



Is a high schooler better than AI at writing?

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I. Introduction

1. Abstract:

This research aims to get to a conclusion about whether a high schooler is a better or worse writer than artificial intelligence, more specifically [CHATGPT](#). The research findings suggest that humans are better than AI at writing/researching. The study employs a comparative analysis of the cognitive abilities of a 12th grader and ChatGPT.

2. Background Information:

Intelligence is a large and complex science. It is often defined as the ability to acquire and apply knowledge and skills, including reasoning, problem-solving, and learning from experience. Intelligence can be measured using standardized tests that measure intelligence, including language processing, reasoning, and spatial awareness. With recent advances in artificial intelligence, interest in comparing human and machine intelligence has grown. In this study, we investigated whether 12th graders were more intelligent than ChatGPT, a general language learning model from OpenAI.

3. Method:

This study uses a comparative analysis of the cognitive abilities of a 12th grader and AI.

4. Limitations:

ChatGPT is a testing software and only has data from 2021 onwards while humans have access to more data than ChatGPT. ChatGPT is opinionated while humans have their points of view.

5. Objectives and goals of the research:

With this research, we aim to identify the differences between AI and humans and whether can AI take over basic human work like writing.

6. What is ChatGPT?

What is Chat GPT? ChatGPT is a large language model that uses artificial intelligence to chat with users as if you were asking someone a question. The full version of ChatGPT is Chat Generative Pre-Trained Transformer. GPT (Generative Pretrained Transformer) is a language developed by OpenAI that has taken the world of Natural Language Processing (NLP) by storm.

II. Literature Review

1. Procedure:

In this study, we asked ChatGPT to write a research paper on the topic “The Future Of Electric Vehicles” and I wrote a research paper on the same topic as well. While ChatGPT took only a few seconds to write the paper, it was not able to write one that was longer than 2 pages, which is not enough for it to be used for any real world purposes.

2. Previous study on the topic:

There are various studies on this topic for essay writing like one done by: Željana Bašić, Ana Banovac*, Ivana Kružić, Ivan Jerković at University Department of Forensic Sciences, University of Split. This [study](#) found no evidence that using GPT as an authoring tool improves text quality, because the human group outperformed ChatGPT on most indicators.

3. Comparison Of Writing Styles and Quality:

The work produced by ChatGPT was impressive but it contained insufficient data and seemed incomplete. ChatGPT missed out on many points and topics that a human keeps in mind while writing a research. ChatGPT's research comes out to be bland and less appealing than a humans. Humans keep in mind the appeal of a paper and the emotions of people towards a topic.

III. Methodology

1. Selection of sample texts

Introduction of research/study by ChatGPT:

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write a research paper on the future of electric vehicles



Abstract:

This research paper aims to provide an overview of the current state and future prospects of electric vehicles (EVs). The paper examines the environmental benefits of EVs, the challenges associated with their adoption, and the technological advances that are driving their development. The study suggests that the adoption of EVs will continue to grow in the coming years, driven by decreasing costs, improved performance, and increasing environmental awareness. The paper concludes by discussing the potential impact of EVs on the automotive industry, energy infrastructure, and society as a whole.

Introduction:

The automotive industry is undergoing a significant transformation as electric vehicles (EVs) become increasingly popular. The adoption of EVs is being driven by concerns about climate change, rising fuel costs, and advances in battery technology. The shift towards EVs has significant implications for the automotive industry, energy infrastructure, and society as a whole. In this study, we examine the current state and future prospects of EVs.

Introduction of Research paper done by a High Schooler:

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Introduction

Electric cars have been around for a while, but only recently have they become a viable option for consumers looking for an environmentally friendly mode of transportation. The growth of electrical cars is predictable to continue in the future, with more and more people choosing to purchase electric cars. This paper explores the future of electric cars, including the latest advancements in technology, the environmental impact of electric cars, and the potential challenges.

Key differences between AI and Human work:

Environmental Benefits of EVs:

One of the primary benefits of EVs is their environmental impact. EVs produce zero emissions, reducing air pollution and greenhouse gas emissions. In addition, EVs are more energy-efficient than traditional combustion engine vehicles, requiring less energy to travel the same distance. The environmental benefits of EVs make them an attractive option for individuals and organizations seeking to reduce their carbon footprint.

A. Here ChatGPT was only able to list the advantages of Electric Vehicles while the work done by humans showed the advantages and the downsides to Electric Vehicles.

C. Advantages and disadvantages of electric cars

Advantages of electric cars include:

- Zero emissions: Electrical cars yield no releases, which means they are healthier for the atmosphere than old-style gasoline-powered wagons.
- Lower operating prices: Electrical cars have inferior functioning costs than gasoline-powered cars because energy is inexpensive than gas.
- Quieter operation: Electrical cars are quieter than gasoline-powered cars, which makes them ideal for city driving.
- Prompt torque: Electrical motors provide instant twisting, which means electric cars can fast-track smoothly and quickly.

Shortcomings of electrical cars include:

- Inadequate range: Electrical cars still have a limited range compared to gas-powered cars, making long-distance travel hard.
- High initial cost: Electrical cars can be more luxurious to buying than gasoline-powered cars, although this cost is coming down as technology improves.
- Charging substructure: Whereas the charging substructure for electrical cars is growing, it is still not as extensive as gas posts, making it challenging to find a apartment to charge your car when you are on the go.
- Battery disposal: The discarding of batteries at the culmination of their lifespan can be challenging, as they can be difficult to recycle and may contain hazardous materials.

B. Here ChatGPT only provided a few points for “THE FUTURE PROSPECTS OF ELECTRIC VEHICLES” while the human written research has provided us with 4 sub topics:

Future Prospects for EVs:

The adoption of EVs is expected to continue to grow in the coming years. Falling battery costs, increasing range, and the development of charging infrastructure are all driving the adoption of EVs. In addition, governments around the world are implementing policies to encourage the adoption of EVs, including incentives for consumers and regulations on emissions. The growth of EVs is expected to have a significant impact on the automotive industry, with many traditional automakers shifting their focus towards EVs. The growth of EVs is also expected to have a significant impact on the energy industry, as the increased demand for electricity to power EVs will require significant changes to energy infrastructure.

IV. Future of electric cars**A. Technological advancements**

One of the most exciting aspects of the future of electric cars is the potential for continued technological advancements. Electric cars will become more efficient as technology improves, with longer ranges and faster charging times. For example, researchers are exploring new battery technologies that could significantly increase the energy density of batteries, allowing for longer ranges and faster charging times. Solid-state batteries, which use a solid electrolyte instead of a liquid one, are being developed, which could increase energy density and improve safety. In addition, improvements in electric motors, power electronics, and materials science could lead to more efficient electric cars with higher performance.

B. Infrastructure development

Another critical factor in the future of electric cars is the development of charging infrastructure. As more consumers switch to electric cars, the demand for charging stations will increase. Private companies and Governments are capitalizing in the growth of charging infrastructure to make charging as convenient as refueling at a gas station. This includes the deployment of fast-charging postings along freeways and in urban zones and the development of wireless charging technology. In addition, innovative charging technology is being developed to manage the demand for electricity from electric cars and help balance the grid.

IJNRD2303450

International Journal of Novel Research and Development (www.ijnrd.org)

e372

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C. Cost reduction

The price of electrical cars has reduced in currently, and this trend is expected to continue. As production volumes increase and economies of scale are realized, the cost of batteries, electric motors, and other components will decrease, making electric cars more affordable. In addition, advancements in manufacturing processes and materials science could lead to further cost reductions. For example, using lightweight materials like carbon fiber could reduce the weight of electric cars, improving their efficiency and reducing the cost of materials.



D. Competition from other renewable energy sources

While electric cars are essential to the change to a low-carbon budget, they are not the only option. Other renewable energy sources, such as hydrogen fuel cells and biofuels, are also being developed. Hydrogen fuel cells use hydrogen to produce electricity, with water as the only byproduct. While the tech is still in the initial stages of growth, it has the probable to offer longer ranges and faster refueling times than electric cars. Biofuels are another renewable energy source that could be used in transportation. Biofuels are produced from renewable sources such as plants and algae and can be used in existing internal combustion engines. While biofuels are not as clean as electric cars or hydrogen fuel cells, they can significantly reduce greenhouse gas emissions compared to traditional gasoline. While electric cars currently have an advantage in market share, technological advancements, and government support, competition from other renewable energy sources could challenge their dominance in the future.

The future of electric cars looks promising, with continued technological advancements, infrastructure development, cost reductions, and government support. While challenges are to be addressed, such as limited range and high initial costs, electric cars offer a clean and efficient alternative to traditional gasoline-powered cars. As more consumers switch to electric cars, the environmental impact will be significant, with reduced emissions and improved air quality. The transition to electric cars also has the potential to create new jobs and opportunities for innovation in the electric car industry. While electric cars face competition from other renewable energy sources, they are well-positioned to be a significant player in transitioning to a low-carbon economy. As a high school student interested in joining college, there are many opportunities to get involved in the electric car industry, from engineering and manufacturing to policy and advocacy. The future of electric cars is bright, and it is an exciting time to be part of this vital transition.

IJNRD2303450

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e373

IV. Results**1. Comparison of writing quality College and above(U.S):**

For the research done by humans the readability test level comes out to be:

Readability Consensus	Word Count	Sentence Count	Average Sentence Length
College and above	404	19	21.26
FORMULA	SCORE	SCHOOL LEVEL (U.S.)	
Flesch Kincaid Grade	12.36	College and above	?
Gunning Fog Index	12.76	College and above	?
SMOG Index	14.33	College and above	?
Automated Readability	15.96	College and above	?
Coleman-Liau Index	15	College and above	?
Linsear Write	14.4	College and above	?
Dale-Chall Readability	9.19	College and above	?
McAlpine EFLAW Readability	28.11	—	?

For the research done by ChatGPT the readability test level comes out to be:

Readability Consensus	Word Count	Sentence Count	Average Sentence Length
College and above	490	25	19.6
FORMULA	SCORE	SCHOOL LEVEL (U.S.)	
Flesch Kincaid Grade	12.6	College and above	?
Gunning Fog Index	12	College and above	?
SMOG Index	14.84	College and above	?
Automated Readability	15.23	College and above	?
Coleman-Liau Index	14.97	College and above	?
Linsear Write	14.6	College and above	?
Dale-Chall Readability	8.35	11th to 12th grade	?
McAlpine EFLAW Readability	27.4	—	?

2. Comparison of writing style:

Comparison is based on the following 4 factors-

Correctness

Clarity

Engagement

Delivery

Research done by human-

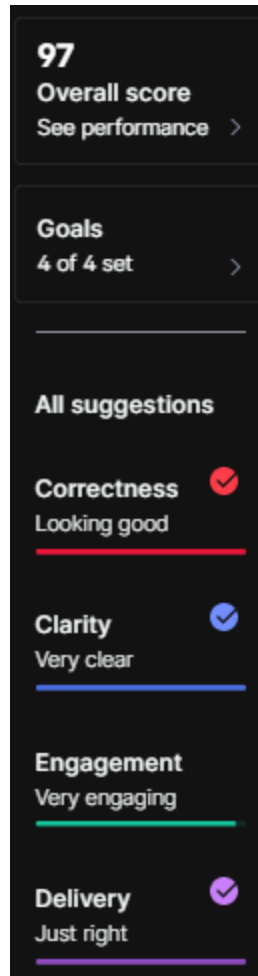
Overall score-97

Correctness- Good

Clarity- Very clear

Engagement- Very engaging


Delivery- Just right




97
Overall score
See performance >


Goals
4 of 4 set >

All suggestions

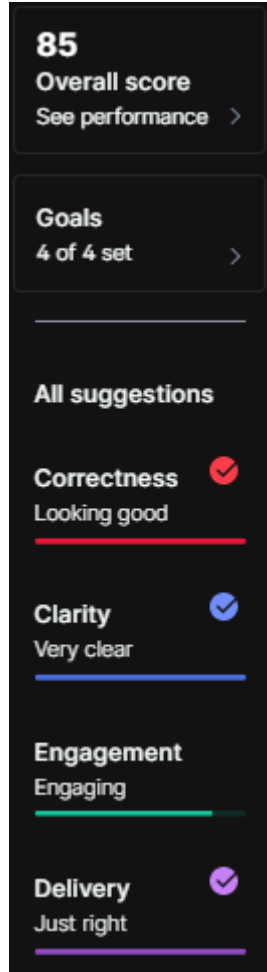
Correctness 
Looking good

Clarity 
Very clear

Engagement
Very engaging

Delivery 
Just right



Research done by ChatGPT-**Overall Score- 84****Correctness- Good****Clarity- Very clear****Engagement- Very engaging****Delivery- Just right*****3. Discussion of findings:***

If we compare the writing style and quality of AI and humans we observe that AI scores way lower than a human in the comparison of writing style.

Moreover, if we compare them on the basis of writing quality, AI has a really close score on the readability test compared to humans, and AI even scores higher than humans on some areas of the test.

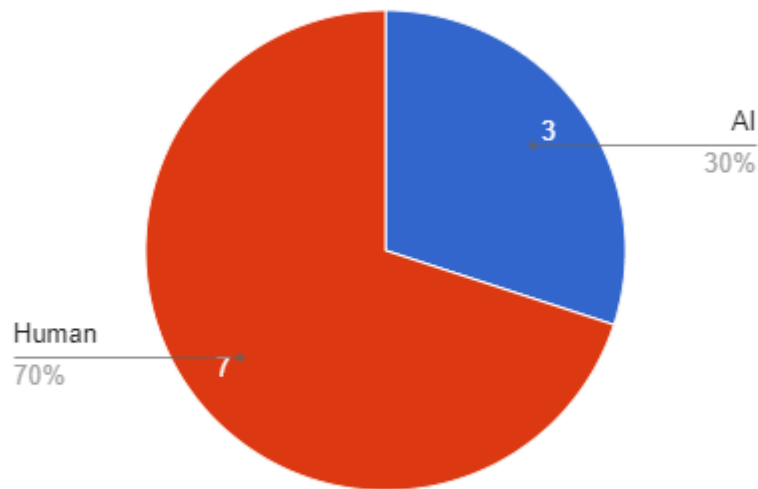
4. Survey results:

In the below pie chart we can see that out of a sample of 10-

Seven felt that human-written research papers were better, and the remaining three disagreed with the rest, respecting ChatGPT's efforts at this stage of ChatGPT's development.

The 7 people who think that the research paper written by humans is better agree with **Section IV.3** of this research.

AI VS Human



V. Discussion

1. Interpretation of results:

From the provided data we have a close difference between AI and humans but AI still needs to improve its writing style and delivery. AI misses some key points but keeps the errors to a minimum. Humans have many advantages like- delivery style, how to engage people and **humans can write longer essays/researches than AI.**

2. Limitations of study:

There are a few limitations to this research that are listed below-

1. ChatGPT is able to produce only a 500 word research paper.
2. Usage of some free online tools not providing detailed data.
3. The grammatical errors of humans are natural sometimes and need to be fixed.
4. Survey sample was too small.

VI. Personal point of view on the topic:

I think that at this point in time when AI is just on the rise it is a little unfair to compare AI and humans for something as strenuous as a research paper. ChatGPT gave the human research quite a fight in all the tests (quality, style, readability) and cut it close. AI would have had a greater chance to win if only the research was a little longer.

VII. References:

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