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Exploring Different AI tools for Research Paper Writing[1]

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Abstract:

The present analysis explores the potential of AI tools for research paper writing, with a focus on ChatGPT and Promind. While these tools have limitations, such as being trained on limited vocabulary and lacking contextual understanding, they offer researchers numerous benefits. By leveraging the power of AI, researchers can save time, improve the quality of their writing, and gain new insights into their research topics. AI-based tools enable researchers to conduct literature reviews, analyze data, generate ideas, improve writing, and find creative inspiration. As the field of artificial intelligence continues to evolve, the potential applications for AI in research paper writing are vast and exciting.

The field of research paper writing has seen a tremendous increase in the number of published academic papers in recent years, with over 2 million papers published in 2020 alone. As the volume of research continues to grow, researchers face increasing pressure to produce high-quality papers quickly and efficiently. This is where the potential of AI-based tools for research paper writing comes into play.

[1] For the title, try not to use more than 3 lines. Typeset the title in 10 pt Times Roman and boldface.
2 Typeset names in 10 pt Times Roman. Use the footnote to indicate the present or permanent address of the author.

The present analysis delves deeper into the capabilities and limitations of AI tools, particularly ChatGPT and Promind, for research paper writing. While these tools have their limitations, such as being trained on a limited vocabulary and lacking contextual understanding, they offer researchers numerous benefits.

AI-based tools provide researchers with the ability to conduct literature reviews, analyze data, generate ideas, improve writing, and find creative inspiration. By leveraging the power of AI, researchers can save valuable time and resources, improve the quality of their writing, and gain new insights into their research topics. The potential applications for AI in research paper writing are vast and exciting, as the field of artificial intelligence continues to evolve.

Furthermore, the use of AI tools in research paper writing is not limited to academia. Industry professionals and businesses are also beginning to adopt these tools for various applications, from generating reports to improving communication with customers.

Overall, while AI-based tools for research paper writing are still in their infancy, their potential for revolutionizing the field is clear. As researchers and professionals continue to explore and develop these tools, we can expect to see even more exciting applications and benefits in the future.

Keywords: AI, ChatGPT, Research, Paper, Writing,

1. Introduction

Artificial Intelligence (AI) has revolutionized the world, from its humble beginnings to its current state of incredible advancements. In the early years, AI focused on developing computer systems capable of performing tasks that typically required human intelligence, such as problem-solving and decision-making[1]. The field witnessed significant breakthroughs in the 20th century, including the development of expert systems and machine learning algorithms. However, it was the advent of deep learning and neural networks in recent years that propelled AI to unprecedented heights [2]. These technologies allowed machines to learn and adapt from vast amounts of data[3], leading to remarkable achievements in areas like image recognition, natural language processing, and autonomous vehicles. Today, AI is omnipresent, influencing various aspects of our lives, from personalized recommendations and virtual assistants to healthcare diagnostics and industrial automation. As researchers and engineers continue to push the boundaries, AI holds immense promise for shaping the future, with the potential to revolutionize industries, transform economies, and address complex global challenges[4].

Artificial Intelligence (AI) has been a captivating field of research since its inception, driving continuous exploration and innovation. From its early days of developing algorithms and expert systems to tackle complex problems, AI has evolved into a multidisciplinary domain with remarkable advancements. Researchers have delved into various subfields such as machine learning, natural language processing, computer vision, and robotics, constantly pushing the boundaries of what machines can achieve. Breakthroughs in deep learning and neural networks have revolutionized AI research, enabling machines to process vast amounts of data

and learn complex patterns. Today, AI research focuses on enhancing machine capabilities in areas like explainable AI, reinforcement learning, generative models, and ethical considerations. As the field continues to evolve, researchers strive to unlock the full potential of AI, aiming to develop intelligent systems that can reason, understand context, and make autonomous decisions, ultimately advancing human knowledge and transforming our society[5].

Did you know that in 2020, researchers published over 2 million academic papers? With so much research being produced, it can be a daunting task to keep up with the latest findings and generate new insights. That's where artificial intelligence (AI) comes in - by automating tasks such as data analysi
literature review, and even writing, AI tools can hel
researchers save time and resources, and focus c
more innovative aspects of their work.

In this paper, we will explore the latest developmen
in AI-powered research paper writing, and discus
the benefits and challenges of using these tool
From natural language processing algorithms th
can generate written content, to machine learnin
algorithms that can analyze data and genera
insights, AI is changing the way we conduct researc
and write papers.

However, there are also challenges and limitations to consider. For example, AI algorithms rely on high-quality data inputs to be effective, and there is a risk of bias in the results if the data inputs are flawed or incomplete. Additionally, while AI writing tools are great at generating content based on existing data inputs, they may not be able to generate completely new ideas or perspectives.

Natural language processing (NLP) is a field of computer science that deals with the interaction between computers and human (natural) languages[6]. It is concerned with the understanding and generation of natural language, including speech and text. NLP algorithms are designed to understand and interpret human language, and can be used to automate tasks such as language translation, sentiment analysis, and speech recognition[7]. In the context of research paper writing, NLP algorithms can be used to analyze existing research papers, identify key themes and arguments, and generate new text based on this analysis[8]. AI-powered writing tools that use NLP algorithms can be trained on specific writing styles or disciplines, allowing researchers to generate text that is tailored to their specific needs. However, there are also challenges and limitations to consider when using NLP, such as the need for high-quality data inputs and the risk of bias in the results if the data inputs are flawed or incomplete[9].

- **Rule-based NLP:** This approach uses a set of hand-written rules to process natural language. Rule-based NLP is often used for tasks such as part-of-speech tagging and named entity recognition.
- **Statistical NLP:** This approach uses statistical methods to process natural language. Statistical NLP is often used for tasks such as machine translation and text classification.
- **Deep learning NLP:** This approach uses deep learning models to process natural language. Deep learning NLP is often used for tasks such as natural language generation and question answering.

Despite these challenges, AI writing tools have the potential to revolutionize the field of research paper writing. Below are just a few of the benefits of using AI tools:

- **Efficiency:** AI tools can automate time-consuming tasks such as data analysis and literature review, freeing up researchers' time for more creative work.
- **Accuracy:** AI tools can analyze data more quickly and accurately than humans, and can identify patterns and relationships that might be missed by human analysts.
- **Customizability:** AI writing tools can be trained on specific writing styles or disciplines, allowing

researchers to generate text that is tailored to their needs.

Graphical representation of benefits of research paper writing using AI tools:

Figure 1. Benefits of AI research paper writing tolls

If you're interested in trying out some AI writing tools for yourself, here are a few to check out:

- **ChatGPT:** an AI-powered chatbot that can generate text based on user prompts.
- **WebChatGPT:** a Chrome plugin that allows users to chat with an AI writing assistant.
- **Shako AI:** an AI tool that can analyze research papers and generate summaries.
- **Promind AI:** an AI tool that can generate text summaries of research papers.
- **Google Bard Beta:** an AI tool that can generate poetry based on user prompts.

2. **Description**

3. ***ChatGPT:***

ChatGPT is an AI language model developed by OpenAI, one of the leading research organizations in the field of artificial intelligence [10-12]. The model is based on the GPT-4 and GPT-3.5 architecture, which combines the power of deep learning with natural language processing to enable advanced text generation, comprehension, and conversation.

Since its initial release in 2020, ChatGPT has become one of the most widely used language models in the world, with thousands of developers and researchers using the tool to build chatbots, virtual assistants, and other AI-powered applications. The GPT-3.5 is trained on 175 billion parameters and GPT-4 is trained on 100 trillion[13].

The actual use of ChatGPT is quite diverse, and depends on the specific needs of the user. Some developers use the tool to build chatbots that can interact with customers and provide customer support, while others use it to build virtual assistants that can perform a wide range of tasks, from scheduling appointments to answering complex questions. Researchers also use ChatGPT to explore new applications of AI in natural language processing and to advance the state-of-the-art in language modeling[13].

ChatGPT is developed using a massive amount of data and computational power, and is trained on a wide range of tasks, including language modeling, sentiment analysis, and text classification. The model is capable of generating coherent and contextually relevant text based on a given prompt, and can also understand and respond to natural language inputs[13].

While ChatGPT is a powerful tool with many potential applications, there are also some limitations to consider. For example, the model may generate biased or inappropriate responses if it is trained on biased or inappropriate data inputs. Additionally, the model may struggle with certain types of language tasks, such as understanding sarcasm or irony, or generating creative or nuanced responses. Nevertheless, ChatGPT represents a major breakthrough in the field of natural language processing, and has the potential to transform the way we interact with machines and communicate with each other[13].

The use of artificial intelligence (AI) in research has rapidly gained popularity in recent years, with AI-powered tools and technologies being used to analyze data, generate insights, and automate various aspects of the research process. One of the most

promising applications of AI in research is the use of language models, such as ChatGPT, to assist with writing and analyzing research papers. In this paper, we explore the potential benefits and limitations of using ChatGPT for research purposes, and discuss how this tool can be used to improve the quality and efficiency of research paper writing[13].

ChatGPT and other language models can be used in various ways to support research paper writing. For example, researchers can use these tools to generate outlines, abstracts, and summaries of their papers, or to assist with writing specific sections, such as the introduction or conclusion. Additionally, language models can be used to suggest alternative phrasings, correct grammar and spelling errors, and even provide feedback on the overall coherence and structure of the paper[13].

One of the key benefits of using ChatGPT for research paper writing is the increased productivity and efficiency it offers. By automating certain aspects of the writing process, researchers can save time and focus on the more creative and critical aspects of their work. Additionally, using language models can help researchers identify and correct errors and inconsistencies in their writing, leading to improved quality and clarity of their papers.

However, there are also limitations and challenges to consider when using AI-powered tools for research purposes. For example, the quality of the output generated by these tools depends heavily on the quality of the data inputs used to train the language models. Additionally, there is a risk of bias and errors if the data used to train the models is skewed or limited in some way. As such, researchers must be careful when using these tools and must take steps to ensure that the output generated by the language models is accurate and reliable[14].

ChatGPT and other language models represent a promising new tool for research paper writing and analysis[15]. By leveraging the power of AI, researchers can save time, improve the quality of their writing, and gain new insights into their research topics. However, it is important to carefully evaluate the benefits and limitations of using these tools, and to ensure that the output generated by the language models is accurate, unbiased, and relevant to the research goals.

3.1.1. Limitations of using ChatGPT:

Figure 2. Limitations of using ChatGPT

3.1.2. ChatGPT is a powerful language model that has revolutionized the field of natural language processing. However, like any technology, it has its limitations and challenges that researchers and developers must be aware of. Some of the key limitations of using ChatGPT include:

1. Data bias: ChatGPT is trained on large datasets of text, which may contain biases and inaccuracies that can be reflected in its output. For example, if the dataset used to train the model contains biased language or perspectives, the model may generate biased or inaccurate responses[10].
2. Lack of contextual understanding: While ChatGPT can generate coherent and contextually relevant responses based on a given prompt, it may struggle with understanding the broader context of a conversation or topic. This can lead to responses that are irrelevant or inaccurate, and may require significant post-processing or correction[10].
3. Lack of creativity: ChatGPT is designed to generate text based on patterns and correlations in its training data, and may struggle with generating truly original

or creative responses. This can limit its usefulness in certain applications, such as creative writing or artistic expression[10].

4. Limited domain expertise: ChatGPT is trained on a wide range of text data, but may lack specialized knowledge or expertise in certain domains or topics. This can limit its usefulness in research or industry applications that require specialized knowledge or terminology[10].
5. Ethical concerns: As with any AI technology, there are ethical concerns surrounding the use of ChatGPT and other language models. For example, the use of language models to generate fake news or manipulate public opinion is a growing concern, and requires careful consideration and oversight[10, 15].

In conclusion, while ChatGPT is a powerful and versatile language model, it is important to be aware of its limitations and challenges. By understanding these limitations and taking steps to mitigate them, researchers and developers can make the most of this powerful technology and unlock new possibilities in natural language processing and AI.

4. *WebChatGPT:*

WebChatGPT is an innovative plugin for ChatGPT that enables real-time information retrieval and reference generation during the research process. This powerful tool allows researchers to interact with the ChatGPT language model in a chat-like interface, providing them with immediate access to relevant information and insights[16]. By leveraging the power of natural language processing and deep learning, WebChatGPT can help researchers generate new ideas, refine existing research, and uncover hidden insights that may have otherwise gone unnoticed.

One of the key benefits of using WebChatGPT for research purposes is its ability to provide instant feedback and suggestions based on the researcher's input[17]. By understanding the context of the researcher's query and analyzing past research in the field, WebChatGPT can provide relevant information and insights that can help guide the research process. This can save researchers a significant amount of time and effort, as they no longer need to manually sift through vast amounts of information to find what they need[18].

WebChatGPT can also be used to generate references and citations in real-time, making it easy for researchers to track and organize their sources[19]. By leveraging the vast amount of data available to ChatGPT, WebChatGPT can provide researchers with a list of relevant sources, along with the necessary citation information, in a matter of seconds[20]. This can help researchers ensure the accuracy and completeness of their research, while also streamlining the citation process[21].

Overall, WebChatGPT represents a powerful new tool for researchers looking to leverage the latest advancements in natural language processing and deep learning[13]. By providing real-time information retrieval, reference generation, and feedback, WebChatGPT can help researchers save time, improve the quality of their work, and uncover new insights and ideas in their field of study[22].

4.1.1. Limitation of WebChatGPT:

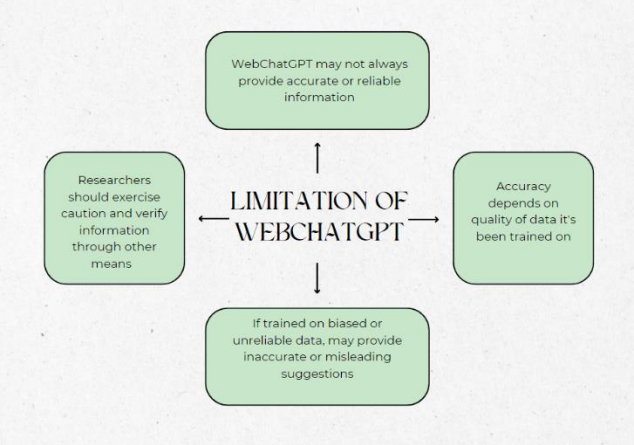

Figure 3. Limitations of WebChatGPT

4.1.2. **Limitations:**

One limitation of WebChatGPT is that it may not always provide accurate or reliable information, as the accuracy of the tool depends on the quality of the data that it has been trained on. If the tool has been trained on biased or unreliable data, it may provide inaccurate or misleading suggestions, which could negatively impact the quality of the research. Therefore, it is important for researchers to exercise caution when using WebChatGPT and to verify the accuracy of the information provided through other means.

5. *Shako AI*

Shako is a large language model developed by Panda Chat that is designed to assist users in generating responses to their inquiries. It is a tool that is capable of handling a wide range of parameters and can be used to generate responses to a wide range of inquiries, including those related to science, technology, and general knowledge[23].

There are currently two versions of Shako available: version 1.0 and version 1.1. Version 1.0 was released on Monday May 08, 2023, while version 1.1 was released on Tuesday May 09, 2023[24].

Shako is a general-purpose language model and is designed to be used as a tool to assist users in generating responses to a wide range of inquiries. It is capable of generating responses to a wide range of inquiries, including those related to numbers, dates, and time[25].

Shako is capable of handling a wide range of parameters and is designed to be a useful tool for users who need assistance in generating responses to their inquiries[26].

While Shako is a powerful tool, it does have some limitations. One of the limitations is that it is not able to handle complex inquiries that require a deep understanding of a subject. Additionally, while Shako is capable of generating responses to inquiries, it does not have the ability to understand the context or intent behind the inquiry[27].

Overall, Shako is a useful tool that has the potential to assist users in generating responses to a wide range of inquiries. It is a powerful tool that is capable of handling a wide range of parameters, and it is designed to be a useful tool for users who need assistance in generating responses to their inquiries[23].

Shako is a large language model developed by Panda Chat that is designed to assist users in generating responses to their inquiries. While it is primarily intended to be a tool for generating responses to inquiries, it is also be useful for research purposes.

5.1.1. **There are a few ways that Shako could potentially be used for research purposes:**

1. As a tool for generating research ideas: Shako may be able to generate research ideas by asking users to provide specific prompts or by analyzing existing data.
2. As a tool for generating research questions: Shako may be able to generate research questions by analyzing existing data or by asking users to provide specific prompts.
3. As a tool for generating research hypotheses: Shako may be able to generate research hypotheses by analyzing existing data or by asking users to provide specific prompts.
4. As a tool for generating research data: Shako may be able to generate research data by analyzing existing data or by asking users to provide specific prompts.

It is important to note that Shako is a tool that is designed to assist users in generating responses to their inquiries. It is not able to replace human judgment or to provide the same level of understanding or nuance as a human. Therefore, any research that is generated using Shako should be carefully reviewed and validated by a human expert to ensure its accuracy and reliability.

5.1.2. **Limitation of Shako AI:**

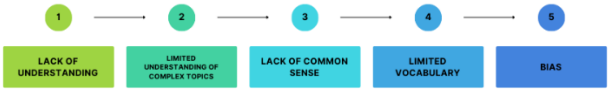

Figure 4. Limitations of ShakoAI

Shako is a large language model developed by Panda Chat, and like all AI tools, it has some limitations. Some of the limitations of Shako include:

1. Lack of understanding: Shako is not able to understand the context or intent behind the inquiry. It is only able to generate responses based on the parameters that it has been trained on.
2. Limited understanding of complex topics: Shako is not able to handle complex inquiries that require a deep understanding of a subject.
3. Lack of common sense: Shako does not have the ability to use common sense or to reason in the same way that humans do. This means that it may generate responses that are not appropriate or that do not make sense in certain situations.
4. Limited vocabulary: Shako has been trained on a limited vocabulary, and it may not be able to generate responses that include words that it has not been trained on.
5. Bias: Like all AI tools, Shako may exhibit bias in the responses that it generates. This is because it is based on the data that it has been trained on and may not be representative of all perspectives or experiences.

It is important to keep in mind that Shako is a tool that is designed to assist users in generating responses to their inquiries. It is not able to replace human judgment or to provide the same level of understanding or nuance as a human.

6. ***Promind AI:***

Promind is a large language model developed by Panda Chat that is designed to assist users in generating responses to their inquiries. It is a tool that is capable of handling a wide range of parameters and can be used to generate responses to a wide range of inquiries, including those related to science, technology, and general knowledge [28]. There is currently one version of Promind available. Promind is a general-purpose language model and is designed to be used as a tool to assist users in generating responses to a wide range of inquiries. It is capable of generating responses to a wide range of inquiries, including those related to numbers, dates, and time[29].

Promind is capable of handling a wide range of parameters and is designed to be a useful tool for users who need assistance in generating responses to their inquiries[30].

While Promind is a powerful tool, it does have some limitations. One of the limitations is that it is not able to handle complex inquiries that require a deep understanding of a subject. Additionally, while Promind is capable of generating responses to inquiries, it does not have the ability to understand the context or intent behind the inquiry[31].

Overall, Promind is a useful tool that has the potential to assist users in generating responses to a wide range of inquiries. It is a powerful tool that is capable of handling a wide range of parameters, and it is designed to be a useful tool for users who need assistance in generating responses to their inquiries[32].

Promind is a large language model developed by Panda Chat that is designed to assist users in generating responses to their inquiries. While it is primarily intended to be a tool for generating responses to inquiries, it is also be useful for research purposes[33].

1.1.1. **There are a few ways that Promind could potentially be used for research purposes:**

1. As a tool for generating research ideas: Promind may be able to generate research ideas by asking users to provide specific prompts or by analyzing existing data.
2. As a tool for generating research questions: Promind may be able to generate research questions by analyzing existing data or by asking users to provide specific prompts.
3. As a tool for generating research hypotheses: Promind may be able to generate research

hypotheses by analyzing existing data or by asking users to provide specific prompts.

4. As a tool for generating research data: Promind may be able to generate research data by analyzing existing data or by asking users to provide specific prompts.

It is important to note that Promind is a tool that is designed to assist users in generating responses to their inquiries[34, 35]. It is not able to replace human judgment or to provide the same level of understanding or nuance as a human. Therefore, any research that is generated using Promind should be carefully reviewed and validated by a human expert to ensure its accuracy and reliability[35].

6.1.2. How promind.ai works:

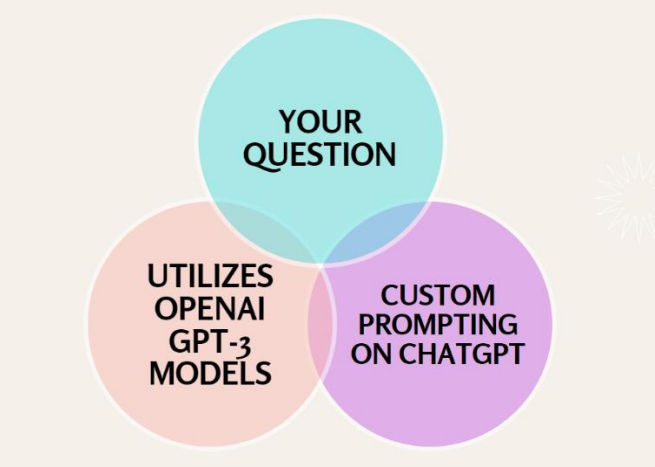

Figure 5. Limitations of Promind AI

6.1.3. limitation of promind.ai:

Promind is a large language model developed by Panda Chat, and like all AI tools, it has some limitations. Some of the limitations of Promind include:

1. Lack of understanding: Promind is not able to understand the context or intent behind the inquiry. It is only able to generate responses based on the parameters that it has been trained on.
2. Limited understanding of complex topics: Promind is not able to handle complex inquiries that require a deep understanding of a subject.
3. Lack of common sense: Promind does not have the ability to use common sense or to reason in the same way that humans do. This means that it may generate responses that are not appropriate or that do not make sense in certain situations.
4. Limited vocabulary: Promind has been trained on a limited vocabulary, and it may not be able to generate responses that include words that it has not been trained on.
5. Bias: Like all AI tools, Promind may exhibit bias in the responses that it generates. This is because it is based on the data that it has been trained on and may not be representative of all perspectives or experiences.

It is important to keep in mind that Promind is a tool that is designed to assist users in generating responses to their inquiries. It is not able to replace human judgment or to provide the same level of understanding or nuance as a human.

7. *Google Bard:*

Google Bard is a language model developed by Google. It is a beta version of Google's Colabortion platform, which is designed to help users collaborate on projects and to share ideas. Google Bard is a large language model that is trained on a wide range of text data, including books, articles, and websites. It is designed to be a useful tool for users who need assistance in generating responses to their inquiries[36, 37].

Google Bard has been in beta for several months, and it is expected to continue to be developed and refined by the Google team. It is available as a web-based tool, and it can be accessed by anyone with an internet connection.

Google Bard is a tool that is designed to assist users in generating responses to their inquiries. It can be used to generate a wide range of responses, including

answers to questions, summaries of articles, and even creative writing prompts[33, 38].

Google Bard is a tool that is capable of generating responses to a wide range of parameters. It is able to understand natural language input and can be used to generate responses to a variety of prompts and inquiries[39].

Google Bard is a powerful tool that has a number of limitations. One limitation is that it is still in beta and is being developed and refined by the Google team. As a result, it may not always be able to generate the most accurate or relevant responses. Additionally, because it is a large language model, it may generate responses that are not always appropriate or relevant to the user's inquiry. It is important to use Google Bard with care and to carefully review any responses it generates to ensure their accuracy and relevance[40, 41].

Google Bard is a language model that is designed to assist users in generating responses to their inquiries. While it is primarily intended to be a tool for generating responses to questions and inquiries, it may also be useful for research purposes[42].

7.1.1. **There are some ways that Google Bard could potentially be used for research purposes:**

1. As a tool for generating research ideas: Google Bard may be able to generate research ideas by asking users to provide specific prompts or by analyzing existing data[43].
2. As a tool for generating research questions: Google Bard may be able to generate research questions by analyzing existing data or by asking users to provide specific prompts[44].
3. As a tool for generating research hypotheses: Google Bard may be able to generate research hypotheses by analyzing existing data or by asking users to provide specific prompts.
4. As a tool for generating research data: Google Bard may be able to generate research data by analyzing existing data or by asking users to provide specific prompts.

7.1.2. **Graphical representation how bard can be used for research purpose:**

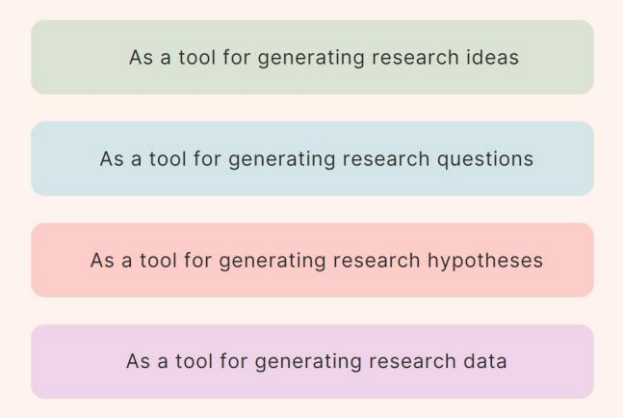

Figure 5. Bard use case for research paper witing purpose

It is important to note that Google Bard is a tool that is designed to assist users in generating responses to their inquiries. It is not able to replace human judgment or to provide the same level of understanding or nuance as a human. Therefore, any research that is generated using Google Bard should be carefully reviewed and validated by a human expert to ensure its accuracy and reliability.

7.1.3. **limitation of google bard:**

Google Bard is a powerful tool that has a number of limitations. Some of the key limitations of Google Bard include:

1. It is still in beta and is being developed and refined by the Google team. As a result, it may not always be able to generate the most accurate or relevant responses.
2. Because it is a large language model, it may generate responses that are not always appropriate or relevant to the user's inquiry. It is important to use Google Bard with care and to carefully review any responses it generates to ensure their accuracy and relevance.
3. Google Bard is a web-based tool and requires an internet connection to use.

4. Google Bard is not able to provide the same level of understanding or nuance as a human expert. Therefore, any research that is generated using Google Bard should be carefully reviewed and validated by a human expert to ensure its accuracy and reliability.
5. Google Bard is a tool that is designed to assist users in generating responses to their inquiries. It may not be able to handle complex or nuanced questions or inquiries as well as a human expert.
6. Google Bard is a language model, and as such, it may generate responses that are not always grammatically correct or well-formed. It is important to carefully review any responses generated by Google Bard to ensure their accuracy and clarity.

8. Methodology:

The development of artificial intelligence has revolutionized many fields, including research. In the past, research was conducted manually, which was time-consuming and had limitations in terms of accuracy and efficiency. However, with the emergence of AI-based tools such as ChatGPT, WebChatGPT, Shako AI, Promind AI, and Google Bard Beta, researchers can now conduct research more efficiently and accurately. In this paper, we will discuss how these AI-based tools can be used for research purposes.

9. *To use these AI-based tools for research purposes, researchers should follow a systematic methodology to ensure accuracy and efficiency. The following steps can be followed:*

1. Identify the research question or topic: The first step is to identify the research question or topic that the researcher wants to explore. This step is crucial because it will guide the use of AI-based tools and ensure that the research is focused and relevant.
2. Use ChatGPT and WebChatGPT to generate ideas and conduct literature reviews: Once the research question or topic has been identified, researchers can use ChatGPT and WebChatGPT to generate ideas and conduct literature reviews. They can input the research question or topic into these tools and review the responses generated by the AI-based tool. This step can help researchers identify potential gaps in the literature and generate ideas for further exploration.
3. Use Shako AI for data analysis and visualization: After conducting a literature review, researchers can use Shako AI for data analysis and visualization. They can input the data into Shako AI, which will analyze the data and identify patterns and trends. Shako AI can also create visualizations such as graphs and charts to help researchers communicate their findings more effectively.
4. Use Promind AI for writing assistance: Once the data has been analyzed and visualized, researchers can use Promind AI for writing assistance. They can input their research findings into Promind AI, which will analyze the text and suggest improvements in grammar, syntax, and style. Promind AI can also identify potential plagiarism and suggest citations to ensure that the research is original and properly cited.
5. Use Google Bard Beta for creative inspiration: In some cases, researchers may find it challenging to generate unique and creative perspectives on their research question or topic. In such cases, Google Bard Beta can be used to generate original poetry or prose that can inspire new and creative ideas for further exploration.
6. Evaluate and validate the results: After using these AI-based tools for research purposes, it is essential to evaluate and validate the results. Researchers should review the results generated by the tools to ensure that they are accurate and relevant to their research question or topic. They should also compare the results generated by the AI-based tools to other sources of information to validate their findings.
7. Refine the research question or topic: After reviewing the results generated by the AI-based tools and validating the findings, researchers may need to refine their research question or topic. This step can

help ensure that the research is focused and relevant to the research question or topic.

8. Repeat the process: Finally, researchers can repeat the process of using AI-based tools for research purposes as many times as necessary to achieve their research goals. They can refine their research question or topic, generate new ideas, conduct literature reviews, analyze and visualize data, receive writing assistance, and find creative inspiration using the AI-based tools discussed in this paper.

Overall, the use of AI-based tools for research purposes can help researchers save time, improve accuracy, and increase efficiency. By following a systematic methodology and using a combination of ChatGPT, WebChatGPT, Shako AI, Promind AI, and Google Bard Beta, researchers can conduct research more effectively and generate new insights that can contribute to their field of study. It is important to note, however, that the use of AI-based tools should not replace critical thinking and human judgment in research. Instead, they should be used as complementary tools to support and enhance the research process.

10. *Step by step process to perform with example:*

Let's consider this as an example: "What is the impact of social media on mental health among young adults?"

Step 1: Identify the research question or topic The first step is to identify the research question or topic. In this case, the research question is "What is the impact of social media on mental health among young adults?"

Step 2: Use ChatGPT and WebChatGPT to generate ideas and conduct literature reviews Researchers can input the research question into ChatGPT and WebChatGPT to generate ideas and conduct literature reviews. The AI-based tools can help identify relevant articles and studies related to the research question. Researchers can review the articles and studies to identify potential gaps in the literature and generate ideas for further exploration.

Step 3: Use Shako AI for data analysis and visualization After conducting a literature review, researchers can use Shako AI for data analysis and visualization. They can input the data from the articles and studies into Shako AI, which will analyze the data and identify patterns and trends. Shako AI can also create visualizations such as graphs and charts to help researchers communicate their findings more effectively.

Step 4: Use Promind AI for writing assistance Once the data has been analyzed and visualized, researchers can use Promind AI for writing assistance. They can input their research findings into Promind AI, which will analyze the text and suggest improvements in grammar, syntax, and style. Promind AI can also identify potential plagiarism and suggest citations to ensure that the research is original and properly cited.

Step 5: Use Google Bard Beta for creative inspiration In some cases, researchers may find it challenging to generate unique and creative perspectives on their research question or topic. In such cases, Google Bard Beta can be used to generate original poetry or prose that can inspire new and creative ideas for further exploration.

Step 6: Evaluate and validate the results After using these AI-based tools for research purposes, it is essential to evaluate and validate the results. Researchers should review the results generated by the tools to ensure that they are accurate and relevant to their research question or topic. They should also compare the results generated by the AI-based tools to other sources of information to validate their findings.

In summary, this methodology can help researchers conduct research more efficiently and accurately. By using AI-based tools, researchers can generate ideas, conduct literature reviews, analyze data, improve writing, and find creative inspiration. The

methodology can be applied to a wide range of research questions and topics, including social media's impact on mental health among young adults.

11. Conclusion:

The use of AI-based tools such as ChatGPT, WebChatGPT, Shako AI, Promind AI, and Google Bard Beta can revolutionize the research process. These tools can help researchers generate ideas, conduct literature reviews, analyze data, and improve the writing process. However, it is essential to follow a systematic methodology to ensure accuracy and efficiency in using these tools. While these tools can be powerful and useful, they should not replace the human aspect of research, such as critical thinking and analysis. Researchers should use these tools to augment their research process and not replace it entirely.

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