Equalizer, Motivator, Confidence Booster: How ChatGPT Can Enhance English Language Skills and Learning Motivation for EAL Students

ISANA

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Mira Kim (UNSW) and James Bedford (UNSW)

Image: Adobe Firefly (2023)

Overview

In today's workshop, we will cover the following topics:

PART ONE: What is generative AI and how does it work?

PART TWO: How can GENAI support EAL students' learning?

CASE STUDY– Qin

PART ONE

WHAT IS GENERATIVE AI?

What is Generative AI?

Generative AI is a type of artificial intelligence **that creates original content, like text, images, or music based on human input.** By learning from existing data using machine learning algorithms and deep learning techniques such as neural networks, it can produce artefacts similar to what a human could produce.

LIST OF POPULAR GENAI TOOLS STUDENT ARE USING

Tool Name	Developer	Primary Use	Availability	Description
ChatGPT	OpenAI	Text generation, conversations	Paid/Free Tier	Users can submit questions and have human-like conversations based on inputs. Paid subscription includes: plug-ins, Dall-E image generator, Advanced Data Analysis, ability to analyse files, images.
DALL-E	OpenAI	Image generation	Paid/Free Tier	Users submit text to create images and artworks
Bing	Microsoft	Text generation, conversations	Free	A conversational chatbot similar to ChatGPT
Grammarly and GrammarlyGO	Grammarly Inc.	Editing tool	Paid/Free Tier	Advanced grammar checking, style and tone suggestions, plagiarism detection
Elicit	Ought	Research assistance	Paid/Free Tier	Uses language models to automate part of researchers' workflows, including brainstorming research questions.
Keenious	Keenious Limited	Research assistance	Paid/Free Tier	Assists in finding relevant academic papers and data based on text inputs, PDF submissions and weblinks.
Scite.Ai	Scite	Research assistance/citation tool/text generation	Paid (Free for UNSW students)	Users can search databases, find relevant sources, use an AI assistant, cite information, and generate text.
Firefly	Adobe	Image generation	Paid (Free for UNSW staff and students)	Part of the Adobe Creative Suite, Firefly offers AI-powered image generation and editing features.
Jenni.ai	Jenni.ai	Research assistance/text generation/citation tool	Paid/Free Tier	Users can generate content ideas, outlines, paragraphs, summaries and more using advanced AI and generative AI features. Also includes citation functionality and can locate relevant sources.
Claude	Anthropic	Text generation, conversations	Free	AI language model focused on providing safe, helpful, and truthful responses. Aimed at reducing risks associated with AI language models.

What some have said against ChatGPT…

"a stochastic parrot" Bender, E.M., Gebru, T., McMillan-Major, A. and Shmitchell, S. (2021)

"a grotesque mockery of what it means to be human" Nick Cave (Jan 2023)

"the banality of evil: plagiarism and apathy and obviation" Noam Chomsky (March 2023)

Image: Midjourney 'The Decoder' (2023)

What others have said….

“We’re at the cusp of using AI for probably the biggest positive transformation that education has ever seen” (Sal Khan, Founder of Khan Academy, 2023).

Image: Adobe Firefly (2023)

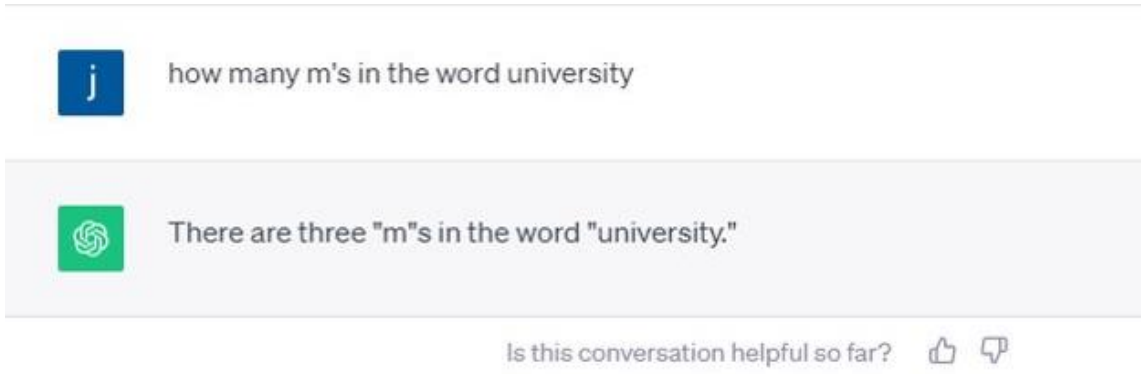
Potential dangers of GenAI

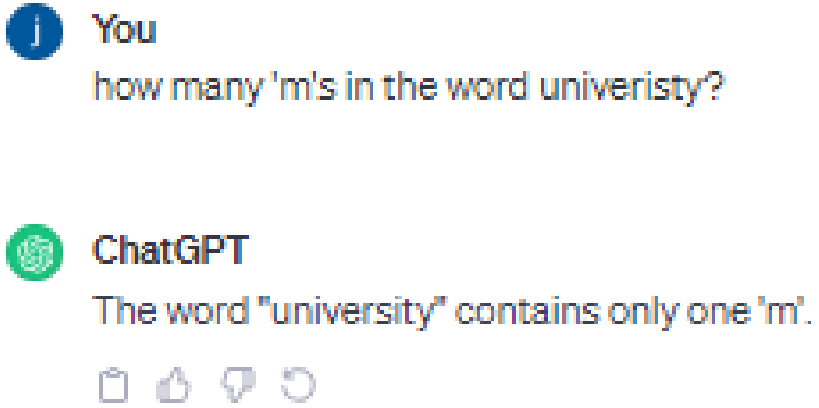
1. Issues with detection, especially when it comes to EAL students (Cotton, Cotton & Shipway, 2023; Liang et. al. 2023).
2. Might decrease students' higher-order thinking skills (Putra 2023).
3. May tempt students to submit work that is not their own (Perkins 2023).
4. Hallucinates sources and information (Mollick and Mollick 2023).
5. Concerns about privacy and data collection (Borenstein and Howard 2021; Khowaja, Khuwaja and Dev 2023).
6. Ingrained biases and potential for discrimination (Borenstein and Howard 2021).
7. May discourage students from seeking human support and collaboration (to the best of my knowledge no research has been done on this)

Potential Benefits

1. More than just a calculator. Can provide co-regulation and hybrid learning partnerships (Lodge et al., 2023).
2. Instant and personalised feedback on writing and research related tasks (Kasneci et al., 2023).
3. Multilingual capabilities: GenAI tools can provide support to students in multiple languages.
4. Discussion of texts: AI could help students understand and clarify ideas in academic articles and readings.
5. GenAI could provide 24/7 academic support customised to each student's needs and language background.
6. Grammar correction: GenAI has the capability to detect grammar and syntax errors in a student's writing.
7. Vocabulary building: GenAI tools could help students expand their vocabulary in English via quizzes and conversational exchanges
8. Supporting autonomous learning: creating learning materials, exercises, and assessments, catering to different skill levels and preferences

ChatGPT generates plausible text.
It does not always generate truthful responses.





Can AI-Generated Text be Reliably Detected?

Vinu Sankar Sadasivan
vinu@umd.edu

Aounon Kumar
aounon@umd.edu

Sriram Balasubramanian
sriramb@umd.edu

Wenxiao Wang
wwx@umd.edu

Soheil Feizi
sfeizi@umd.edu

Department of Computer Science
University of Maryland

Abstract

The rapid progress of Large Language Models (LLMs) has made them capable of performing astonishingly well on various tasks including document completion and question answering. The unregulated use of these models, however, can potentially lead to malicious consequences such as plagiarism, generating fake news, spamming, etc. Therefore, reliable detection of AI-generated text can be critical to ensure the responsible use of LLMs. Recent works attempt to tackle this problem either using certain model signatures present in the generated text outputs or by applying watermarking techniques that imprint specific patterns onto them. In this paper, both empirically and theoretically, we show that these detectors are not reliable in practical scenarios. Empirically, we show that *paraphrasing attacks*, where a light paraphraser is applied on top of the generative text model, can break a whole range of detectors, including the ones using the watermarking schemes as well as neural network-based detectors and zero-shot classifiers. We then provide a theoretical *impossibility result* indicating that for a sufficiently good language model, even the best-possible detector can only perform marginally better than a random classifier. Finally, we show that even LLMs protected by watermarking schemes can be vulnerable against spoofing attacks where *adversarial humans* can infer hidden watermarking signatures and add them to their generated text to be detected as text generated by the LLMs, potentially causing reputational damages to their developers. We believe these results can open an honest conversation in the community regarding the ethical and reliable use of AI-generated text.

OpenAI

We will continue to provide resources and insights in this area, understanding that ultimately each institution will decide how to address these issues in a way and on a timeline that makes sense for their educators and students.

In the past year, different school districts and universities have created new policies around AI-generated content. We encourage educators to do their own research on these different approaches to find what works best for them.

Do AI detectors work?

- In short, no. While some (including OpenAI) have released tools that purport to detect AI-generated content, none of these have proven to reliably distinguish between AI-generated and human-generated content.
- Additionally, ChatGPT has no "knowledge" of what content could be AI-generated. It will sometimes make up responses to questions like "did you write this [essay]?" or "could this have been written by AI?" These responses are random and have no basis in fact.

Short answer. No.

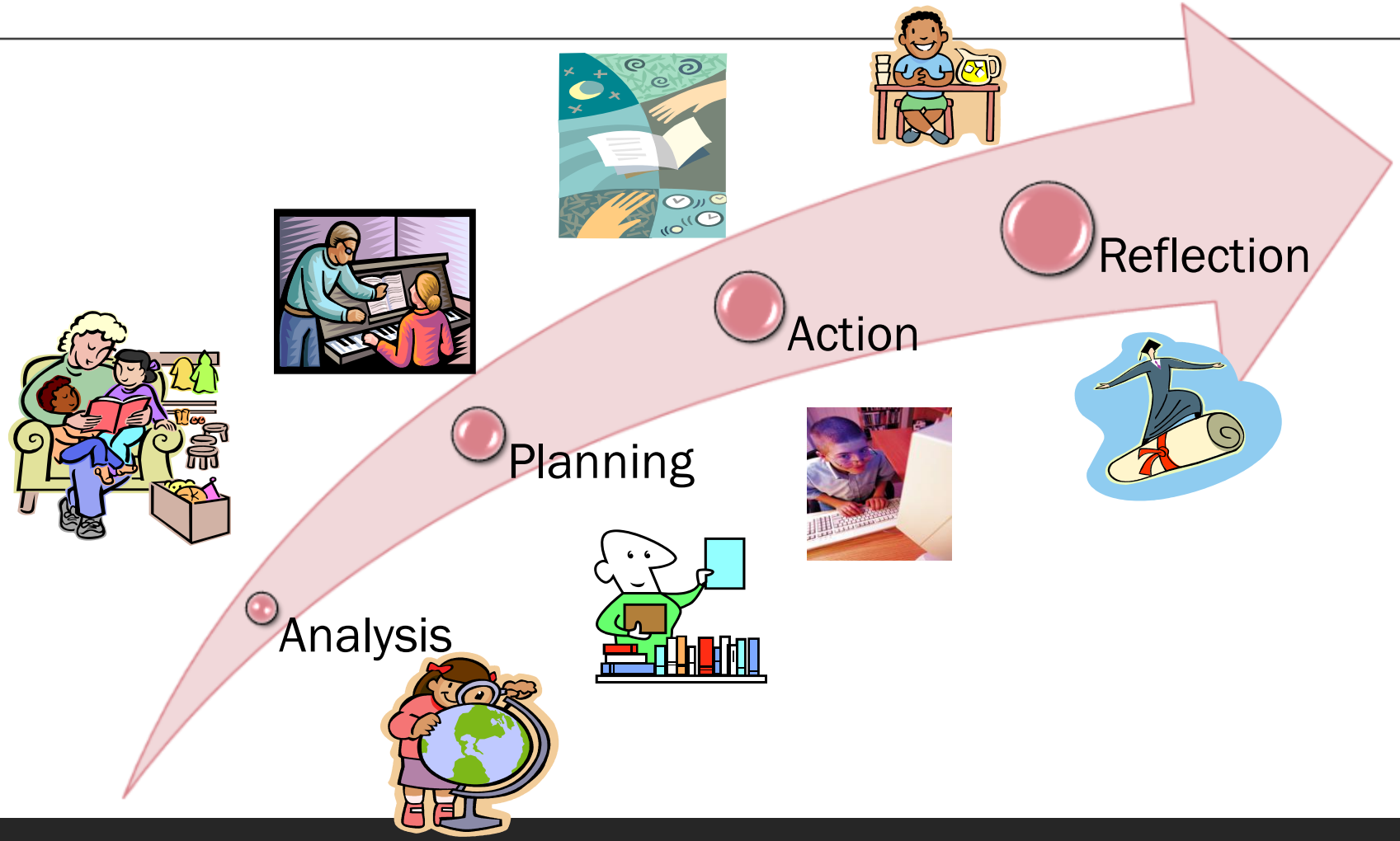
GPT detectors exhibit bias against EAL students (Liang et. al. 2023)

- Study evaluated 7 popular GPT detectors on 91 TOEFL essays and 88 8th grade essays.
- The detectors demonstrated near perfect accuracy detecting 8th grade essays as human.
- However, detectors falsely flagged over half of TOEFL essays as "AI-generated“ (61.22% false positive rate)
- 18 out of 91 (19.78%) TOEFL essays were unanimously identified as AI.
- Those that were identified had significantly lower “perplexity”, suggesting detectors penalize non-native writers with limited expressions.
- **“Our findings reveal that these detectors consistently misclassify non-native English writing samples as AI-generated, whereas native writing samples are accurately identified” (Liang et. al. 2023, pp. 2).**

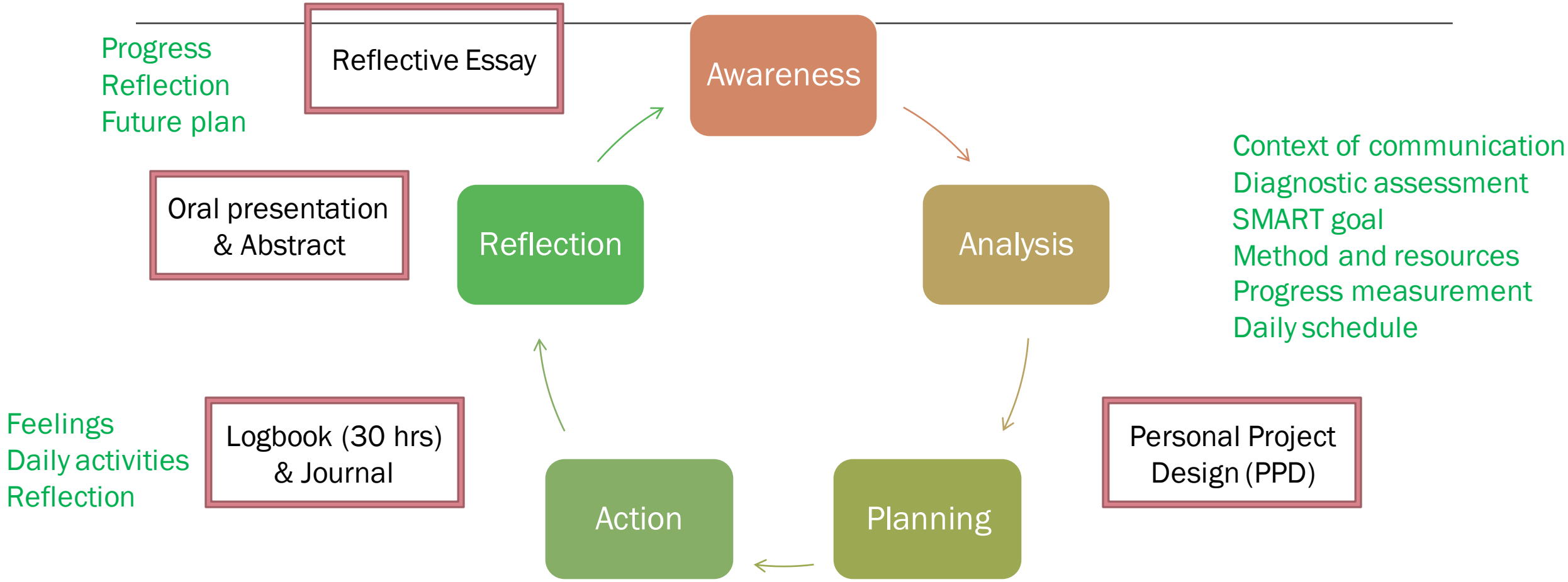
PART TWO

HOW CAN GENAI SUPPORT EAL STUDENTS' LEARNING IN A PERSONALISED AUTONOMOUS LEARNING ENVIRONMENT?

Personalised Autonomous (PA) Model



PA Learning Cycle and Assessments



Case study of Qin

Qin, **a PhD student** from China, **began his English education in kindergarten**, a pursuit shaped by his parents' aspirations for his international schooling. Recognized for his linguistic talent, he led reading sessions and was the voice of the school's English broadcasts in his 7th grade. **His proficiency secured him a place in an international high school, skipping a year to advance his studies**. During his university studies in mechanical and manufacturing engineering, Qin confronted **unexpected challenges**, particularly in writing, which revealed a gap between his and native English speakers' writing skills, leading to **a sense of insecurity**. His confidence waned in his honours year after receiving **unclear and critical feedback** on his literature review, and **a lack of support from his supervisor**. Starting his PhD with optimism due to a multilingual supervisory team, his morale was soon undermined by **journal rejections and ambiguous advice on his writing**, leaving him **feeling lost** and questioning his path.

Qin's personal project

Feedback on his chapters: "too informal", "sounds like a high school student's essay"

Designed his personal project to enhance the formality of his academic writing by working on paragraph coherence and cohesion, nominalisation as well as improving his academic vocabulary

Qin used ChatGPT to:

- Ask tailored questions and provide him with examples of new words in an academic context
- Correct grammar mistakes in his draft writing so that he can concentrate on developing content
- Reorganise information for textual coherence
- Explain reasons for edits

As a consequence, he improved his academic writing skills, reignited his passion for writing, and regained his confidence.

Qin's personal project: Pros and Cons of ChatGPT

POSITIVE ASPECTS:

- Engaging in a **back-and-forth dialogue** was helpful and felt **non-judgemental.**
- **Understanding the reasons for edits** motivated him to write more.
- ***Praise-criticism-praise*** structure boosted motivation.
- Providing **24/7 support** alleviated procrastination in the autonomous learning environment.

NEGATIVE ASPECTS:

- ChatGPT sometimes provided unhelpful or incorrect suggestions. (In these situations, Qin sought guidance from language experts.)
- Sometimes it was hard to tell if ChatGPT was being 'too nice'
- Hallucinated sources that didn't exist
- Lacked nuance of an expert human perspective

James Ciyu Qin (2023)
HDR Student, UNSW

Conclusion

EAL STUDENTS OFTEN STRUGGLE WITH ACADEMIC ENGLISH LANGUAGE BARRIERS THROUGHOUT THE WRITING AND RESEARCH PROCESS.

LLMS HAVE THE POTENTIAL TO PROVIDE PERSONALISED AND SCALABLE SUPPORT IN AUTONOMOUS LEARNING ENVIRONMENTS TO ENGLISH AS AN ADDITIONAL LANGUAGE (EAL) STUDENTS.

WHILE AN EXCITING PROSPECT, THE IMPLEMENTATION OF GENAI REQUIRES CAREFUL AND DEEP CONSIDERATION OF THE POTENTIAL PITFALLS AND CHALLENGES, INCLUDING: MISINFORMATION, BIAS, HALLUCINATIONS AND ACADEMIC INTEGRITY.

Where to from here…

We need to develop ethical frameworks for adopting AI both in and outside the classroom collaborating with students as partners.

Students need to be guided to develop their ‘AI Literacy’ with a clear understanding about the challenges and pitfalls surrounding these tools.

We need to make various pedagogical adjustments including assessments to reflect new challenges and opportunities of the AI era

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