

# Impact of Generative AI Adoption in Academia and how it influences Ethics, Cognitive Thinking and AI Singularity

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**Abstract -** Our Gen Alpha, born between year 2010 and 2024 see and experience more of AI and they adapt quickly to AI and will have less impact on advancements in Technology when compared to Generation X (1965-1980); Generation Y (Millennials) born from 1980 to 1994; Generation Z from 1995 to 2009. The reason is that Gen Alpha constantly uses electronic gadgets either in gaming, learning or for social media. They are susceptible quickly to Generative AI when compared to Gen X, Gen Y or Gen Z. Especially in Academia, where Gen Alpha is more encouraged to Generative AI such as ChatGPT in homework, assignments, and in research. Well, this is a good approach for those who are struggling to complete their work or for those who do not have a clue on how to complete their homework, assignment, or research. On other hand, the Generative AI tools such as ChatGPT are slowly becoming a part of the eco system that students lean on the Generative AI tools instead of doing research or thinking critically. As a result, there will be some behavioral changes that will be developed over a period. These behavioral changes are, impatient for answers to the problems, express panic while solving a problem, shows anxiety, low self-esteem in solving a problem, and low confidence factor. There is always a positive side of Generative AI, if we look at it from a different angle. Some of them are, it helps an individual and guides them with possible answers, all individuals can ask questions using prompt engineering and get responses. But the fact of the matter is how authentic the response from Generative AI is a question? Can the author quote the responses he/she received from ChatGPT and How can we avoid plagiarism? How can we reduce bias? How can we avoid AI singularity?

*Index Terms –* Generative AI, ChatGPT, Guardrails, Singularity, AI Models, Large Language Models, ML.

## INTRODUCTION

Usage of Generative AI such as ChatGPT tool in Academia poses some challenging questions in our mind; A few of such examples were.

Does ChatGPT help students in solving problems or in finding answers to the questions?

What is the impact on Cognitive/Critical Thinking by using ChatGPT (Gen AI) in Academia?

What are the psychological implications on students by using ChatGPT and how it impacts social interactions?

When I am at work/school/university and what challenges do I face if accessibility to Generative AI tool (ChatGPT) is not available?

Would there be a situation where AI Intelligence will take over Human Intelligence? How can we avoid AI Singularity?

Well, we may not have answers to the above questions but there is a hope that Generative AI will help us in finding precise answers and improve productivity. Generative AI is an Artificial Intelligence (AI) technology that can produce new and unique content, including text, images, audio, and videos. By learning from existing data, generative AI models can create highly realistic and complex outputs, resembling human creativity. This makes generative AI a valuable tool across various industries, such as gaming, entertainment, and product design [1]. The future of Academia depends more on Generative AI that will provide vast amounts of information quickly. This will also aid diverse learners with different learning abilities, linguistic backgrounds, or accessibility needs. Diverse learners have the capability to study the vast amount of data available and by using AI they can analyze data and build correlation.

## HYPOTHESIS

In our hypothesis we consider the data, processors (GPU's), Large Language Models, IT services and technology platforms which are vital for Generative AI that operate on Large Language Models. Without these, the social media and education platforms that depend on ChatGPT could be severely impacted since they depend on automatic content generation, improved content quality, increased content variety, and personalized content. The future of Generative AI seems promising. It is crucial for business to foster a culture of learning and adopt new technologies. Most importantly, engage employees in digital transformation and embrace AI adoption in business and IT processes. But another important factor to consider is to establish guardrails while using Generative IT in Business and IT process. These guardrails help in minimizing biased output, reduce output quality issues, reduce made-up facts and hallucination, reduce copyright, and legal risks and vulnerable to abuse.

AI systems can be trained in three ways, they are supervised learning, unsupervised learning, and reinforced learning.

In supervised learning, the machine learning model is trained on labelled data, where the desired outputs are already known. Supervised learning has many applications across industries and use cases. It is particularly useful for solving problems related to prediction, classification, and decision-making [3].

Unsupervised learning uses unlabeled data to train models to uncover hidden patterns or structures within the data [3].

Reinforcement learning involves an intelligent agent being trained to make decisions based on feedback [3].

ChatGPT uses deep learning, a subset of machine learning, to produce humanlike text through transformer neural networks. ChatGPT uses combination of supervised learning and reinforced learning to generate responses to user prompts.

Large Language Models consume a lot of energy. It is estimated that Open AI could be spending over \$100K every day just to run the Artificial Intelligence chatbot [4]. It costs more to get the best models,

According to estimates, ChatGPT emits 8.4 tons of carbon dioxide per year, more than twice the amount that is emitted by an individual, which is 4 tons per year. This makes a compelling case for us to revisit our strategies in Green IT and energy with a goal and a mission to reduce the carbon footprint [6].

## KEY FACTORS OR MATERIALS

- Interactive Learning
- Fun conversation
- Preparation for debate
- Brainstorming and ideation
- Essay writing and obtaining feedback.
- Reading comprehension
- Research

- Educate students and build materials.
- Writing blogs and frame emails
- Scheduling meetings
- Build content for Social Media Platforms

## PROCEDURE

We have considered two primary use cases to study and prove our hypothesis;

The following are the use cases;

**Case Study1:** Study of Carbon Emissions and comparing it with AI versus Humans

The following is the illustration demonstrating how carbon emissions are lower for AI than for Humans, based on the research square article that was published [5].

Carbon footprint (grams CO<sub>2</sub>e) for Text Writing

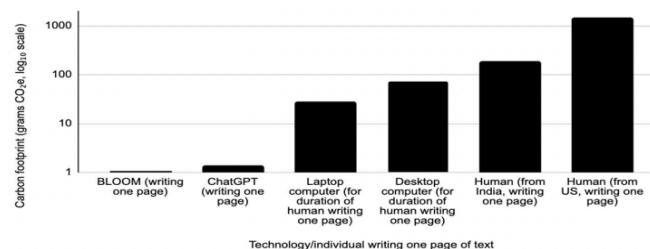


Figure 1. This figure compares the CO<sub>2</sub>e emissions of AI and humans engaged in the task of writing one page of text. AI writing (via BLOOM or ChatGPT) produces 130 to 1500 times less CO<sub>2</sub>e per page than a human author. AI also produces substantially less CO<sub>2</sub>e than the computer usage to support humans doing that writing.

Image Source [5]: <https://doi.org/10.1038/s41598-024-54271-x>

Carbon footprint (grams CO<sub>2</sub>e) for Image Creation

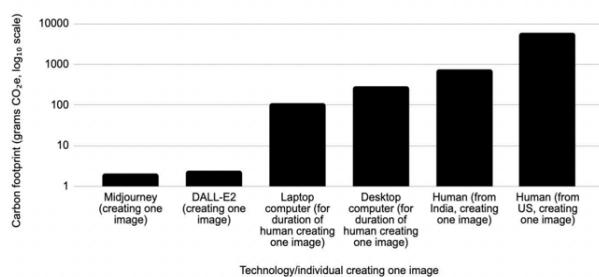


Figure 2. This figure compares the CO<sub>2</sub>e emissions of AI and humans engaged in the task of creating one image. AI image creation (via DALL-E2 or Midjourney) produces 310 to 2900 times less CO<sub>2</sub>e per image than human creators. AI produces many times less CO<sub>2</sub>e than computer usage to support humans making images.

Image Source [5]: <https://doi.org/10.1038/s41598-024-54271-x>

**Case Study2: To find the most essential and common factors for Generative AI (ChatGPT) in Academia.**

A study was conducted among different age groups with a sample size of 75. The survey was conducted with the above key factors, the responses to the survey are measured on a scale of 1 to 5, 5 being highest priority and 1 being a lowest. Based on the study, the following are the findings;

## DATA

The key factors that influence ChatGPT usage at different age groups in academia are as follows.

Age Group	Highest Priority	Moderate Priority	Lowest Priority
Children: 1-11 years or <8th grade.	Fun conversation	Comprehension	Writing blogs and frame content for emails
	Interactive Learning	Essay writing and obtaining feedback	Research
Teens: 12-17 years or 9th-12th grade.	Interactive Learning	Debate preparation	Writing blogs and frame content for emails
	Fun conversation	Essay writing and obtaining feedback	Scheduling meetings
		Research	Build content for Social Media Platforms
		Brainstorming and ideation	
Adults: 18+.	Interactive Learning	Build content for Social media platforms	Reading comprehension
	Fun conversation	Writing blogs and frame content for emails	Essay writing and obtaining feedback.
	Educate students and build materials	Scheduling meetings	Debate preparation
	Research	Brainstorming and ideation	

## RESULTS

Our case study and analysis has revealed important findings. As you can see from the above data analysis the children, youth and adults have few things in common from ChatGPT and that is why we want to use it for interactive learning and build fun conversations on various topics of interest. Adults and College students are more focused on using ChatGPT for productivity improvement, research, and brainstorming ideas. While High School students are more focused on upskilling and improving proficiency in the subject matter of expertise.

As we have discussed earlier in our paper, by putting the proper guardrails for the Generative AI will help humans to learn and upskill and reduce mundane tasks by focusing on the quality and productivity.

## CONCLUSION

In this paper, we have researched and documented the impact of Carbon Emissions by using Generative AI and the adoption of Generative AI in Academia and also how it influences students and educators. We have also discussed the benefits of Generative AI in the learning process at all age groups. Our study shows how Generative AI could improve an average student and level up his skills in the learning process, and how it could engage and guide the educators to tailor the learning modules for any individual from entry level to expert level.

Generative AI is shaping our future to reduce mundane tasks, such as responding to routine emails, scheduling meetings, answering basic questions, preparing test modules based on the user needs, helping student with reading comprehension, helping students with essay writing, and providing feedback to the essays, performing research on a specific topic etc., and the list goes on.

The future of AI depends on each of us as we establish guardrails at each stage while bringing in technical advancements that helps with human advancements and thinking process and shape the better living standards. The journey of AI is just the beginning in this new era of automation where AI uses Large Language Models with the focus on perfection and delivering accurate results.

AI is shaping our future and the world from Sci-fi myth to everyday reality. As the present innovations in AI are accelerating at a blazing fast pace and it has become apparent that AI will revolutionize how we operate and creates a huge impact to the society.

## ACKNOWLEDGMENT

Daniel Marimekala would like to thank his co-author, Professor John Lamb, for giving him the research opportunity. This paper is the result of the 2023 winter research study under the guidance of Professor John Lamb, Pace University, NY, USA.

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