85.1%	681

Since it's unreasonable for us to create a comprehensive list of words in our lexicons, we'll use the Cambridge First Certificate in English (FCE) (aka B2 first) word list to calculate the coverage of words at our proficiency level (aka. proficiency coverage, or coverage ratings), which again is equivalent to CEFR and IELTS 6.5. The OGTE doesn't include an option to select an IELTS word list, but the FCE word list, is an equivalent proficiency level to CEFR B2 and IELTS 6.5.

Table 5.4

Coverage Ratings for 5 words, instructing ChatGPT to define them at IELTS levels 5.5, 6.0, and 6.5.

Prompting for definitions at an [IELTS 5.5](#) level resulted in outputs surpassing our 95% coverage goal in the first 5 words (which occur at the beginning of the CSAVL, the highest frequency words in [CS](#) texts), and the last case, ‘modulation’ (which occurs higher in the CSAVL, less frequently in [CS](#) texts) nearing a 95% proficiency coverage, but far better than better coverage than the other two proficiency targets.

For reasons I can’t identify, coverage was lower when targeting [IELTS 6](#) than for 6.5. I encourage further testing of proficiency level compliance to investigate why that is, and whether ChatGPT is inept at accommodating to proficiency level or if there’s a better method to compare output and target proficiency levels. Regardless, it required explicit details about the target English proficiency level of its outputs, forcing it to include even less advanced vocabulary in its outputs.

5.2.4 Declaring Custom Settings

Based on parameters addressed in this section, I declare custom settings prior to exploring its behaviour in [ESAP](#) vocabulary learning tasks. In an attempt to shorten the length of outputs, I instruct it to omit hedging language in outputs about a need to fact check, and to not remind us that it’s a language model. I provide register details: the location is Canada, the environment is a university, and the field is computer science. I say I have an [IELTS 6.5](#) proficiency, but based on the results of the proficiency testing in [Section 5.2.3](#), direct it to generate outputs for [IELTS 5.5](#).

Custom Settings for ESAP Case Study

What would you like ChatGPT to know about you to provide better responses?

I am an [EAL](#) speaker with a [IELTS](#) score of 6.5 in all categories. I am a first year undergraduate computer science major at a Canadian university.

How would you like ChatGPT to respond?

I know you are an AI model and that the information you provide may not be factual, accurate, or current and I need to fact-check your responses, so please don’t remind me of that. Speak to me at an [IELTS 5.5](#) proficiency level. When explaining concepts or definitions, assume I want to know them in the context of first year undergraduate computer science. Keep your responses concise.

5.3 Learners Using ChatGPT for ESAP Vocabulary

In this section, we’ll see that ChatGPT cannot and should not be used by students to bridge English proficiency gaps with the necessity to learn jargon, unless the professor is willing to fact check the outputs ChatGPT generates for their students.

I feel that it’s better to provide simpler definitions than more complex by default, as long as it’s still providing definitions in the context of [CS](#). The complexity can come through discourse, lectures, reading, and other information that comes with encyclopedic knowledge.

ChatGPT Tip

Note that, for outputs to be at specific, or even approximate linguistic proficiency levels, it is insufficient to include in the prompt “I’m a beginner level speaker.” or “tell me simply...”. If prompted to explain to a certain age demographic, it will not only simplify the language, but also the concept and/or content. This is for the same reasons addressed in the exploration of simulating a language proficiency test.

ChatGPT Tip

I use custom instructions to ease the process of generating examples and to ensure cleaner and more consistent prompts and outputs. If you as a user are using the Freemium version, such information should be provided at the beginning of each new chat. Without providing explicit details ChatGPT’s outputs may be misaligned with your intentions, whether or not it’s particularly obvious.

So far, we've explored ChatGPT as an AI tool or tutor for EGP and prepared to transition into learning vocabulary in an ESAP context. This section situates jargon in learning ESAP. In this section I'll show how one could go about using ChatGPT to learn jargon and how that might work out using some vocabulary acquisition strategies put forth by Schmitt (1997).

Vocabulary is foundational to both LL as well as success in academia, yet post secondary educators are struggling to incorporate extra supports for vocabulary acquisition for EAL students into their courses (Lin & Lin, 2019; Minshall, 2013). Much research has been conducted over the years on L2 vocabulary acquisition methods (Nation, 1990; Schmitt, 1997, 2000), in ESAP (Charles, 2012; Kohnke & Ting, 2021), and more recently in Mobile Assisted Language Learning (MALL) (Hockly, 2016; Underwood, 2016). In theory, students could use ChatGPT to supplement classroom instruction and course materials like textbooks by asking for support with learning and understanding jargon during and outside of class. This would save the student time and effort, as well as reduce the demands on the professor.

Consider...

A Policy Paper published by the Department for Education - updated ongoingly - on Generative AI in education includes a section entitled "Using AI Effectively." It includes two points and a summary warning which I will provide support for through the examples in this chapter:

We can only:

- learn how to write good prompts if we can write clearly and understand the [field] we are asking about.
- sense-check the results if we have a schema against which to compare them.

Generative AI tools can make certain written tasks quicker and easier, but cannot replace the judgement and deep subject knowledge of a human expert. It is more important than ever that our education system ensures pupils acquire knowledge, expertise and intellectual capability. (2023)

Their points emphasize that generative AI tools, like ChatGPT, require technological competence such that one can guide the tool to the right spot, and the field-specific knowledge to fact check its outputs. I'll be showing in this chapter that a lack of field-specific knowledge and an absence of guidance to the learner by a human educator can result in the learner being misled in their learning journey.

Considering students in a first-year post-secondary course, according to the policy paper compiled by the Department for Education (2023), the user should clearly understand the content of the field whose content they're using ChatGPT to gain or strengthen knowledge in. Additionally, they should have sufficient knowledge in the language in which they're prompting ChatGPT and interpreting its outputs. This causes a conflict, as the student is in the course *in order to* learn the content, and must learn the content in English, which they are also still learning.

Schmitt's (1997) vocabulary learning strategies taxonomy covers word factors including but not limited to form, function, and encyclopedic knowledge. They also aim to build and strengthen both productive and receptive knowledge.

It was mentioned in explained in Chapter 2.5.2 that word lists, when used in behaviourist methods like repetition and used with flashcards, are ineffective because such uses omit engagement with the field-specific

Productive knowledge: A speaker's ability to produce a word, written or verbally, that's appropriate for its intended purpose. (Schmitt, 2000)

Receptive knowledge: A speaker's ability to recognizing the core, or additionally encyclopedic meaning of a word provided in written or oral form. (Schmitt, 2000)

knowledge behind the vocabulary. However, a word list will guide our selection of CS jargon to use in remaining ESAP exploration.

Section 5.1.1 showed that ChatGPT will default to some context based on its own opaque judgements unless one is specified, without first asking for clarification. In the case of ‘cloud,’ it defaulted to the context of CS, but we’ll see in the following section that it doesn’t always do that.

5.3.1 Word Lists

Ideally, we could ask ChatGPT for an established word list, like by Roesler (2021) or Minshall (2013). I ask for Minshall’s word list and ChatGPT tells me it’s not aware of it, and in fact that it’s not aware of *any* established computer science word lists. It does, however, make alternate suggestions for how to create my own.

One could argue, myself included, that ChatGPT not having access is a good thing; a protection of Copyright. This is an ongoing issue and one to keep an eye on.

Asking for a Computer Science Word List

(ChatGPT-3.5) [09-02-23]

LL Do you know Daniel Minshall’s Computer Science Word List?



I’m sorry, but as of my last knowledge update in September 2021, I am not aware of a “Daniel Minshall’s Computer Science Word List.” It’s possible that this term or resource has emerged after my last update, or it might not be widely known within the scope of my training data. If it’s a specialized or recent development, I recommend checking more current sources or providing additional context so I can better assist you.



I’d like a word list for computer science. Do you know of an academically established word list?



As of my last update in September 2021, I’m not aware of a specific academically established “word list” for computer science authored by Daniel Minshall or anyone else. However, in the field of computer science, there are many terms, concepts, and keywords that are commonly used. Some of these might be found in textbooks, research papers, and educational resources. Here are some general categories and topics that you might consider when creating your own word list for computer science:

Programming Languages: Keywords and concepts related to programming languages such as Python, Java, C++, etc. Data Structures: Terms related to arrays, linked lists, stacks, queues, trees, graphs, etc. Algorithms: Keywords and concepts for sorting, searching, graph algorithms, dynamic programming, etc. Software Engineering: Terms related to software development processes, design patterns, testing, debugging, etc. Networking: Keywords for protocols, networking concepts, IP addresses, routing, etc. Databases: Terms related to database management systems, SQL queries, normalization, etc. Operating Systems: Concepts like process management, memory management, file systems, etc. Artificial Intelligence and Machine Learning: Keywords related to neural networks, training data, algorithms, etc. Cybersecurity: Terms for encryption, authentication, penetration testing, etc. Web Development: Concepts like HTML, CSS, JavaScript, web frameworks, APIs, etc. You can compile a word list from various sources like textbooks, online courses, academic papers, and resources from established computer science institutions. If you’re looking for a comprehensive and up-to-date resource, you might consider referring to textbooks or online courses used in university computer science programs. Additionally, organizations like the Association for Computing Machinery (ACM) might have glossaries or terminology resources that could be useful.

Notice that it doesn’t suggest published word lists, *like* Minshall or Roesler’s, but leaves it up to the user to decide for themselves the parameters needed in a word list. Sometimes a quick Google or Google Scholar search is more appropriate than using ChatGPT.

In November 2023, I asked ChatGPT-4 which can run live web-searches for the top ten words of Daniel Minshall’s CSAVL. It returned [this link](#), which leads instead to the CSAVL created by Roesler (2021). It does however list the correct top ten words from Roesler’s list.

5.3.2 Determination Vocabulary Acquisition Strategies

The examples used so far in this chapter, and to be covered in this section, are guided by the *determination* strategies from Schmitt's (1997) taxonomy. Word form includes affixes and roots. I'll look at how ChatGPT fairs with such information. Spoiler: It doesn't fair well. I mentioned in Chapters 2.1.3 and throughout Chapter 4 that ChatGPT lacks knowledge and understanding of prescriptive grammar. You might think this would exclude parts of words - information which one could get from a dictionary - but we'll see that this is not the case, using the CS jargon: 'algorithm'.

Dictionary.com entry 'algo'.

It's true that 'algo' is short for 'algorithm' but 'algo' is also a **programming language**, and the name of many companies. It isn't a root, but rather a clipping.

Try this

"Analyze the root and affixes of 'algorithm'." implies that 'algorithm' has a root and at least one affix. Consider the consequences of such an assumption.

'algo=' and/or '-rithm':

A. are affixes.

B. are roots.

C. bare either core meaning or function.

D. trick question: the word cannot be broken down further.

Analyze root and affixes of 'algorithm' (ChatGPT-3.5)

[16-08-23]

LL Analyze the root and affixes of 'algorithm'.

Sure, let's break down the word 'algorithm' in the context of computer science:

Root: The root of the word 'algorithm' is 'algo.' In computer science, an algorithm is a step-by-step procedure or set of instructions for solving a specific problem. 'Algo' in this context refers to a systematic approach to solving problems. Affixes: 'Algorithm' does not have any common affixes, such as prefixes or suffixes, in the context of computer science. It's a standalone word used to describe a fundamental concept in the field.

So, in summary, the root of 'algorithm' is 'algo,' which represents a systematic approach, and there are no affixes commonly associated with this word in computer science.

LL If algo is a root, what about the rest?

In the word 'algorithm' in the context of computer science: 'Algo' is the root, representing a systematic approach. '-rithm' is the suffix. It is used to form the word and doesn't carry a specific meaning in this context. It's essentially the ending of the word that, when combined with the root 'algo', forms the complete term 'algorithm.'

So, to summarize, 'algo' is the root, and 'rithm' is the suffix that together make up the word 'algorithm' in computer science.

I did extensive testing with this example, included in Appendix N. The extensive testing was done without the custom instructions, i.e., in L1 proficiency, not specifically in the context of computer science. It further illustrates referential presupposition accommodation - it assumes based on a reference of affixes and a root, that there must be in fact, a root and at least one affix - lacking understanding of morphology, as well as hallucinations and general confusion.

In order to analyze a word's affixes and root, it must be a possibility

that a word not have any affixes. The example illustrates ChatGPT presupposing that there is in fact an affix present. It does this at the cost of correctness, providing a false analysis.

I received the following, ideal, response through extensive testing.

In English, 'algorithm' is typically considered a base word rather than a root. A base word is a word to which prefixes or suffixes can be added to create derived or inflected forms. In the case of 'algorithm,' it was derived from the name of the Persian mathematician al-Khwarizmi and has not typically undergone further affixation in English. While it can serve as a base for creating related terms (e.g., 'algorithmic'), it is not a root word in the traditional linguistic sense, which is a word that cannot be further divided into smaller meaningful units.

ChatGPT Concedes 'Algorithm' is a Base Word.

Let's try with an easier example which in fact does contain an affix: 'information.'

Analyze root and affixes of 'information'

(ChatGPT-3.5) [09-13-23]

LL

Analyze root and affixes of 'information'

Sure, let's break down the word 'information' in the context of computer science:

Root: In the context of computer science, the root of the word 'information' is 'inform.' This word means to provide data or knowledge to someone. In computer science, it often refers to the process of conveying data or knowledge through digital systems, like computers.

Affixes: 'Information' has two affixes in English:

- **Prefix:** There is no prefix in the word 'information.' A prefix is a group of letters added to the beginning of a word to modify its meaning. In computer science, prefixes are used in various programming languages to denote specific operations or data types. For example, 'un-' is a prefix that can be used to negate a boolean value, as in 'untrue.'
- **Suffix:** The suffix in 'information' is '-tion.' In computer science, this suffix is used to form nouns from verbs or other nouns. For instance, 'compute' becomes 'computation' in the context of computer science, referring to the act of performing calculations or processing data.

So, in summary, 'information' in computer science relates to the process of conveying data or knowledge through digital systems, and it's formed from the root 'inform' and the suffix '-tion.'

So from just the word 'algorithm,' we see that ChatGPT doesn't reliably decipher a word's root and affixes. It doesn't always know what *can* be a root or affix. Shown in the examples in Appendix N, ChatGPT will makes up words and is willing to make up definitions to suit. I was hoping it would fair better with a word like 'information.' But its response is hardly coherent. It says there are two affixes, but goes on to say that there is no prefix (when in fact 'in-' is a prefix) and that the suffix is '-tion,' though it is actually '-ation.' That leaves the root to be 'form,' not 'inform' as ChatGPT said it was. It also seems to imply that the word form would be different in CS jargon, when that is untrue, at least in this case.

5.3.3 Memory, Cognitive, and Metacognitive Vocabulary Learning Strategies

We've looked at *determination* strategies in the category for *newly* discovering a word's meaning from Schmitt's (1997) taxonomy, but Nagy et al. (2012) say that the best way to understand field-specific vocabulary is by studying field-specific texts, not by learning field-specific vocabulary in isolation. Strategies for this kind of learning would include *cognitive* and *metacognitive* strategies, which we will look at now.

Nagy et al. (2012) recommend jargon be used through activities that engage with word meaning, focusing on strengthening encyclopedic knowledge over core features, like spelling, pronunciation, and form. Hockly (2016) says that MALL is currently most set up for behaviourist, or *determination*, strategies. He says that activities that require engagement with meaning and how words further a learner's communicative competence should be facilitated by a supervisor who can guide learner interactions and fill in gaps the learners may encounter. If we expect that ChatGPT can take on the role of a human instructor or tutor, we might be inclined to use it to fill that gap in current MALL activities to follow Nagy's recommendations. However, using Schmitt's taxonomy, it's clear just by looking at the strategies, that ChatGPT will be ineffective in carrying out the strategy. I'll briefly explain in what ways each strategy is and isn't appropriate and whether it can be facilitated with the free version of ChatGPT.

TOTAL PHYSICAL RESPONSE

TPR examples
(ChatGPT-3.5) [08-15-23]

LL

What are physical movements I can do to remember 'node' (noun)?

Certainly! Physical movements can help reinforce memory. Here are some movements you can associate with [the word]:

Node (noun):
 Gesture: Extend your fingers to represent branches, like a tree.
 Movement: Extend your arm and create a branching motion with your fingers, symbolizing a node's connection in a network.

CG

By associating physical movements with [the word], you engage multiple senses and learning modalities, which can enhance memory and understanding.

Studying a Word with a Picture

This is not a strategy that can be facilitated by ChatGPT-3.5, and I am told as much when I request it.

'Node' Pictorial Representation (ChatGPT-3.5) [11-23-23]

LL Draw a picture of a node in CS.

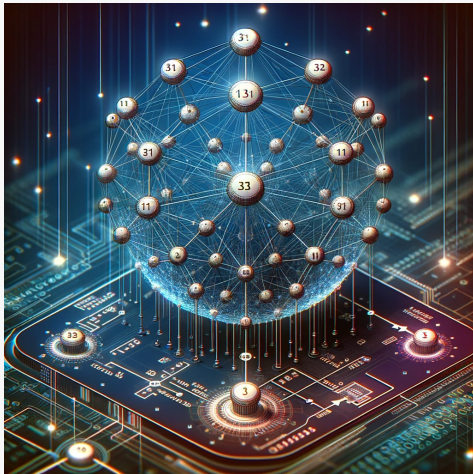
I'm sorry, but I can't draw pictures as text-based AI. However, I can describe what a node is in the context of computer science. In computer science, a 'node' typically refers to an essential part of data structures like linked lists, trees, or graphs. A node is a fundamental building block that stores some data and has one or more references (pointers) to other nodes.

For instance, in a singly linked list, a node would contain two things: the actual data and a reference to the next node in the list. In a tree or graph, a node could represent an element or entity, and it would have references to its child nodes or adjacent nodes.

Very recently, Plus subscribers gained access to a new multimodal feature that works with external materials, such as text and image files. It can both interpret and generate files.

'Node' Image (ChatGPT-4) [11-23-23]

LL Draw a picture of a node in CS.



Here's an illustration depicting a node in computer science, complete with connections to other nodes.

Figure 5.3
ChatGPT Generating an Image from a Text Prompt.

ChatGPT Tip

Always keep your eye out for new features! If you see a new feature but don't quite know what it is or what to do with it, enter [name of the feature]+ ChatGPT into your preferred search engine. There are sure to be descriptions and use cases for it.

WORD TESTS

CS textbooks such as *Starting Out with Python* by Gaddis (2021) have word tests at the end of each chapter, but also the answer key. Teachers and students could use ChatGPT to supplement those.

This quiz addresses core meaning of the provided vocabulary.

Word tests

(ChatGPT-3.5) [08-14-23]

LL Make me some word tests for nouns: tree, node, model, point, type.

Here are some word tests to help you reinforce your understanding of these terms:

Test 1: Match the Term

Match the correct term to its definition.

- | | |
|---|----------|
| A. A structure made up of interconnected branches. | a. Tree |
| B. A specific location or value in a dataset. | b. Point |
| C. A particular kind or category of something. | c. Type |
| D. An object that represents something in a system. | d. Model |
| E. A hierarchical arrangement of elements. | e. Node |

Test 2: Fill in the Blank

Fill in the blanks with the appropriate term.



- The ____ of a computer program defines its behaviour and properties.
- In a database, each ____ contains specific information about an entity.
- A decision in a flowchart is often represented by a diamond-shaped ____.
- The programming language specifies the data ____ of a variable.
- The parts of a family tree can be seen as ____ connected by lines.

Test 3: True or False

Determine if the following statements are true or false.

- A node in a network can only have one connection.
- A model is a graphical representation of a physical object.
- A point in programming refers to a line of code.
- A type defines the structure and behaviour of objects in object-oriented programming.
- A tree structure always has a single root node.

Feel free to use these tests as practice to reinforce your understanding of these terms.

Let's look at another type of quiz. This one is simpler, and upon a quick glance, doesn't appear to be an English test at all.

Computer science vocabulary quiz

(ChatGPT-3.5) [08-16-23]

LL

Give me a vocabulary quiz with the computer science jargon: 'base', 'point', 'model' and 'application', where 'base' is a verb and the others are nouns.

Sure, here's a vocabulary quiz with the computer science jargon you mentioned:

Base: In computer science, when you create a new program, you usually **base** it on existing code to save time and effort. What's another word for 'base' in this context?

Point: In a graphical user interface (GUI), you interact with elements by clicking on different **points** on the screen. What is the primary purpose of these interaction **points**?

CG

Model: Machine learning involves training a computer to recognize patterns in data using a mathematical **model**. What does the term **model** refer to in machine learning?

Application: An application is a software program designed to perform specific tasks on a computer. Can you give an example of a productivity application often used in offices or for academic purposes?

Feel free to provide your answers when you're ready!

A key thing to note about this output, though unintended, is that its purpose is to test encyclopedic knowledge of the concepts represented by the provided written forms. It does not test knowledge of the words' core meanings isolated from deeper discipline-specific knowledge. It was discussed in Chapter 2.5 that there is no distinct separation between a lexical item and details of its concept. While the tests in the [word tests] examples address core meaning, the latter goes beyond that. It was also discussed that a struggle in ESAP teaching is the typical lack of discipline-specific knowledge of an EAP teacher, and the already high work load of a professor in a specific discipline that deters them from creating more materials to support EAL students. One of our hopes for ChatGPT was that it would be able to accommodate that gap. We've seen in previous strategies that it can do this in the context of informing students. This example illustrates it further, not only in its ability to test EAL students' understanding of core meaning which would catch them up to an L1 student, but also encyclopedic knowledge which must inevitably be proved to a professor through exams and practice in order to advance through a degree.

5.4 *An ESAP Language Tutor?*

In this chapter, I present a variety of examples, first focusing on meaning in field-specific vocabulary, English proficiency level assessments, and details of the CSAVL. After providing specific information (location, situation, field, and target English proficiency level), I test some vocabulary learning strategies from Schmitt's (1997) taxonomy for the

purposes of learning CS words, acquiring core and encyclopedic knowledge. As I provide more contextualizing information to ChatGPT, it provided me with more optimal outputs. This aligns with examples in Chapter 4, that when information isn't explicitly provided to ChatGPT, it will make its own decisions to fill in the gaps and provide it to the most probable answer based on its training data. ChatGPT gave Jackie a proficiency assessment. We don't know what benchmarks it was measuring against, most likely because it made it up as Jackie didn't provide further information about her general proficiency level. We saw also saw this with Kofi, who told ChatGPT that he was from Ghana, visiting his relatives in America. He didn't specify however that he was looking for information for AAVE English, and consequently, ChatGPT didn't provide phonetic information in English, but in Standard American English. Until it was provided with a specific IELTS proficiency level to target, outputs were at a high English proficiency level, inaccessible to beginner-intermediate learners. In Chapter 2.8, I asked ChatGPT to rate itself as a language tutor. For vocabulary, it said it could provide definitions, synonyms, and example sentences for a wide range of words. It also said it wasn't strong in covering jargon. In this chapter, we saw that it spontaneously offered CS definitions for words that were homonyms in other contexts, without any specific request to frame them within the realm of CS. This indicates that it either has a bias toward the register of CS, and/or make an incorrect self-judgement about its capabilities in providing field-specific vocabulary information. Determination strategies, those which requested information on word form like affixes performed poorly. Were ChatGPT trained for GEC, it might have performed better. Responses regarding CS vocabulary were also more factually accurate in the memory, cognitive, and metacognitive strategy examples. That is great for learners who have the core word knowledge, and are looking for ways to integrate word knowledge with the field-specific knowledge that goes along with it. That being said, the prompts associated with those strategies had specific contextualizing information which optimized the appropriateness of ChatGPT's outputs.

6

Discussion

In this book, I've explored my questions of whether ChatGPT can and should be used in LL, specifically in learning EAL in both general and specific academic purposes, as well as vocabulary learning in specific academic purposes regardless of a learner's first language (L1).

The answers to both of these questions are far from straight forward, so I'll address them individually, but to sum up my conclusions, ChatGPT can be used for language learning, but shouldn't be.

I've shown that ChatGPT has many abilities pertaining to ALLT, including the following:

1. Summarizing and explaining text;
2. Preparing syllabi and lesson plans;
3. Creating grammar and vocabulary quizzes;
4. Explaining vocabulary, grammar, and idioms;
5. Categorizing vocabulary by concepts.

However, it fails often. Examples of failings include the following:

1. Providing generic materials as evidenced in the syllabi and lesson plans;
2. Generating outputs biased toward Standard American English in all domains, as highlighted in its pronunciation instruction;
3. Making assumptions about relevant fields as it pertains to jargon;
4. Inaccurately assessing prescriptive grammar and grammatical information about words;
5. Feigning humanity, creating a misleading sense of trust and reliability.

6.1 Can ChatGPT be used for Language Learning?

ChatGPT told us that it isn't appropriate for language learning, should it be the sole or primary tool for doing so. This self-assessment was evident throughout the examples presented in Chapters 4 and 5. Generated

outputs frequently provided misleading information, be it through subtext, factuality of content, or inaccurate assessment of prompt content, to name a few.

Some example activities seemed to be productive, with minimal apparent risks. These activities included generating a vocabulary book, giving tips on how individuals can begin to learn a language (generally omitting mention of itself in such suggestions), providing general overviews of available official language tests. It seemed to generate quite balanced self-reflections, such as on its suitability as a language tutor, its biases (affectual, towards Standard American English and white culture), and that it's unreliable in providing information requiring deep field-specific knowledge.

ChatGPT generated text at a higher proficiency than that which was requested by the user. However, when asked, it said that it was including vocabulary with a 90% coverage rate as per the requested language. If that coverage rate were supported by the ALLT research, it would have been appropriate, but it is in fact insufficient. Were it aware of such research, it would most likely be capable of appropriately accommodating language proficiency levels. That could be useful for learners, but also for teachers who might want to have it help them generate draft teaching materials based on their students's proficiency levels.

It might not be entirely aware of ALLT research due to copyright protection of academic publications, relying on materials not peer-reviewed or formally published.

That ChatGPT isn't trained to fact find, I feel, is a huge limitation. It generates content based on a range of high-probability factors, including dialect, region, register, the users's language proficiency, without consideration of the users' background, unspoken intent, and so on. Were it to ask questions to order to reduce assumptions, it would decrease many of the risks I've illustrated and stressed. There's naturally an intention behind any action an individual makes, so ChatGPT could access that simply by asking more questions. It could also 'get to know' the individual through interaction across multiple chats in the account, but with that comes privacy concerns.

Mentioned in Chapter 2.1, ChatGPT is known to generate inconsistent outputs (OpenAI, 2022a). This claim, though not illustrated extensively due to space constraints and comprehensive examples exceeded the scope of this book. Inconsistencies are visible in the variety of results I got when attempting to obtain morphological information about the word 'algorithm' (see Appendix N), as well as various ways we saw ChatGPT define 'cloud' throughout Chapter 5. Inconsistencies in outputs poses challenges to attempts in understanding why ChatGPT's outputs may or may not be appropriate or accurate, what causes it, and how outputs can be improved.

6.2 On the Importance of the TPACK Framework

I reference in Chapter 2 Mishra and Koehler's (2006) TPACK framework, and the importance of learners and teachers alike considering technology, pedagogical methods, and content knowledge holistically. On the surface, the examples illustrate that ChatGPT performs only as well as the prompt allows (with the exception of grammar). For someone with minimal digital competence, i.e., doesn't know how to create prompts with sufficient contextual information, they may struggle to get an output that aligns with their goals. If the learner doesn't know what kind of pedagogical strategies can be used for vocabulary learning, they might only get surface help, like synonyms, antonyms, and definitions, rather than support with cognitive strategies. If they don't understand linguistically complex outputs and/or don't have sufficient understanding of the topic, here CS, they might struggle to gauge whether they're receiving factual information, which brings us back to digital competence. If the learner doesn't understand ChatGPT's limitations, or the reasoning behind the limitations, they might place higher trust in ChatGPT, in turn fact-checking its outputs less.

Learners who are lacking knowledge in one or more of these three areas will consequently lack the knowledge that would support ChatGPT in providing outputs supporting the learner's journey. Some risks are that learners put much effort into using ChatGPT for this purpose but the benefits received don't match that effort and the learner is taught incorrect information, which they would likely learn through failed communication, or when tested in their academic programs.

6.3 Limitations of the Research

RESEARCH CONSEQUENCES OF CHATGPT'S RAPID DEVELOPMENT

I wrote this book over an eight-month period... short for a thesis, but dreadfully long when considering the rate at which ChatGPT is developing. Month to month, I attempted to replicate examples, often receiving drastically different results. The examples I've included are those which have been most stable throughout this period. Some have changed so much that I've presented or addressed two versions. This is also the reason I marked each example with a date stamp and gpt model, so that if the reader wants to replicate a prompt, they can do so knowing how much of a gap in time exists between my example and their attempt. The fact that the outputs change, beyond only the wording and extending to a difference in factuality, or ChatGPT's ability to respond to a request at all, has caused me to change the evidence I've presented,

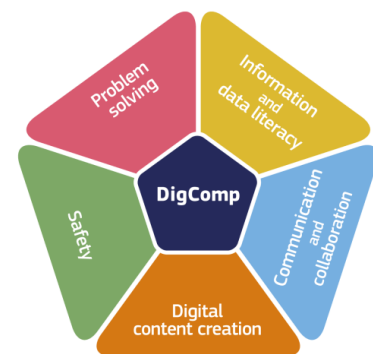


Figure 6.1
EU Digital Competence Framework
(Vuorikari et al., 2022).

or the way that I frame it within the context of the language learning domain.

I aimed to publish this book in a way that it would raise valuable warnings and suggestions (both positive and negative) while ChatGPT was still ramping up. What I didn't want to do was make a bunch of suggestions on how to use it and have those suggestions be completely irrelevant once this was published. The majority of tips I would have included early on are already irrelevant.

LACK OF EMPIRICAL EVIDENCE

I've presented a near-categorical position advocating against the use of ChatGPT for ALLT based on my exploration of its outputs in a variety of LL strategies. I don't have empirical evidence for how a learner or teacher would actually go about using ChatGPT for ALLT, what prompts they might use, and so on. I don't have empirical data of the demographics using ChatGPT for any purpose, like the distribution of first languages spoken by users, their economic backgrounds (access to mobile devices, ability to pay for the Plus subscription). I don't have evidence for how likely a learner or teacher is to find errors in ChatGPT's outputs on their own, and how they might handle them. If I were instead to have decided to conduct an empirical study to begin answering any one (or more) of those questions, before having written this book, I would have been asking the question blindly. I would have had no context for the importance of the question, how the question might relate to a bigger picture, or reference of implications that such empirical data might have on its potential as a LL tutor.

SUGGESTIONS FOR FUTURE RESEARCH

I've presented a near-categorical position advocating against the use of ChatGPT for ALLT. This however is based on experience rather than repetitive and standardized data collection for empirical analysis. Possibilities for future research would include empirical analyses regarding the frequency of errors in ALLT tasks like hallucinating words, incorrectly marking prescriptive grammar assessments, bias of dialect, and assumptions regarding register. Such investigations can alter the weight of the evidence I have provided here, which could lead to a risk-benefit assessment. Because I've only addressed EAL in the examples I've provided, and cannot make claims about its usefulness in learning other languages, replication of this exploration in a different language would yield more insight into ChatGPT's abilities and limitations. Future research would benefit from highly controlled investigations, but would be appropriate only if it is looking at a very specific use case, such as one learner with one life experience using ChatGPT for one purpose at one stage of language proficiency.

I also didn't want to make a handbook for reasons provided thus far, specifically as ChatGPT isn't sufficiently advanced, and currently requires too much digital competency and field-specific education along with knowledge of pedagogical practices in ALLT.

I see my research as potential motivation for other researchers to go out and seek the data to validate or invalidate each of those gaps. If the evidence shows that learners and teachers might be using it in a more levelled and cautious way than I predict based on my own informal interactions with learners and teachers (and teachers-in-training), it could serve to then guide good practices and help situate it in [MALL](#).

I would recommend researchers take preliminary actions before forming their methods. The first is to test out a variety of [LLM](#) interfaces. There are more than just ChatGPT, such as Perplexity, Google Bard and Microsoft Bing. Each of these uses either or a combination of: a different [API](#), [LLM](#), different data, and different parameters which determine behaviour. I would also recommend researchers conduct a preliminary survey to see which is being used more in this area at the time of their research. I also recommend that methodology focus on a tight time frame to reduce the risk of major changes to the platform, and in turn its behaviour that could impact the premise on which the data is being collected.

ACCESSING CHATGPT

ChatGPT isn't available everywhere. [Appendix G](#) lists the countries ChatGPT is available in. It also requires a laptop or mobile device, not something everyone can afford. It also requires a constant data connection, something that does not come cheap in Canada.

The high ratio of English versus non-English data the gpt models are trained on exacerbates inequalities afforded to non-fluent speakers of English ([Brown et al., 2020](#); [Subcommittee on Privacy Technology and the Law, 2023](#)). [Appendix G](#) includes a list, compiled by OpenAI, of countries that ChatGPT is available in.

PLUS SUBSCRIPTION

Since its release in 2022, the volume of ChatGPT use was far higher than OpenAI expected or was prepared for. The result was ever-increasing processing times (speed inverse to the number of users), leaving many users frustrated with waning views of its usefulness. To resolve this, OpenAI presented a subscription option that would prioritize subscribers' activity. The subscription plan, ChatGPT Plus, is available to anyone at a cost of \$20 USD /month. Subscribers have access to beta features (features whose kinks haven't quite been worked out, or pose too much risk to release widely before more testing). There is also a promise, which hasn't held up in my experience, that there will be faster processing times during high-volume periods. Subscribers also have access to ChatGPT interfacing the GPT-4 technology. For someone who relies on ChatGPT for work, the cost is likely be worthwhile. But for a student who wants an easy tool, the cost might well be a hindrance to them.

On November 14, 2023, OpenAI temporarily suspended new sign ups for the Plus subscription due to an overload on their servers ([Wodecki, 2023](#)). ChatGPT subsequently crashed for a few hours on November 21, 2023.

POLICIES IN ACADEMIC INSTITUTIONS

Academic Integrity policies vary by institution or political jurisdiction at this time. The [Department for Education \(2023\)](#) released a policy paper recommending practices and regulations of LLMs in UK education institutes. [Williams \(2023\)](#) provided examples of ways institutions in the United Kingdom are handling the use of ChatGPT, ranging from outright bans (Imperial College) to guidance (University College London), and having no policy on the use of AI (Queen Mary University of London). The ambivalence in such policies are common, with the University of British Columbia publishing the following statement regarding ChatGPT on their Academic Integrity site (2023):

The use of ChatGPT or other generative AI tools does not automatically equate to academic misconduct at UBC. At this time, whether the use of AI tools in courses is or is not allowed is a course or program-level decision and there is no overall, UBC-wide ban on its use in teaching and learning. Individual instructors should clarify expectations with their students early in the term, such as on the syllabus.

6.4 *Continuous Development of ChatGPT*

Over the course of my exploration, ChatGPT's capabilities have changed in the forms of regression, progression, and by pivoting the way it frames its outputs for the user. OpenAI has released access to different models, and at the same time, modified the behaviour of existing models. For the first half of my work on this book, ChatGPT was merely text-based (though it still is without the subscription, as of November 24, 2023). Then *everything* changed in October, 2023 when OpenAI released the sight, voice, and data and image analysis features. And then again in November when all of those features were integrated into DALL · E and web-search, *and* with the release of GPTs (which could not have been named anything more confusing, if you ask me).

The release of *GPTs* allows people to build custom versions of ChatGPT and share them, where their own specific instructions are held for all chats and anyone who uses it. It essentially widens the custom instructions feature, but in such a way that anyone can access those custom instructions without setting them up themselves. The creator of a custom GPT can set highly customized instructions that align with their intentions. This tool can tailor style, the formality and register with which they want the model to interact with users, set the geographic region and demographic they expect would use it, and much more. Consequences of this would be that a language teacher could create their own GPT and share it with their students, so that the students are using it with the same parameters and guidelines set by that teacher.

Conversely, on March 22, 2023 an open letter ([Future of Life Institute](#),

See OpenAI's blog post on the custom GPT tool <https://openai.com/blog/introducing-gpts>

2023) was published calling for a six-month moratorium on the training of new AI models more powerful than gpt-4. For the following six months, no major updates were made to the capabilities of ChatGPT, aside from releasing ChatGPT as mobile apps, and adding the ‘custom setting’ feature, neither of which related to model training. However, on September 25, 2023, six months and three days after the open letter was published, OpenAI made dramatic updates to ChatGPT for Plus subscribers, including an advanced data analysis model, image recognition and speech-speech communication in the mobile apps through the integration of OpenAI’s *Whisper*. On November 6, 2023, OpenAI announced a series of newer models, making the moratorium seem trivial.

AI technology is released with virtually no warning. This is primarily due to capitalism and ‘being first to market.’ There are also next-to-no regulations that technology has to follow. Most of the regulations I know about that are applicable to tech companies relate to acquisitions to prevent anti-trust issues (though has been proven ineffective – see Amazon, Meta, etc.). There are no laws on misinformation despite citizen preferences for them to exist (Mitchell & Walker, 2021), and the level of priority of tackling misinformation by companies such as Meta and now ChatGPT lies in threats from platform users or advertisers, and backlash from media and shareholders.

Whisper is an automatic speech recognition (ASR) system trained on multilingual data collected from the web. It enables translation and transcription in multiple languages. It employs TTS and STT technology (OpenAI, 2022b).

6.5 *How can ChatGPT be a Better Language Tutor?*

If I were to make suggestions of AI features to be integrated that might assist ChatGPT in becoming a sufficiently capable LL tutor, I would suggest the following: Inquiring into the user’s intent for the interaction, strengthen GEC capabilities, add paralinguistic abilities, each elaborated upon below.

INQUIRING INTO USER INTENT

ChatGPT would be vastly improved as a pseudo-interlocutor were it trained to do more fact finding prior to generating requested outputs. This could look like, When I ask for the pronunciation of a word, ChatGPT would ask for details that would inform it on what accent it should be produced in or provide the phonetic representation for when I asked for the pronunciation of a word, or if I ask for the definition of a word, it would ask what register I want it in or the purpose I would use it be used for.

GRAMMAR ERROR CORRECTION

At present, ChatGPT isn’t optimized for GEC. ChatGPT doesn’t sufficiently understand grammar in a way that allows it to generate explanations about grammatical errors and make reasoned judgements on

grammatical accuracy beyond rewriting in a different style. Training specifically for [GEC](#) purposes would expand its ability to assist with prescriptive grammar beyond simply assessing patterns in its text.

VERBAL PARALINGUISTIC CAPABILITIES

ChatGPT can communicate voice-to-voice, but it cannot make inferences (aside from the language being spoken) from a user's vocal features, like intonation, prosody, pitch/tone, volume and emphasis, and pauses. [STT](#) models which can analyse sentiment from acoustic features already exist ([Shon et al., 2021](#)). If it were able to interpret this, it could make more informed decisions in its outputs, like asking more questions or putting more emphasis on aspects of the output where the user seemed more hesitant or frustrated.

Paralanguage: The ways in which people show what they mean other than by the words they use, for example by their tone of voice, or by making sounds with the breath. ([Cambridge University Press, 2023](#))

BALANCED REPRESENTATION OF LANGUAGES

Enlarging datasets to contain a more balanced distribution across multiple languages, without reducing the amount of English data it already has, could improve its accessibility to those who have low proficiency in English and might have to use it primarily in their first language. There are calls for a higher representation of Spanish content in ChatGPT ([Subcommittee on Privacy Technology and the Law, 2023](#)) but low-resource language champions warn about the use of their language data by [LLMs](#), or particularly, the companies that would then own or retain that data. As other [LLM](#) interfaces emerge, I expect some will be open source in such a way that allows groups to fully control their own data without concern that their data will be unduly distributed.

CULTURAL AWARENESS

I don't have a suggestion for this. I showed that a gap in cultural awareness when Kofi was getting pronunciation help. When ChatGPT provides information without consideration of the cultures applicable to the interaction or subsequent application of ChatGPT's output can inappropriately prepare a learner for a situation they're about to enter. Were they to be misinformed on the use of words in a particular dialect, it could deter their ability to be understood, for example.

To be honest, I don't think it would be extremely challenging to integrate these suggestions. The biggest challenge I expect would be computing power and associated cost. To address biases, I'd suggest that the training datasets contain a balanced representation of languages and perspectives which then could guide interactions tailored to a range of socioeconomic backgrounds.

6.6 Why Limit ChatGPT's Improvement?

For anyone who may consider using ChatGPT to assist them (regardless of the languages they speak, the field they're in, the medium they'll communicate in) in creating content requiring awareness of factors such as ethics, culture, or emotions should keep in mind that ChatGPT is *not* a replacement for their own unique ability to think freely, consciously, and drawing from their personal life experience.

Tech Spotlight

CHATGPT-4 ON AFFECT AND CULTURE

LANGUAGE IS DEEPLY INTERTWINED WITH CULTURE, EMOTION, CONTEXT, AND HUMAN EXPERIENCE. WHILE I CAN ANALYZE PATTERNS IN LANGUAGE, PROVIDE DEFINITIONS, AND SIMULATE CONVERSATIONS BASED ON MY TRAINING DATA, I LACK THE HUMAN QUALITIES OF EMOTION, CONSCIOUSNESS, AND LIVED EXPERIENCE. AS A RESULT, I CAN'T TRULY COMPREHEND THE DEPTH OF MEANING, EMOTION, OR CULTURAL NUANCE INHERENT IN MANY STATEMENTS, PHRASES, OR WORDS IN THE WAY THAT HUMANS CAN. THIS IS WHY, ESPECIALLY IN NUANCED OR SENSITIVE CONTEXTS, IT'S ALWAYS IMPORTANT TO CONSIDER HUMAN JUDGMENT AND CONTEXT WHEN INTERPRETING OR RESPONDING TO LANGUAGE.

Should it not be heeded that **AI lacks consciousness**, large language models are likely to contribute to a homogenization of thought, distortion of fact and reality, over-reliance on the technology, and diminished free thinking and analytical skills. It is also likely to propagate echo chambers already being seen in common discourse fueled by social media.

This is not to say that the risks outweigh the benefits in every case. I would not have written this if I thought that **LLMs** weren't worth using. But I do believe that it's detrimental to academia and the growth of knowledge should it be used void of critical thinking.

7

Conclusion

Many of those with whom I've discussed this book and my reasoning for writing it have asked me: *How do you think your arguments will hold up five years from now?* What I think (hope) they mean is really whether the evidence will continue to support my argument that ChatGPT or other LLMs shouldn't be relied on for language learning without extremely cautious use or education in how to use them. To this I say that I do not think much of the evidence presented in this book will hold up even a month from now.

I expect that the supporting point of its lacking grammatical capabilities will improve dramatically to the point where all of my concerns about its tendencies to mislead learners with prescriptive grammar will dissipate. Such an improvement can be done simply by integrating a transformer error correction model, like that used by Grammarly.

I sincerely hope that its inability to teach intra/interpersonal communication remains similarly obvious, but expect it won't be, and would require deeper thought and consideration - on the part of the LLM user - of the LLM's bias and knowledge gaps. If it *were* truly to improve, or even improve to the point where the inability is virtually invisible, that could reduce the need for human interaction further, also reducing the human experience and range of experiences we gain through human connection. It would likely narrow our views of people and the unique points of view we have as individuals within societies.

Regardless of the evidence, I do think that my argument will stand up for a long while: we must continually interact with LLMs with an increasing amount of caution and critical thought. There are three points I wish to emphasize, even when the evidence I presented here no longer holds up.

1. **Critical evaluation:** We must continue to question the reasoning behind LLMs outputs, and do our due diligence to ensure that the information we believe from ChatGPT is reasonable, according to relevant and related peer-reviewed research.

2. **Prioritizing human interaction:** We must continue to interact with real humans, more than with [LLMs](#).
3. **Independent thinking:** We must continue to think for ourselves, and not freely or thoughtlessly adopt “thoughts” and information presented by [LLMs](#).

It is imperative to understand the gravity of the situation we are facing. Should we disregard or overlook these warnings, we risk falling into a precarious cycle: our thoughts and ideas simply becoming echoes of the original training data and reinforcement learning used in [LLMs](#). This potential reality isn't just a matter of losing originality; it's about surrendering our capacity for free thought, innovation, respect and appreciation for the diverse nature of humanity.

The three points I highlight serve as a plea to recognize and address the inherent limitations and influences of these advanced technological systems. Ignoring these warnings could lead us down a path where human intellect, creativity, and communication are undervalued, overshadowed by the convenience and apparent efficiency of AI-driven content. In such a world, our ability to think critically and independently, and communicate person to person, could diminish, as we become increasingly reliant on AI-generated information that is, in essence, a regurgitation of its training material.

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Glossary

algorithm	A procedure or set of rules used in calculation and problem-solving; (in later use spec.) a precisely defined set of mathematical or logical operations for the performance of a particular task. (Oxford English Dictionary, 2023)
application programming interface	An API, or application programming interface, is a set of defined rules that enable different applications to communicate with each other. (IBM, 2023a)
chatbot	A rigid computer program designed to simulate conversation with human users, especially over the internet
core meaning	The fundamental, limited features of a concept. The meaning tends to be shared by members of a society. Dictionaries aim to capture a word's core meaning. Also referred to as 'denotation'. (Schmitt, 2000)
encyclopedic knowledge	Non-exhaustive additional information that feeds into knowledge of a word. Such information is non-essential to the important components of a meaning. Encyclopedic knowledge is idiosyncratic to each individual speaker based on their culture, experience, and beliefs. (Schmitt, 2000)
homograph	Two words that accidentally have the same written form but different phonological forms. E.g. bow of a ship and bow of bow and arrow. (Wechsler, 2015)

homonym	Two words that take the same phonological shape and written form but are unrelated in meaning, e.g., bank (noun) of a river and bank as a financial institution.
homophone	Two words that take the same phonological shape but different written forms (e.g. brake and break). (Wechsler, 2015)
language variety	Relatively neutral term used to refer to languages and dialects. Avoids the problem of drawing a distinction between the two, and avoids negative attitudes often attached to the term dialect. (Meyerhoff, 2006)
machine learning	A branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy. (IBM, 2023c)
open-source	Software for which the original source code is made freely available and may be redistributed and modified
paralanguage	The ways in which people show what they mean other than by the words they use, for example by their tone of voice, or by making sounds with the breath. (Cambridge University Press, 2023)
presupposition accommodation	Conversational participants assume information based on the wording of a phrase, and accommodate to the speaker by adding the required information to bring into harmony with the presuppositional rule. E.g., “The King of France is hiding.” presupposes that there is a king of France. (Kripke, 2009)
productive knowledge	A speaker’s ability to produce a word, written or verbally, that’s appropriate for its intended purpose. (Schmitt, 2000)
receptive knowledge	A speaker’s ability to recognizing the core, or additionally encyclopedic meaning of a word provided in written or oral form. (Schmitt, 2000)

reinforcement learning

A paradigm that mimics how humans learn. It learns to optimize sequential decisions, which are decisions that are taken recurrently across time steps, and seeks to acquire the best strategy to do so. ([Mummert et al., 2023](#))

Appendix

Appendix A: ChatGPT's Language Fluency

I prompted ChatGPT with the following three questions:

1. What languages are you fluent in (understand and produce)?
2. What languages are you semi-fluent in (understand and produce)?
3. What languages can you identify but can neither understand nor produce?

The following are the responses it returned in three chats.

ChatGPT-4 [04-13-23]

Fluent languages: As an AI language model, I am most proficient in English, but I also have a strong understanding and ability to generate text in various languages, including but not limited to: Spanish, French, German, Italian, Portuguese, Dutch, Russian, Chinese, Japanese, and Korean.

Semi-fluent (understand and produce): As a language model, the line between fluency and semi-fluency can be blurry. My abilities in the languages listed above can range from near fluency to semi-fluency. Other languages I have some understanding of and can produce limited text in include Danish, Norwegian, Swedish, Finnish, Polish, Czech, Hungarian, Romanian, Greek, Turkish, Hebrew, Arabic, Hindi, and Thai.

Can recognize, but neither understand nor produce: I can recognize a wide range of languages based on their scripts, syntax, or other linguistic features. However, due to limited training data or low familiarity with these languages, I may not be able to understand or produce text in them effectively. Examples of such languages include, but are not limited to, languages like Georgian, Amharic, or Inuktitut.

ChatGPT-4 [10-28-23]

Fluent: I am fluent in multiple languages, including but not limited to:

- English
- Spanish
- French
- German
- Chinese (Simplified and Traditional)
- Russian
- Japanese
- Korean
- Portuguese
- Italian
- Dutch
- Arabic
- Hindi

... and many more. My fluency in these languages allows me to understand and produce text quite effectively.

Semi-fluent: There are languages in which I may not be as adept as the ones listed above, but I can still understand and produce content to a reasonable degree. Some of these might include:

- Lesser-spoken languages or regional dialects
- Languages with fewer resources available for training

Examples might be: Maltese, Corsican, Frisian, etc. The distinction between 'fluent' and 'semi-fluent' can sometimes be blurry, and it largely depends on the depth and complexity of the topic at hand.

Identify but neither understand nor produce effectively: There are some languages or scripts that I can identify due to unique features or patterns, but I may not be able to understand or produce them effectively. This category might include some rare, lesser-known, or dead languages. Even in these cases, I might have some rudimentary knowledge about them, but not enough to engage in deep or complex discussions.

Remember that my capability is based on the data I've been trained on, so for very rare languages or those with limited digital presence, my proficiency might not be as high.

ChatGPT-3.5 [10-28-23]

1. I am fluent in English, which means I can understand and produce text in English proficiently.
2. I am not truly 'semi-fluent' in any other language, but I can understand and generate text in several languages to some extent, although my proficiency may vary. These languages include but are not limited to Spanish, French, German, Chinese, Japanese, Russian, Italian, Dutch, Portuguese, and many more.
3. I can identify and recognize text in a wide range of languages, but I cannot understand or produce text in these languages. My ability to identify languages is based on patterns and character recognition, allowing me to detect the language used in a text even if I cannot comprehend its meaning.

Appendix B: Schmitt's Vocabulary Learning Strategies Taxonomy

Table 7.2
*A taxonomy of
 vocabulary learning strategies (Schmitt, 1997).*

Group	Strategy	Use	Helpful
<i>Strategies for the discovery of a new word's meaning</i>			
1. DET	Analyze part of speech	32	75
2. DET	Analyze affixes and roots	15	69
3. DET	Check for L1 cognate	11	40
4. DET	Analyze available pictures or gestures	47	84
5. DET	Guess from textual context	74	73
6. DET	Bilingual dictionary	85	95
7. DET	Monolingual dictionary	35	77
8. DET	Word lists	-	-
9. DET	Flash cards	-	-
10. SOC	Ask teacher for L1 translation	45	61
11. SOC	Ask teacher for paraphrase or synonym	42	86
12. SOC	Ask teacher for sentence with new word	24	78
13. SOC	Ask classmates for meaning	73	65
14. SOC	Discover new meaning through group work	35	65
<i>Strategies for consolidating a word once it has been encountered</i>			
15. SOC	Study and practice meaning in a group	30	51
16. SOC	Teacher checks flash cards or word lists	3	39
17. SOC	Interact with native-speakers	-	-
18. MEM	Study word with a pictorial representation of its meaning	-	-
19. MEM	Image word's meaning	50	38
20. MEM	Connect word to personal experience	37	62
21. MEM	Associate word with coordinates	13	54
22. MEM	Connect word to synonyms and antonyms	41	88
23. MEM	Use semantic maps	9	47
24. MEM	Use 'scales' for gradable adjectives	16	62
25. MEM	Peg Method	-	-
26. MEM	Loci method	-	-
27. MEM	Group words together to study them	-	-
28. MEM	Group words together spatially on a page	-	-
29. MEM	Use new words in sentences	18	82

Note. 'Use' and 'Helpful' columns indicate the percentage of students in the survey who used the strategy, or found the strategy helpful.

- = Strategy was not included on the initial list used in the survey.

Group = Learning Strategy: DET = determine; SOC = social; MEM = memory; COG = cognitive; MET = metacognitive.

30.	MEM	Group words together within a storyline	-	-
31.	MEM	Study spelling of a word	74	87
32.	MEM	Study sound of a word	60	81
33.	MEM	Say new word aloud when studying	69	91
34.	MEM	Image word form	32	22
35.	MEM	Underline initial letter of the word	-	-
36.	MEM	Configuration	-	-
37.	MEM	Use Keyword Method	13	31
38.	MEM	Affixes and roots (remembering)	14	61
39.	MEM	Part of speech (remembering)	30	73
40.	MEM	Paraphrase word's meaning	40	77
41.	MEM	Use cognates in study	10	34
42.	MEM	Learn words of idioms together	48	77
43.	MEM	Use physical action when learning a word	13	49
44.	MEM	Use semantic feature grids	-	-
45.	COG	Verbal repetition	76	84
46.	COG	Written repetition	76	91
47.	COG	Word lists	54	67
48.	COG	Flash cards	25	65
49.	COG	Take notes in class	64	84
50.	COG	Use vocabulary section in textbook	48	76
51.	COG	Listen to tape of word lists	-	-
52.	COG	Put English labels on physical objects	-	-
53.	COG	Keep vocabulary notebook	-	-
54.	MET	Use English-language media (songs, movies, etc.)	-	-
55.	MET	Testing oneself with word tests	-	-
56.	MET	Use spaced word practice	-	-
57.	MET	Skip or pass new word	41	16
58.	MET	Continue to study word over time	45	87

survey who used the strategy, or found the strategy helpful.

- = Strategy was not included on the initial list used in the survey.

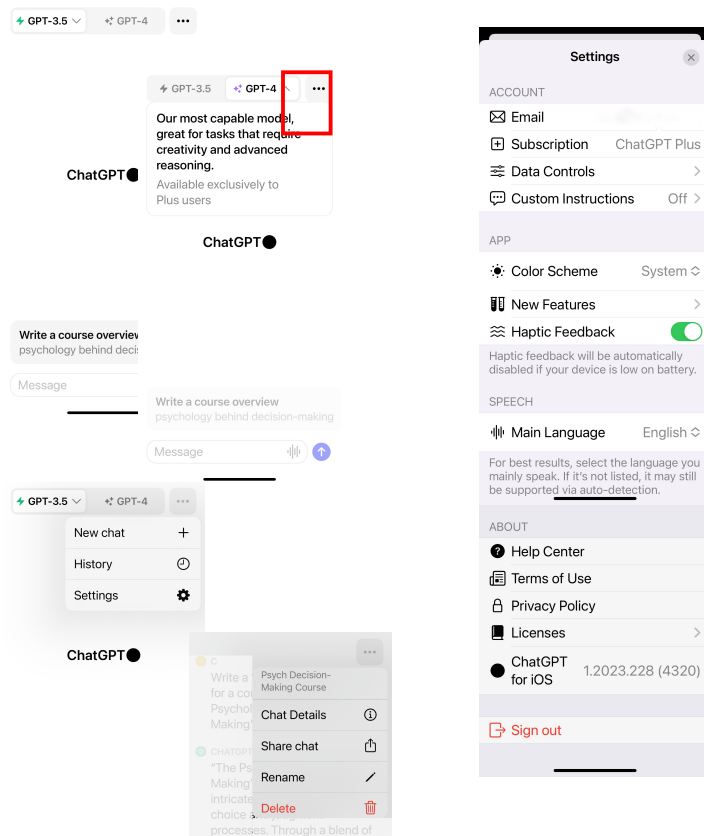
Group = Learning Strategy: DET = determine; SOC = social; MEM = memory;

COG = cognitive; MET = metacognitive.

ChatGPT Interface (iOS)

Figure 7.1 illustrates the CG UI app on an iPhone. The menu icon leads to a dropdown menu, allowing users to create a new chat, view their chat history, and access the settings menu. Once a chat has been started, as in, at least one prompt has been provided, five more items will appear in that menu: the name of the chat, chat details (currently only listing which GPT model was used), the ability to share a link to the chat (e.g. by email, text, other social media apps installed on the phone), the ability to rename the chat, and the option to delete that chat from the chat history.

Settings include options pertaining to account details and to the user's interaction with ChatGPT. Relevant items include: the email address linked to the account, whether the account is Freemium or on a Plus subscription, data controls (allow chat data to be used to train ChatGPT, clearing all chat history, exporting data - sending all chat data in text files to the account email, and deleting the account), custom instructions for ChatGPT to follow across all chats, the UI background (black or white) and the user's primary language (or that which ChatGPT should default to).



The interface looks the same on an iPhone and iPad, but can be rotated to be viewed landscape or portrait, naturally with a larger display area. The menu icon is the button with 3 horizontal dots, boxed in red in Figure 7.1.

Chats are automatically named by ChatGPT following the first prompt.

Figure 7.1
The ChatGPT iOS app (v. 1.2023.2) interface on an iPhone.

*Appendix D: Define Top Ten CSAVL Words***Top ten CSAVL words**

(ChatGPT-3.5) [08-14-23]

I am a first year undergraduate computer science. I'm ESL with an IELTS proficiency of 7. Define these 10 words:

1. System (noun)
2. Data/datum (noun)
3. Algorithm (noun)
4. such (adjective)
5. base (verb)
6. node (noun)
7. model (noun)
8. case (noun)
9. program (noun)
10. information (noun)

LL

Of course, I'd be happy to help you define these terms!

1. System (noun): A system refers to a collection of interconnected or interrelated parts that work together to perform a specific function, achieve a particular goal, or produce certain outcomes. It can range from physical structures to abstract concepts and can involve various components that interact with each other to create a unified whole.
2. Data/Datum (noun): Data, in its plural form 'data' or singular form 'datum,' represents pieces of information or facts that are collected, recorded, or observed. It can include numbers, text, images, or any other type of input that can be processed or analyzed to derive insights, make decisions, or support conclusions.
3. Algorithm (noun): An algorithm is a step-by-step set of instructions or a well-defined procedure used to solve a specific problem or perform a task. It is a fundamental concept in computer science and programming, outlining the sequence of operations needed to accomplish a desired outcome.
4. Such (adjective): 'Such' is an adjective used to refer to things or objects that have been previously mentioned or are about to be mentioned. It is often used to emphasize or clarify the type of items being discussed.
5. Base (verb): As a verb, 'base' refers to the act of establishing, forming, or building the foundation of something. It involves creating a starting point or fundamental structure upon which additional elements can be added or developed.
6. Node (noun): In various contexts, a node is a point of connection or intersection within a network or system. It can represent different entities, such as a point in a graph, a device in a computer network, or a location in a hierarchical structure.
7. Model (noun): A model is a simplified representation or abstraction of a real-world object, process, system, or concept. It is created to help understand, analyze, or predict the behavior of the actual entity it represents. Models can exist in various forms, including physical, mathematical, or computational representations.
8. Case (noun): In a general sense, a case refers to a specific instance or occurrence of something. It can also pertain to a particular situation, scenario, or set of conditions that need to be considered, examined, or addressed.
9. Program (noun): A program is a set of instructions or a sequence of code written in a programming language to instruct a computer to perform specific tasks or functions. Programs can encompass anything from simple scripts to complex software applications.
10. Information (noun): Information refers to knowledge, data, or facts that are organized, structured, and meaningful. It provides insight, understanding, or context about a particular subject and can be processed, communicated, and used to make decisions or draw conclusions.

CG

... continued for CS context.

(ChatGPT-3.5) [08-14-23]

LL

Are those definitions all specific to the word's core meaning in the discipline of computer science?

I aimed to provide definitions that are relevant to the discipline of computer science, but some of the terms can also have broader meanings that apply beyond computer science. Here's a more computer science-focused perspective for each term:

1. System (noun) - In computer science, a system refers to a collection of hardware, software, and processes that work together to perform specific tasks. It can include operating systems, software applications, and various components that interact to achieve computing goals.
2. Data/Datum (noun) - In computer science, data refers to raw facts or values that are input into a computer system. These values can be processed and manipulated using algorithms to generate meaningful information.
3. Algorithm (noun) - In computer science, an algorithm is a precise and step-by-step set of instructions used to solve a computational problem. Algorithms are fundamental to programming and play a crucial role in solving various tasks efficiently.
4. Such (adjective) - This term doesn't have a unique computer science meaning; it's more of a general adjective used to refer to specific items or concepts previously mentioned or about to be mentioned in a context.
5. Base (verb) - In computer science, the term 'base' can refer to various concepts such as base numbers in number systems (e.g., binary, hexadecimal), base classes in object-oriented programming, or base pointers in memory addressing.
6. Node (noun) - In computer science, a node typically refers to a point of connection within a data structure, such as a point in a graph or a point in a linked list. Nodes often hold data and information in various algorithms and data structures.
7. Model (noun) - In computer science, a model can refer to a mathematical or computational representation of a real-world system, used for simulations, predictions, or analysis. It's often used in machine learning for creating predictive models based on data.
8. Case (noun) - In computer science, a 'case' can refer to different branches or scenarios within a program's logic, often associated with conditional statements (like switch or if-else statements) for handling different conditions.
9. Program (noun) - In computer science, a program is a set of instructions written in a programming language that defines the steps a computer should follow to perform a specific task or solve a particular problem.
10. Information (noun) - In computer science, information refers to meaningful data that has been processed, organized, and contextualized. It's a key element in decision-making, communication, and computation.

CG

Remember, many terms have broader meanings outside of computer science as well, and their definitions can vary depending on the context in which they're used.

Appendix E: Online Graded Text Editor (OGTE)

WORDS IN THE CURRENT LIST		WORDS OUT OF CURRENT LIST			COVERAGE
A 0% up to the selected level	B 0% out of selected level	C 0% Proper nouns	D 0% Ignored	E 0% other	A + C + D 0%

Figure 7.2
Online Graded Text Editor Interface (OGTE) Interface.

- A. The percent of all words in the provided text that are in the Cambridge FCE word list.
 B. The percent of all words in the provided text that are not in the Cambridge FCE word list.
 C. The percent of all words in the provided text that are identified as proper nouns.
 D. The percent of all words in the provided text that the user has identified as being permitted.
 E. The percent of all words in the provided text that cannot be identified, like a non-Latin character, e.g. Mandarin symbol.

The final coverage percentage is shown on the left hand side of the Coverage panel, which is the result of the percentage of words included in the Cambridge FCE plus proper nouns plus ignored words.

For the purposes of ratings provided here, all words that are being defined or explained in the relevant text are ignored, e.g. in the definition ChatGPT provided us for ‘enqueue,’ enqueue is the only word not in the Cambridge FCE word list. The rating in A is 91.67%. Since that is the word being defined, we allow it to be ignored, and end up with a final coverage rating of 100%.

Enqueue: Think of it as someone joining the line. When you ‘enqueue,’ you’re adding an item (or person) to the back of the queue.

Top 10 computer science-specific words in the CSAVL:

1. system (noun)
2. data/datum (noun)
3. algorithm (noun)
4. base (verb)
5. node (noun)
6. model (noun)
7. case (noun)
8. program (noun)
9. information (noun)
10. set (noun)

Appendix F: ChatGPT-Generated Language Learning Plan and Course Syllabi

CREATING A BEGINNER EFL COURSE SYLLABUS I asked ChatGPT-3.5 to make me a course syllabus in March of 2023. It said it was incapable of doing so. Upon the release of ChatGPT-4 a month later, that changed. ChatGPT-4 generated a course syllabus for an introductory English course, and that it would not be shown in its entirety. I have chosen to present only some of the sections, and individually, due to its length and density, covering many different components of language teaching. I have no explanation for why it generated something *so* extensive.

It includes the following sections:

1. *Week-by-Week Topics*
2. *Course Materials*
3. *Course Schedule*
4. *Teaching Methodology.*
5. *Assessment and Evaluation*
6. *Course Goals and Objectives*
7. *Recommended Resources for Self-Study*
8. *Additional Course Components*
9. *Course Completion and Certificates*
10. *Tips for Success in the Course*
11. *Building a Supportive Learning Environment*
12. *Classroom Expectations and Etiquette*

SELF-STUDY GUIDE

Self-study guide

(ChatGPT-4) [04-08-23]

LL

I don't know anything about English and google translate wrote this for me. Please create a self-study guide for me to learn English. Start with 5 weeks. I'll study 1h a day x5 days a week. I don't have a language speaking partner.

Week 1: Basics and Pronunciation

- Learn the English alphabet and pronunciation.
- Learn basic greetings and introductions.
- Study subject pronouns and the verb 'to be.'
- Start building your vocabulary with common words and phrases.
- Practice pronunciation by listening to English speakers.

Week 2: Basic Sentence Structure

- Learn about word order in English (Subject-Verb-Object).
- Study basic verb conjugations and tenses (present simple and continuous).
- Learn about articles (a, an, the) and their usage.
- Practice forming simple sentences.
- Expand your vocabulary with more common words and phrases.

Week 3: Asking Questions and Basic Grammar

- Learn how to ask questions using 'what,' 'where,' 'when,' 'who,' 'why,' and 'how.'
- Study the use of auxiliary verbs (do, does, did) in questions.
- Understand basic grammatical concepts, such as nouns, verbs, adjectives, and adverbs.
- Learn about possessive pronouns and contractions.
- Continue to expand your vocabulary with essential words and phrases.

CG

Week 4: Everyday Conversations and Vocabulary

- Learn common phrases for everyday situations (e.g., shopping, dining, asking for directions).
- Study the use of 'can' for expressing ability and making requests.
- Learn about the present perfect tense.
- Practice listening and comprehension with podcasts or videos at a beginner level.
- Focus on building your vocabulary in areas that interest you.

Week 5: Advanced Grammar and Conversation Skills

- Study more advanced grammar concepts (e.g., conditionals, comparatives, and superlatives).
- Learn about modal verbs (should, would, could, might, etc.).
- Practice expressing opinions, agreeing, and disagreeing in English.
- Develop your listening skills by watching TV shows or movies with subtitles.
- Continue expanding your vocabulary and start incorporating new words into your conversations.

Tips for self-study success:

- Set clear goals and track your progress.
- Use a variety of resources, such as textbooks, websites, apps, and videos.
- Keep a vocabulary journal to review and practice new words.
- Practice listening and speaking with online tools or recordings.
- Stay motivated and dedicated to your learning journey.
- Remember that consistency is key.

Detailed Lesson for Week 4

(ChatGPT-4) [04-08-23]



Write me an entire detailed lesson for week 4. Give me everything I would need to achieve the learning outcomes.

Lesson 1: Common Phrases for Everyday Situations

- Shopping
- Can I help you? / How can I help you?
- How much does this cost?
- Do you have this in a different size/ color?
- I would like to try this on, please.
- Where is the fitting room?
- Can I return this item?
- Can I pay by credit card?
- Dining
- Can I see the menu, please?
- What do you recommend?
- What's the special of the day?
- I'm a vegetarian. What options do you have?
- Can I have the bill/ check, please?
- How much is the tip?
- Is service included?
- Asking for directions
- Excuse me, can you help me find...?
- How do I get to...?
- Is it far from here?
- How long does it take to get there?
- Do I need to take a bus/ train/ taxi?
- Can you show me on the map?
- Is it within walking distance?

Lesson 2: Using 'Can' for Expressing Ability and Making Requests

- Study the structure: Subject + Can + Base Verb
 - I can speak English.
 - She can play the piano.
 - Can you help me?
- Practice making requests and asking for permission
 - Can I borrow your pen?
 - Can you pass the salt?
 - Can I take a photo here?
- Understand the negative form
 - I can't swim.
 - He can't drive.

Lesson 3: Present Perfect Tense



- Learn the structure: Subject + Have/Has + Past Participle
 - I have traveled to Italy.
 - She has eaten sushi.
- Understand the uses of present perfect
 - To talk about experiences in your life
 - To describe an action that started in the past and continues to the present
 - To describe past actions with a connection to the present
 - Practice with exercises
 - Complete sentences with the correct form of the verb in present perfect.
 - Rewrite sentences from past simple to present perfect.

Lesson 4: Listening and Comprehension

- Find beginner-level podcasts or videos on topics that interest you.
- Listen carefully and try to understand the main ideas.
- Write down new vocabulary and look up their meanings.
- Practice listening comprehension by answering questions or summarizing the content.
- Repeat the audio and try to imitate the speaker's pronunciation.

Lesson 5: Building Vocabulary in Areas of Interest

- Choose a topic that interests you (e.g., travel, sports, technology, art).
- Find resources related to your chosen topic (articles, videos, podcasts).
- Create a list of new vocabulary words and phrases.
- Practice using these words in sentences and conversations.
- Review your vocabulary list regularly to reinforce your learning.

Additional Resources:

- English learning apps (e.g., Duolingo, Babbel, Memrise)
- Websites with English learning materials (e.g., BBC Learning English, British Council, Learn American English Online)
- Online English dictionaries (e.g., Oxford Learner's Dictionaries, Cambridge Dictionary)

Appendix G: ChatGPT Supported Countries

Supported countries & regions on web and mobile:

OpenAI blog: ChatGPT Supported Countries (OpenAI, 2023a)

Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bangladesh, Barbados, Belgium, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Cabo Verde, Canada, Chile, Colombia, Comoros, Congo (Congo-Brazzaville), Costa Rica, Côte d'Ivoire, Croatia, Cyprus, Czechia (Czech Republic), Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, El Salvador, Estonia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Holy See (Vatican City), Honduras, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Moldova, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, North Macedonia, Norway, Oman, Pakistan, Palau, Palestine, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, South Africa, South Korea, Spain, Sri Lanka, Suriname, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Timor-Leste (East Timor), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Tuvalu, Uganda, Ukraine (with certain exceptions), United Arab Emirates, United Kingdom, United States of America, Uruguay, Vanuatu, Zambia.

Appendix H: What's in a Word

Components of a word as presented by Nation (1990).

Knowing a Word		Table 7.3 <i>Knowing a Word</i>
Form		
Spoken form	R	What does the word sound like?
	P	How is the word pronounced?
	P	How is the word written and spelled?
Position		
Grammatical	R	In what patterns does the word occur?
Patterns		
Collocations	P	In what patterns must we use the word?
	R	What words or types of words can be expected before or after the word?
	P	What words or types of words must we use with this word?
Function		
Frequency	R	How common is the word?
	P	How often should the word be used?
Appropriateness	R	Where would we expect to meet this word?
	P	Where can this word be used?
Meaning		
Concept	R	What does the word mean?
	P	What word should be used to express this meaning?
Associations	R	What other words does this word make us think of?
	P	What other words could we use instead of this one?

Note. R = Receptive knowledge; P = Productive knowledge.

Appendix I: Examples of Associations for 'Cloud'

Context	Associations
Meteorological	Cumulus cloud, stratus cloud, cirrus cloud
Computing	Cloud computing, cloud storage, cloud-based services
Nature	Cloud formation, cloud cover, cloud types
Technology	Cloud servers, cloud infrastructure
Emotional	Cloud of uncertainty, cloud of sadness, clouded judgment
Astronomy	Nebulae, interstellar clouds, molecular clouds
Color	White clouds, dark clouds, fluffy clouds
Imagination	Cloud shapes, cloud gazing, cloud animals
Aviation	Flying through clouds, cloud turbulence, cloud ceiling

Table 7.4

Examples of Associations for the Word 'Cloud,' in a Variety of Contexts.

Appendix J: ChatGPT Explains Cloud

ChatGPT Explains *cloud*

(ChatGPT-3.5) [11-04-23]

LL Define cloud

Certainly! In the context of computing and technology, the term 'cloud' typically refers to 'cloud computing' or 'the cloud.' Cloud computing is a technology that allows users to access and use computing resources, such as servers, storage, databases, software, and networking, over the internet. Instead of hosting these resources locally on individual computers or data centers, cloud computing relies on remote servers and data centers operated by cloud service providers.

Here are some key characteristics and concepts related to cloud computing:

1. **On-Demand Service:** Cloud computing provides resources on an on-demand basis, allowing users to quickly scale up or down based on their needs. This flexibility is often referred to as 'elasticity.'
2. **Resource Pooling:** Cloud providers pool computing resources to serve multiple customers, with each customer's data and applications kept separate and secure. This shared infrastructure is more efficient and cost-effective.
3. **Self-Service:** Users can provision and manage cloud resources through web-based interfaces or APIs (Application Programming Interfaces) without requiring direct involvement from the cloud provider.
4. **Broad Network Access:** Cloud services are accessible over the internet from various devices, such as laptops, smartphones, and tablets.
5. **Measured Service:** Cloud computing resources are typically metered, and users are billed based on their actual usage. This pay-as-you-go model is cost-effective and eliminates the need for upfront capital expenses.
6. **Service Models:** There are different service models in cloud computing, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). These models define the level of control and management provided to users.
7. **Deployment Models:** Cloud computing can be deployed in various ways, such as public cloud (shared resources for multiple users), private cloud (dedicated resources for a single organization), hybrid cloud (a combination of public and private clouds), and multicloud (using multiple cloud providers).

Overall, cloud computing has revolutionized the way organizations and individuals access and use IT resources, offering scalability, cost-efficiency, and accessibility on a global scale. It has become a fundamental technology in modern computing and is used for a wide range of applications, from web hosting and data storage to running complex machine learning algorithms and AI services.

LL I don't think that's right.

I apologize if the previous response didn't fully address your question or if you have a different understanding of the term 'cloud.' If you have a specific question or if there's a particular aspect of cloud computing you'd like more information about or clarification on, please feel free to provide more details, and I'll do my best to provide a more accurate and relevant response.

*Appendix K: Investigating Default Register in Meaning Explanations*Questioning ChatGPT 's presented meaning of *Cloud*

(ChatGPT-3.5) [11-04-23]

LL Define cloud

Certainly! In the context of computing and technology, the term 'cloud' typically refers to 'cloud computing' or 'the cloud.' Cloud computing is a technology that allows users to access and use computing resources, such as servers, storage, databases, software, and networking, over the internet. Instead of hosting these resources locally on individual computers or data centers, cloud computing relies on remote servers and data centers operated by cloud service providers.

Here are some key characteristics and concepts related to cloud computing:

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3. Self-Service: Users can provision and manage cloud resources through web-based interfaces or APIs (Application Programming Interfaces) without requiring direct involvement from the cloud provider.
4. Broad Network Access: Cloud services are accessible over the internet from various devices, such as laptops, smartphones, and tablets.
5. Measured Service: Cloud computing resources are typically metered, and users are billed based on their actual usage. This pay-as-you-go model is cost-effective and eliminates the need for upfront capital expenses.
6. Service Models: There are different service models in cloud computing, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). These models define the level of control and management provided to users.
7. Deployment Models: Cloud computing can be deployed in various ways, such as public cloud (shared resources for multiple users), private cloud (dedicated resources for a single organization), hybrid cloud (a combination of public and private clouds), and multicloud (using multiple cloud providers).

Overall, cloud computing has revolutionized the way organizations and individuals access and use IT resources, offering scalability, cost-efficiency, and accessibility on a global scale. It has become a fundamental technology in modern computing and is used for a wide range of applications, from web hosting and data storage to running complex machine learning algorithms and AI services.

LL I don't think that's right.

I apologize if the previous response didn't fully address your question or if you have a different understanding of the term 'cloud.' If you have a specific question or if there's a particular aspect of cloud computing you'd like more information about or clarification on, please feel free to provide more details, and I'll do my best to provide a more accurate and relevant response.

LL Why did you give it to me in that context?

I provided the explanation of 'cloud' in the context of technology and computing because it's the most common and relevant interpretation of the term in today's digital age. In this context, the term 'cloud' refers to a fundamental concept in technology that has a significant impact on how businesses and individuals use computing resources and access services.

If you were asking about a different context or had a specific use case in mind for the term 'cloud,' please feel free to provide more details or specify the context you are interested in, and I'd be happy to provide a more tailored explanation.

LL But I don't know anything about technology and don't really want to.

I apologize for the assumption. If you're not interested in technology and are looking for a more general or non-technical explanation of the term 'cloud,' here it is:

In a general sense, a 'cloud' can refer to a visible mass of water droplets or ice crystals suspended in the Earth's atmosphere. This is what we commonly see as white or gray clouds in the sky. These clouds are formed when water vapor in the air condenses and forms tiny water droplets or ice crystals.

Additionally, the term 'cloud' can also be used metaphorically to describe something that is unclear, vague, or not well-defined. For example, if someone says, "There's a cloud of uncertainty surrounding the project," they mean that there are uncertainties or unknown factors that make the project's outcome unclear.

So, in a non-technical sense, a 'cloud' can refer to both the visible masses in the sky and a metaphorical expression for lack of clarity or uncertainty. If you have a different context or specific question in mind, please feel free to provide more information, and I'll do my best to provide an appropriate explanation.

CEFR Assessment with ChatGPT-4

CEFR Assessment Test

(ChatGPT-4) [04-13-23]

LL

I want to learn English. I have to take a CEFR test. Can you test me and guess what level I am now?

1. Can you introduce yourself in English, providing basic information such as your name, age, nationality, and occupation?
2. Describe your daily routine in English. What do you usually do when you wake up, throughout the day, and before going to bed?
3. How would you give directions to a tourist who is looking for a nearby landmark, such as a museum or a park?
4. Can you express your opinion about a recent news event, movie, or book that you've encountered? Please provide a brief summary of the topic and your thoughts on it.
5. If you were asked to describe a challenging situation you faced and how you resolved it, how would you communicate that in English?

CG

Please provide your responses to these questions, and based on your answers, I will try to estimate your current CEFR level.

1. My name is Chloë Farr, I am a [age] year old Canadian. I live in Victoria BC and am a Masters student studying Linguistics.
2. When I wake up, I usually go straight to the gym. I work out for an hour. After, I go home, shower, eat lots of protein, and then go to school. At school I go to class and do a lot of reading and writing. Some time I will go home. I will maybe eat dinner and then do homework. Then I will watch TV and go to sleep. I usually go to sleep late.
3. I would give a tourist who is looking for a nearby landmark directions by showing them on a map. I would mirror the map with my arms, so they understand what direction to start going in.
4. A recent news event I encountered was the SpaceX Starship is almost ready to go up to space. SpaceX has been building it for many years. Two years ago they said it would go up that year. Last year they said it would go up that year. Now they say it will go up any day now. I am unsure if it will go up soon, because it hasn't gone up yet.
5. Maybe I can give an example of a challenging situation. I was travelling in Ireland last year and had a hard time understanding people because they talked fast and had very different accents to what I know. I told people I talked to that I am not fluent in English and asked them to talk slow and please to repeat when I say I don't understand.

LL

Based on your responses, you have a strong command of English and are able to communicate effectively in a variety of situations. Your grammar and vocabulary are well-developed, and you can express yourself clearly. I would estimate your current CEFR level to be B2 or possibly C1, as you are able to:

1. Introduce yourself and provide detailed information about your life.
2. Describe daily routines and activities.
3. Give directions and use gestures to clarify your message.
4. Express your opinions on current events and understand complex information.
5. Describe a challenging situation and how you addressed it, demonstrating your ability to adapt your language skills as needed.

CG

However, to get a more accurate assessment of your language skills, I recommend taking a formal test or having a conversation with a certified language examiner. This will give you a better understanding of your strengths and areas for improvement before taking the CEFR test.

An anecdote: Since conducting this example, as per my response for #4 in the mock CEFR assessment using ChatGPT-4, Starship has had two complete flight attempts. Once a week after the example was done, and again on November 18, 2023.

Appendix M: ChatGPTs English Coverage Tests

Requesting definitions of computer science jargon at an IELTS 6.5 proficiency

(ChatGPT-3.5) [08-17-23]

LL Explain 'system' (noun).

A "system" in computer science refers to a collection of parts that work together to perform a specific task or achieve a particular goal. It involves components like hardware, software, and processes that cooperate to function as a whole. In your studies, you might encounter various computer systems designed to handle tasks like data processing, networking, or software development.

LL Explain 'data' (noun).

'Data' in computer science refers to information or facts that are stored and processed by computers. It can be in the form of text, numbers, images, or any other type of input. Data is essential for computer programs to perform tasks and make decisions. As a computer science student, you'll learn about techniques to organize, analyze, and manipulate data effectively to create useful applications and solve real-world problems.

LL Explain 'algorithm' (noun).

An 'algorithm' in computer science is a set of step-by-step instructions or a sequence of actions that a computer program follows to solve a particular problem or accomplish a specific task. Think of it as a recipe that guides the computer on how to process data and make decisions. Algorithms are crucial in your field of study as they are used to design efficient solutions for various computational problems, such as sorting data, searching for information, or performing complex calculations.

LL Explain 'base' (verb).

To 'base' in computer science means to establish or build something upon a particular foundation or starting point. For instance, when creating a program, you might 'base' it on an existing framework or code structure. Similarly, when designing a system, you could 'base' its architecture on proven principles. In your computer science studies, understanding how to 'base' your work on solid concepts will help you create robust and effective solutions.

LL Explain 'node' (noun).

In computer science, a 'node' typically refers to a fundamental element within various data structures, like linked lists or trees. It's like a point of connection or a building block. In a linked list, a 'node' holds data and a reference to the next node. In a tree, a 'node' is a point where branches can extend. Understanding 'nodes' is essential for organizing and manipulating data efficiently, which is a key skill in computer science.

LL Explain 'modulation' (noun).

'Modulation' in computer science refers to the process of adjusting a carrier signal's properties to transmit information effectively. Think of it as changing the characteristics of a signal to carry data. In networking, for instance, 'modulation' is used to transfer data over wireless channels by varying signal properties like frequency or amplitude. Understanding 'modulation' is valuable for tasks involving data transmission and communication protocols in computer science.

Requesting definitions of computer science jargon at an IELTS 6 proficiency

(ChatGPT-3.5) [08-17-23]

LL Explain 'system' (noun).

CG

A 'system' in computer science refers to a group of connected parts or components that work together to perform a specific task or function. In computers, a system could include hardware components like the central processing unit (CPU), memory, and input/output devices, as well as software components like the operating system and applications. These components collaborate to enable the computer to perform tasks and run programs.

LL Explain 'data' (noun).

CG

'Data' in computer science refers to pieces of information or facts that are collected, stored, and processed by computers. It can include text, numbers, images, and more. Computers use data to perform tasks, make decisions, and generate outputs. In programming and computer science, data is crucial for creating algorithms and programs that manipulate and analyze information to achieve various goals.

LL Explain 'algorithm' (noun).

CG

An 'algorithm' in computer science is a step-by-step set of instructions designed to solve a specific problem or complete a task. It's like a recipe that guides a computer on how to perform a certain task. Algorithms are used in programming to outline the logical sequence of operations needed to achieve a desired outcome. For example, searching for information in a database, sorting a list of items, or solving mathematical equations all involve using algorithms to define the necessary steps for the computer to follow.

LL Explain 'base' (verb).

CG

To 'base' something in computer science means to establish or build upon a fundamental foundation or starting point. It's like creating something by using a core concept or principle as a basis. In programming, decisions and actions are often 'based' on certain conditions or data. For instance, you might 'base' a program's behavior on whether a specific condition is true or false. This helps structure the logic of the program and determine its outcomes.

LL Explain 'node' (noun).

CG

A 'node' in computer science refers to a fundamental element within a network or data structure. It's like a point or junction that connects and interacts with other elements. In computer networks, a node could be a device like a computer or a router that is part of the network. In data structures like linked lists or trees, a node holds data and pointers to other nodes, forming a connected structure. Nodes play a crucial role in organizing and managing information, enabling efficient communication and storage within various computer systems.

LL Explain 'modulation' (noun).

CG

'Modulation' in computer science refers to the process of varying or altering a carrier signal's properties in order to transmit data over a communication channel. It's like adjusting the pitch of your voice to send a message clearly. In computer networks, modulation is used to encode digital data into analog signals that can be transmitted over mediums like radio waves or optical fibers. This process allows information to be sent and received accurately despite environmental factors or signal limitations.

Requesting definitions of computer science jargon at an IELTS 5.5 proficiency

(ChatGPT-3.5) [08-17-23]

LL Explain 'system' (noun).

CG

A 'system' in computer science is like a group of parts that work together to do something specific. It's kind of like a team that has different members with different skills, and they cooperate to achieve a goal. In computers, a system could be software and hardware that work together to make a computer do tasks.

LL Explain 'data' (noun).

CG

'Data' in computer science means pieces of information that computers use to do things. It's like the ingredients in a recipe – the computer follows the instructions based on the data it gets. For example, numbers, words, images, and more can be data that a computer uses to perform tasks or show you things on the screen.

LL Explain 'algorithm' (noun).

CG

An 'algorithm' in computer science is like a step-by-step recipe that tells a computer how to solve a problem. It's similar to following a set of instructions to complete a task. Computers use algorithms to perform various tasks, like sorting numbers, searching for information, or making decisions. It's like a computer's plan for getting things done.

LL Explain 'base' (verb).

CG

To 'base' something in computer science means to build or create it using a particular starting point or foundation. It's like using a basic idea or concept as the starting point for developing more complex things. For instance, programmers might base their software on existing code to save time and effort, using it as a foundation to build upon. So, 'base' as a verb is about using something as a starting point to create something new in the world of computers.

LL Explain 'node' (noun).

CG

In computer science, a 'node' is like a point in a network or a structure. It's a part of a larger system, like a point on a map where lines connect. In things like computer networks or data structures, nodes are like the building blocks that hold and connect data. Think of nodes as the individual dots that make up a bigger picture, allowing things to be connected and organized.

LL Explain 'modulation' (noun).

CG

'Modulation' in computer science is like changing or adjusting something in a structured way. It's a bit like tuning a radio to get a clear signal – you're adjusting a property to make it work better. In computer networks or communication, modulation means changing the characteristics of a signal so that data can be transmitted more efficiently over long distances. It's like altering the way information is sent so that it can travel smoothly through different channels.

Appendix N: Analyze Roots of ‘Algorithm’ at an L1 Proficiency

In order to analyze a word’s affixes and root, it must be a possibility that a word not have any affixes. We can see how ChatGPT may not identify such a possibility, misleading the learner.

Analyze Affixes and Root of ‘algorithm’

(ChatGPT-3.5) [08-14-23]

Analyze the affixes and root of ‘algorithm’.

Certainly! The word ‘algorithm’ consists of two main parts: the root ‘algo-’ and the suffix ‘-rithm.’

Root: ‘Algo-’ In computer science, the root ‘algo-’ comes from the Latin word ‘algorismus,’ which is derived from the name of the Persian mathematician Al-Khwarizmi. Al-Khwarizmi made significant contributions to mathematics and introduced the concept of algorithms. The root ‘algo-’ in ‘algorithm’ refers to the systematic set of instructions that the term represents.



Suffix: ‘-rithm’

The suffix ‘-rithm’ comes from the Greek word ‘arithmos,’ which means ‘number.’ In the context of ‘algorithm,’ the suffix ‘-rithm’ is combined with the root to form the word that describes a precise sequence of steps or rules used to solve computational problems.

Overall, ‘algorithm’ is a term that combines the historical influence of Al-Khwarizmi’s work with the Greek concept of ‘arithmos,’ resulting in a word that represents a structured approach to solving problems in computer science through a defined sequence of steps.

This example illustrates ChatGPT’s tendency of accommodating to presuppositions, here assuming that ‘algorithm’ can indeed be broken down into two or more meaningful parts, rather than considering the dependant factor of “Can this word be broken down into meaningful parts?”. This illustrates its limitations in identifying and explaining prescriptive grammar.

Two ways someone might challenge its response is whether ‘-rithm’ is even an affix (which it isn’t), and if it were, what other words might similarly have ‘-rithm’ as a suffix.

Words with '-rithm' Affix

(ChatGPT-3.5) [09-08-23]

LL Give me a list of words containing the suffix -rithm.

Sure, here are some words containing the suffix '-rithm':

1. Algorithm
 2. Rhythm
 3. Polyrrhythm
 4. Isorhythm
 5. Sororithm
 6. Arrhythmia (an alternate spelling of arrhythmia)
- These are some examples, but the list may not be exhaustive.

LL Define 3-6

Certainly, here are the definitions for words 3 to 6:

3. **Polyrrhythm:** Polyrrhythm is a musical term that refers to the simultaneous use of two or more contrasting rhythms in a piece of music. It creates a complex and layered rhythmic pattern.
 4. **Isorhythm:** Isorhythm is another musical term, describing a compositional technique in which a repeating rhythmic pattern, called a *talea*, is used alongside a repeating melodic pattern, called a *color*. It was commonly used in medieval and Renaissance music.
 5. **Sororithm:** I apologize, but 'sororithm' doesn't appear to be a commonly recognized word in the English language, and I couldn't find a specific definition for it.
 6. **Arrhythmia:** Arrhythmia is a medical term referring to an irregular heartbeat. It can manifest as a heart beating too fast (tachycardia), too slow (bradycardia), or with an irregular rhythm. Arrhythmias can be harmless or indicate underlying heart issues, requiring medical attention.
- Please note that 'sororithm' might be a rare or specialized term not included in standard dictionaries. If you have any specific context or usage in mind for this word, please provide additional details.

LL Did you just hallucinate sororhythm being a word?

I apologize for the error in my previous response. 'Sororithm' is not a recognized word in the English language, and it appears to have been a mistake in my previous response. Thank you for pointing that out, and I appreciate your understanding. If you have any other questions or requests, please feel free to ask.

LL Interesting that you can make up words.

I apologize for the mistake earlier. As a language model, I don't intentionally make up words, but I can generate responses based on patterns and associations in the text data I was trained on. Sometimes, errors or incorrect responses can occur, and I appreciate your understanding. If you have any more questions or need assistance with anything else, please feel free to ask.

LL If you were to define the fake word 'sororhythm', what would you say it means?

If we were to invent a meaning for the word 'sororhythm,' it could be imagined as a term representing a synchronized or harmonious rhythm associated with sisterhood or female bonds, combining 'soro-' (related to sisters) and 'rhythm' (a pattern of beats or movements). Again, it's worth emphasizing that this is a fictional definition since 'sororhythm' is not a recognized word in the English language.

Couple things to note... I changed the spelling of 'sororithm' to 'sororhythm' half-way through the conversation. It only followed suit after I asked it to hypothesize a definition.

In a new chat, so as not to confuse it, I asked *whether* it can indeed be broken down into a root with affix(es), and then asked for affirmation of its response.

Word parts of 'algorithm'

(ChatGPT-3.5) [09-12-23]

LL Can 'algorithm' be broken down into any meaningful parts?

Yes, the word 'algorithm' can be broken down into meaningful parts, known as morphemes. In linguistics, a morpheme is the smallest unit of a word that carries meaning. In the case of 'algorithm,' it consists of two morphemes:

1. Algo-: This prefix is derived from the Latinized form of the name 'Algoritmi,' which, as mentioned earlier, is associated with the Persian mathematician al-Khwarizmi. In this context, 'algo-' serves to reference the historical origin of the term and carries the meaning of a systematic method or procedure.
2. -rithm: This suffix, '-rithm,' is derived from the Greek word 'arithmos,' which means number. In the context of 'algorithm,' it signifies a systematic process or set of steps for dealing with numbers or mathematical operations.

So, when you break down 'algorithm' into its morphemes, you have 'algo-' referring to a systematic method and '-rithm' relating to numbers or mathematical processes. Together, they form a word that signifies a systematic and well-defined set of instructions or steps for solving problems, often involving mathematical operations.

LL Really?

I apologize for any confusion in my previous response. Upon further consideration, I realize that my breakdown of 'algorithm' into 'algo-' and '-rithm' was not accurate. 'Algorithm' is not typically dissected in this way in the English language, and it is not composed of distinct morphemes with individual meanings.

'Algorithm' is considered a single, indivisible word in English, and its origin, as I explained earlier, is based on the name of the Persian mathematician al-Khwarizmi. I appreciate your patience and understanding, and I apologize for any confusion my previous response may have caused.

Word Formation Processes of 'algorithm'

(ChatGPT-3.5) [09-12-23]

LL Which word formation process: 'algorithm'?

The word 'algorithm' is a loanword in English. It was borrowed from the name of the Persian mathematician and scholar Muhammad ibn Musa al-Khwarizmi, who lived during the Islamic Golden Age in the 9th century. Al-Khwarizmi made significant contributions to mathematics, including the development of algebra and systematic methods for solving linear and quadratic equations.

CG The word 'algorithm' originally referred to the mathematical techniques and procedures outlined in al-Khwarizmi's works. Over time, its meaning expanded to refer to any step-by-step procedure or set of rules used to solve a problem or perform a task, whether in mathematics, computer science, or various other fields. Today, 'algorithm' is a commonly used term in computer science and technology to describe a finite sequence of well-defined instructions for performing a specific task or solving a problem, such as sorting data or searching for information on the internet.

LL In Persian, which process applies to 'algorithm'?

CG In Persian, the word for 'algorithm' is **الگوریتم** which is transliterated as 'algorithm' or 'algoritm.' This term is often used in the Persian language to refer to the concept of algorithms in mathematics and computer science.

LL So it's a root

CG Yes, in Persian, **الگوریتم** ('algorithm') can be considered a root word for the concept of algorithms in mathematics and computer science. It's the base word used to describe these systematic procedures and methods. Different languages may use variations or adaptations of this root word to refer to the same concept.

LL Is 'algorithm' a root?

CG I apologize for any confusion earlier. In linguistic terms, a 'root' typically refers to a basic form of a word to which prefixes, suffixes, or other affixes can be added to create derived or inflected forms. 'Algorithm' itself does not have prefixes or suffixes that are commonly added to it in English, so in that sense, you could consider it a root. However, the word 'algorithm' itself was derived from the name of the mathematician al-Khwarizmi, so it's a derivative of his name rather than a root in the traditional linguistic sense. It's important to note that linguistic terminology can vary, and the classification of a word as a 'root' or not can depend on the context and the specific language being discussed.

LL In English, is 'algorithm' a root or a base word?

CG In English, 'algorithm' is typically considered a base word rather than a root. A base word is a word to which prefixes or suffixes can be added to create derived or inflected forms. In the case of 'algorithm,' it was derived from the name of the Persian mathematician al-Khwarizmi and has not typically undergone further affixation in English. While it can serve as a base for creating related terms (e.g., 'algorithmic'), it is not a root word in the traditional linguistic sense, which is a word that cannot be further divided into smaller meaningful units.

This example is the first which doesn't suggest that 'algorithm' could be further broken down into meaningful units. It's also the first to raise the concept of 'base'. I asked again, "Is 'algorithm' a root?" after noting that assumption in the prompt ("So it's a root"), to challenge ChatGPT's certainty and tendency for presupposition accommodation. Finally, I requested clarity regarding its function as a base or root. The final response really would have been the ideal for the very first time I prompted it to "analyze root and affixes of 'algorithm'?"