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The opportunities and challenges of ChatGPT in education

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ABSTRACT

The launch of OpenAI ChatGPT's language-generation model has raised alarms within many sectors, especially the academic sector. Several academicians have urged universities to develop new forms of assessment after the launch of ChatGPT, which solves academic questions in less than a few minutes. Academic cheating is not a new phenomenon, and the use of AI-generated text to cheat on assignments is a new type of cheating that poses unique challenges. This study used the Latent Dirichlet Allocation (LDA) method for topic modeling and the Valence Aware Dictionary for Sentiment Reasoning (VADER) method for sentiment analysis. After data preprocessing, 3870 tweets were still available out of the originally 10,000 tweets that were extracted for the study. The VADER sentiment analysis results revealed that 2013 tweets were categorized as "positive," with the remaining 804 and 1053 tweets categorized as "negative" and "neutral." The analysis's findings indicate that the majority of people have favorable things to say about ChatGPT. As a result, educational institutions can mitigate the disruptive effects of this technology and promote academic integrity by developing clear policies and guidelines and designing assessments that include limited AI-generated text.

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ChatGPT; AI; university; cheating; plagiarism

1. Introduction

The latest advancements in deep machine learning have resulted in platforms that can generate text that mimics human writing. A rising variety of content writers with AI capabilities are available, including Rytr, Jasper, ChatGPT, and CopyAI. ChatGPT is currently the most impressive of these platforms, and its user-friendly interface has led to a large number of users in a short period of time (Gleason, 2022). What makes ChatGPT unique is its ability to produce high-quality text for a wide range of applications, its ongoing learning capabilities, and the fact that it is free to use. The chat format of the platform also makes it interactive and easy to use for people with different levels of technical expertise. ChatGPT is a pre-trained language model developed by OpenAI. It is based on the GPT (Generative Pre-trained Transformer) architecture and is fine-tuned for conversational AI tasks such as question answering, text generation, and dialogue systems (OpenAI, 2023). According to OpenAI (2023) the model is trained on a massive amount of internet text data and is able to generate human-like text. It uses a transformer architecture, which is a type of neural network architecture that allows for parallel processing of data, making it well-suited for natural language processing tasks. ChatGPT is fine-tuned on conversational data by running it through a specific task such as answering questions or generating responses in a dialogue system. This fine-tuning process allows the model to learn the specific nuances and patterns of conversational language, making it

more effective at generating human-like responses. In addition to its ability to generate text, ChatGPT also has the ability to understand and interpret the meaning of text, making it useful for a wide range of natural language processing tasks. It can be used in various applications such as customer service chatbots, virtual assistants, or voice-enabled devices. It's also used for generating text in creative writing, language translation and summarization. Predominantly, ChatGPT is a powerful language model that can be fine-tuned for a variety of conversational AI tasks and can generate human-like text (OpenAI, 2023). According to Gleason (2022) using a paper produced by ChatGPT is quick, and cannot be identified as plagiarized, it differs from hiring a ghostwriter. The work's artificial intelligence (AI) authorship can be difficult to demonstrate, and there are no effective defenses at this time. Furthermore, students' usage of this software raises concerns about the validity of their learning and the fairness of their assessments. The use of this technology poses a threat to efforts to develop assessments that are more inclusive and genuine. As it is expected that students will use this technology in the industry after graduation, colleges must create tests that contain AI-generated material in order to ensure fairness and diversity. This article offers valuable insights into ChatGPT, including its potential impact on student cheating, the challenges and opportunities it presents, and the efforts to address its disruptive nature. It also examines the implications of ChatGPT on academic integrity for both students and faculty members. Overall, the article contributes to the existing literature on learning and provides a comprehensive understanding of ChatGPT and its effects.

2. Literature

Academic cheating is not a novel phenomenon; it has been present in educational institutions for centuries (Ghiațău, 2021; Hinduja & Patchin, 2008; Mokdad & Aljunaidi, 2021). From plagiarism to cheating on exams, students have always found ways to gain an unfair advantage over their peers (Rowe, 2004). The advent of technology has brought about new forms of cheating, such as the use of mobile phones during exams and the sharing of answers on online platforms (Ma et al., 2008; Sheard et al., 2002). However, the most recent technological development that has raised concerns about cheating is the use of AI-generated text, specifically, the use of ChatGPT and GPT-3.5 to write essays and other assignments (Pavlik, 2023; Susnjak, 2022). The use of AI-generated text to cheat on assignments presents a unique problem to educators because it is challenging to detect material that has been generated by the AI, unlike more typical types of cheating like plagiarism (Aydın & Karaarslan, 2022; Frye, 2022). This is due to the fact that assignment solution generated by the AI is frequently difficult to tell apart from solutions authored by a human. Furthermore, there are fewer known defenses that can identify text produced by AI. The legitimacy of evaluations and the fairness of grading are further issues that are brought up by the use of AI-generated material. Therefore, students are not being evaluated on their own skills and knowledge if they submit solutions that were generated by AI rather than ones that they solve themselves. According to Susnjak (2022), this undermines academic integrity and devalues the education system, and the use of AI-generated text may prevent students from improving their own writing skills and critical-thinking skills. Additionally, students might not feel the need to develop their own talents if they can just employ AI to do their assignments or projects. It's crucial to remember that using AI-generated solutions is not just limited to cheating because this could have a negative impact on education generally.

2.1. Usages of ChatGPT

When ChatGPT was first launched, there were concerns about its usage for writing essays before many realized that it could also be used for writing computer code, which goes beyond just writing essays. This makes ChatGPT a much more potent and disruptive tool, which emphasizes how crucial it is for students to understand how to interact with it securely (Lipman & Distler,

2023). Additionally, there are worries that AI-generated essays may be tough for plagiarism detection software to detect, making it challenging for teachers to spot and manage cases of cheating. It's critical to remember that this technology is novel and emerging and that the worries are legitimate. According to Callahan (2023) employees are reportedly adopting ChatGPT to boost their productivity in some way and workers in a range of industries, including marketing and education are making use of the ChatGPT. Furthermore, CTVNewsOttawa.ca's experiment, reported that 34% of the 268 participants chose the ChatGPT authored (Example A) as being written by a human, whereas 59% correctly identified Example B as being written by a human. And finally, 7% stated they couldn't tell.

The few known usages of ChatGPT are in the domain of building chatbots for customer care, e-commerce, language generation, paraphrasing, code generation, code debugging, text summarization, story generation, and poetry generation. Additionally, ChatGPT is helpful in language translation applications because of its capacity to comprehend and produce content in numerous languages. Overall, ChatGPT is a potent tool for natural language processing (NLP) tasks, and more programmers and researchers are discovering creative uses for it in their work (Barari & Kumar, 2023).

2.2. Challenges

ChatGPT has made it more obvious that the educational system is vulnerable to outside threats (Bozkurt & Sharma, 2020). ChatGPT and other chatbots could be used to cheat on examinations or finish assignments without really performing the work because they can provide responses on demand. It not only compromises the integrity of the educational system but also disadvantages pupils who do not have access to these resources when the instructors weren't aware of the usage of the platform rating those who use it higher. Furthermore, higher education is now far more competitive than it ever was, just like any other industry. Similar programs and cost structures are offered by a much greater number of universities and colleges. Given the circumstances, institutions must now go above and beyond to identify what makes them special and create a compelling brand statement. They must also make sure that potential students are aware of the benefits of enrolling with them. Many universities are in support of AI in education and while some are against it. Therefore, there is still no general consensus on the usage of AI in higher education. Adam Stevens claims that ChatGPT is only dangerous if our educational system is "pursuing rubric points and not knowledge." It is crucial that all educators emulate their peers' behavior (Hirsh-Pasek & Blinkoff, 2023).

2.3. Will AI takes over teacher's role?

AI systems have the potential to be unfriendly and might not be capable of engaging students in the exact way that a conventional teacher does. Therefore, maintaining the attention and motivation of the students can be difficult in this situation. Using artificial intelligence (AI) in education presents a number of difficulties in terms of student participation (Zhai, 2022). These difficulties include:

1. **Artificial Intelligence's Impersonal Nature:** Some students could believe that AI systems are emotionless and are less engaged in them than a conventional teacher would've been.
2. **Lack of Interpersonal Interactions:** Some learners might not feel as motivated or engaged when learning from an AI system. Instead, they might favor the interpersonal interaction and assistance provided by their teacher.
3. **Barriers to Technology:** It's possible that some students lack the gadgets or internet connections needed to use AI systems, which may have an impact on how they interact with the platforms.

In a future where AI will play a significant role, it is essential to have proper education for humans, and it's quite important for educators to understand that they will be working alongside machines. For example, having a basic understanding of programming will help students interact and work efficiently with AI. Furthermore, not all people benefit from change. The metaverse, quantum computing, ChatGPT, and other cutting-edge technologies will have unforeseen and detrimental effects on people, businesses, and economies.

2.4. Socio-economic factors of ChatGPT

ChatGPT and other language models' socio-economic variables are nuanced and multidimensional. The following are some possible socioeconomic effects of ChatGPT:

1. **Job Displacement:** Every conversation on AI appears to eventually veer toward the subject of job losses and the continued necessity of human labor in the face of universal computer capability. As language models become more competent of carrying out tasks currently completed by people, there is a chance that they will eliminate jobs in several sectors, like language translation and customer support.
2. **Information Accessibility:** ChatGPT and other language models can also help users have easier access to content by producing text in different languages and simplifying complex information. People with inadequate literacy skills or those who speak lesser-known languages may particularly benefit from this.
3. **Impact of ChatGPT on Education:** ChatGPT has the potential to be an effective educational tool, but there are also significant difficulties that must be taken into account. A decline in the demand for human educators, for instance, could have a detrimental effect on the employment market if language models are used to create instructional content.
4. **Discrimination and Bias:** If the training data used to train a linguistic model contains biases, the model's output may also be skewed. This has the potential to reinforce already prevalent biases and discrimination in society.
5. **Impact of ChatGPT on Language:** As language models progress, they may alter how people speak and write, altering the nature of language and how it is employed.

ChatGPT and other language models' socio-economic components are complex and multifaceted, therefore it's important to consider both their potential advantages and disadvantages when evaluating their application.

2.5. Digital competence

The idea of "digital competence" has emerged as a central one in the debate over the knowledge-based skills and knowledge that individuals should possess. It has roots in the economic competition where new technology is seen as an opportunity and a solution, and is essentially a political notion that reflects beliefs and even aspirations about future demands (Ilomäki et al., 2011). According to the broadest and most up-to-date definitions, which are based on papers and studies relevant to policy, digital competence includes not only technical knowledge of digital devices but also social and emotional aspects of utilizing and comprehending them (Oberländer et al., 2020; Sánchez-Caballé et al., 2020; Zhao et al., 2021). In order to properly connect with ChatGPT and obtain pertinent and correct information, one must be skilled at navigating and engaging with the tool's interface, understanding its capabilities and constraints, and using it. It also entails being conscious of moral issues when utilizing the model, such as bias and privacy. Therefore, the proper use of ChatGPT may be overlooked by students and instructors with limited digital competency. One of the authors queried ChatGPT to generate a regular expression (Regex), and ChatGPT gave a brief explanation or suggestion about regular expressions and says it cannot generate it as shown in Figure 1. Furthermore,



Can ChatGPT generate regular expression



ChatGPT is a natural language processing model, it is not specifically designed to generate regular expressions, which are a type of formal language used to match patterns in text data. However, it's possible to use ChatGPT in conjunction with other tools to generate regular expressions.



For example, you could use ChatGPT to generate natural language descriptions of the desired pattern, and then use another tool to convert that description into a regular expression. This would require additional steps and also a proper understanding of regular expressions and how to convert natural language to regular expressions.

Another option could be to use ChatGPT to generate natural language examples of the desired pattern, and then use those examples to manually create a regular expression.

Overall, ChatGPT can be a useful tool for generating natural language descriptions of text patterns, but it is not designed specifically to generate regular expressions, and therefore it might not be the most efficient tool to generate them.

Figure 1. Regular expression question on ChatGPT.

the author asked ChatGPT, which claimed that he couldn't generate regex, to generate a regular expression for a password, and it was provided as shown in [Figure 2](#). This reveals that ChatGPT is capable of many things, but the user must get the query right for it to produce the answer.



regex for alphanumeric password with special characters and a minimum of 15 characters in total



A regular expression (regex) for an alphanumeric password with special characters and a minimum of 15 characters in total could be:



```
^(?=.*[A-Za-z])(?=.*\d)(?=.*[@$!%#?&])[A-Za-z\d@$!%*#?&]{15,}$
```

This regex uses several positive lookahead assertions to ensure that the password:

- Contains at least one letter (`(?=.*[A-Za-z])`)
- Contains at least one number (`(?=.*\d)`)
- Contains at least one special character (`(?=.*[@$!%#?&])`)
- has a minimum length of 15 characters

The caret (^) at the start of the regex asserts that the string must start with the pattern, and the dollar sign (\$) at the end asserts that it must end with the pattern. The {15,} following the pattern asserts that it must be repeated a minimum of 15 times.

Note: This is just one example of a regex that can be used for this purpose, there might be other regex that can also match the same requirements.

Figure 2. ChatGPT response to Password Regex Query.

2.6. Opportunities

Several years ago, the world confronted a situation using the phrase “social media,” and a definition was developed to clarify what should be included in this nebulous concept and how it varies from similar ones like Web 2.0 and user-generated content. When social media was first introduced, it was described as “a series of internet-based applications that build on the theoretical and technological foundations of Web 2.0 and that enable the creation and exchange of user-generated content” (Kaplan & Haenlein, 2010). The same problem exists in terms of Artificial Intelligence (AI) today and how it relates to ideas like big data and the Internet of Things (IoT). As a result, Kaplan and Haenlein (2019) describe AI as “a system’s capacity to correctly read external input, to learn from such data, and to employ those learnings to accomplish specific goals and tasks through flexible adaptation”. Lee (2019) asserts that the Internet of Things (IoT) has the potential to revolutionize how we live, work, conduct business, and serve the needs of the general population. Furthermore, Saarikko et al. (2017) stated that IoT is one technique of obtaining the outside data required as an input for AI. Additionally, AI relies on concepts from machine learning, which explains ways that enable computers learn without being explicitly programmed, to find underlying principles and patterns using external information received from IoT or other large data sources as an input. A machine learning approach is used by ChatGPT, an artificial intelligence (AI) model, to comprehend and produce natural language writing. It is a subset of the GPT (Generative Pre-trained Transformer) model, a language model based on transformers that was developed using a substantial corpus of text data. ChatGPT is well-suited for tasks like generating chatbot responses, producing interactive stories, and more since it is specifically optimized for conversational and interactive text production. As a cutting-edge language generation model, ChatGPT offers a variety of opportunities. Several examples include:

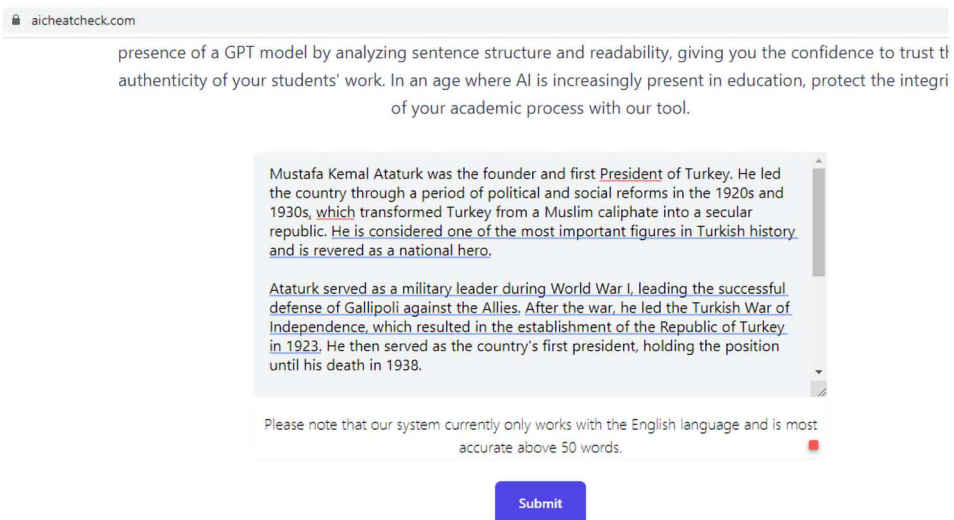
1. **Natural Language Processing (NLP):** NLP tasks like sentiment analysis, text summarization, and language translation can all be improved with ChatGPT.
2. **Content Generation:** For corporations and organizations, ChatGPT may be used to produce high-quality content such as blog posts, social media updates, and chatbot responses, which can help them save time and money.
3. **Virtual Assistants:** A more practical and effective method of accessing information is possible with the help of ChatGPT, which can be used to create intelligent virtual assistants that can comprehend and reply to natural language questions.
4. **Education and Research:** The development of educational tools that can enhance learning outcomes and NLP and AI research can both be facilitated by ChatGPT.
5. **Entertainment:** With the use of ChatGPT, interactive narratives, video games, and other entertainment may be made that respond to user input in conversational language.
6. **Code Explanation and Comments:** ChatGPT has the capability to explain programming language code and apply line-by-line comments in the code.
7. **Write Test Cases:** ChatGPT is capable of generating test cases for a variety of scenarios. You can even specify which framework, version, and so on you want to be used.
8. **Write Documentation:** You can request that ChatGPT write documentation on topics such as the packages required for a code, what the code does, and what known limitations exist.
9. **Generate Regular Expressions:** Regexes are one of those specialized syntaxes that we only use on occasion. Every time we need one, we have to Google it, look it up, and spend a significant amount of time doing so. ChatGPT can generate a correct regular expression in less than 2 min.
10. **Code Correction, Merging, Conversion and Styling:** ChatGPT can rewrite a code in any language given, correct errors, find bugs, and merge code faster and more accurate with explanation of the code syntax conversions.

The opportunities that ChatGPT’s natural language comprehension skills provide can be applied in a variety of fields to increase productivity, automate processes, and open up new opportunities.

2.7. GPTZero and AICheatCheck

In order to identify AI, GPTZero (<https://gptzero.me/>) uses similar technologies that were utilized to create ChatGPT and it tracks AI involvement in words using elements like perplexity. A statistical indicator of how reliably a language model predicts a text sample is called perplexity. It measures how “surprised” the model is when it encounters new data. The model predicts the text more accurately the lower the perplexity. Since complexity doesn’t quantify correctness, it is inappropriate for ultimate NLP evaluation. A model could be modest in complexity but have a high error rate. In other words, a model’s confidence in its predictions does not necessarily imply that they are accurate. Perplexity should only be used as a first assessment because of the limitation. After using perplexity to focus your models, you should assess them using other metrics. According to Ghani (2023), with some degree of reliability, GPTZero recognized longer texts created by ChatGPT for general lexical knowledge. Short text recognition, on the other hand, failed. According to GPTZero, texts with lower perplexities are more likely to be produced by language models. As a result, GPTZero cannot effectively and accurately evaluate short text or detect ChatGPT text.

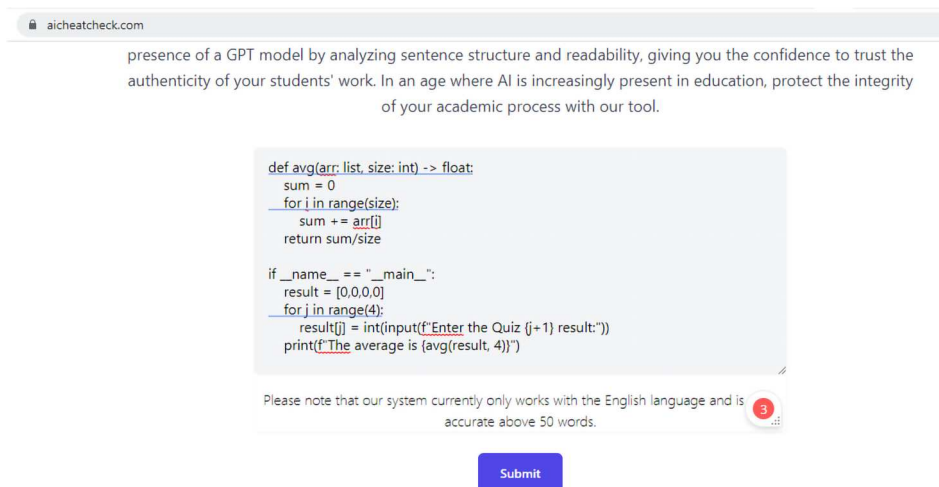
Another tool developed to combat ChatGPT is called AICheatCheck (<https://www.aicheatcheck.com>). It seeks to properly identify the presence of a GPT model by examining sentence structure and readability, providing you the assurance to believe that the work of your pupils is legitimate. Many users paste content into AICheatCheck, which makes use of its own AI models to determine if the content was produced by a human or a machine based on cues like word choice and sentence structure. However, they failed to remember that the models were trained on data that was labeled either “human generated” or “AI generated” to detect the presence of a GPT model by analyzing sentence structure and readability (Bennett, 2023). This was done in an effort to prevent their text from being detected or being flagged for plagiarism. One of the authors tested the AICheatCheck with the text generated from ChatGPT, as shown in Figure 3, and it was revealed that the text was 99.98% generated by an AI. Furthermore, a programming code generated from ChatGPT, as shown in Figure 4, was tested, and AICheatCheck detected that it was 77.99% written by AI. It was later tested with author-typed code, and the result came out at 78.54%, and another “love message” composed by the author, as shown in Figure 5, was detected to be 99.56% written by



The screenshot shows the AICheatCheck website interface. At the top, the URL 'aicheatcheck.com' is visible. Below the header, a paragraph describes the tool's purpose: 'presence of a GPT model by analyzing sentence structure and readability, giving you the confidence to trust the authenticity of your students' work. In an age where AI is increasingly present in education, protect the integrity of your academic process with our tool.' A text input area contains two paragraphs of text about Mustafa Kemal Ataturk. Below the input area, a message states: 'Please note that our system currently only works with the English language and is most accurate above 50 words.' At the bottom, there is a blue 'Submit' button.

99.98% certain the text was written by an AI

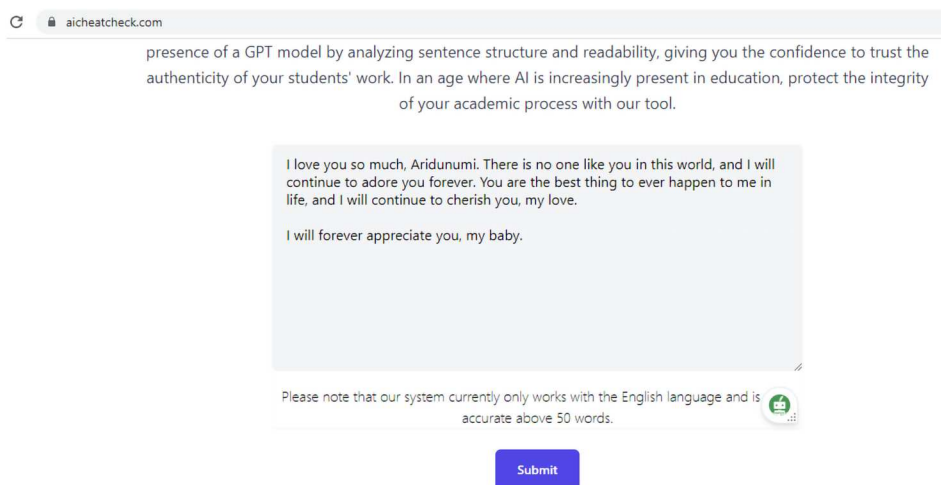
Figure 3. Text generated by ChatGPT checked on AICheatCheck.



77.99% certain the text was written by an AI

Figure 4. Code generated by ChatGPT checked on AIHeatCheck.

an AI. The author checked for the same message using another computer, and the result came out to be 98.53%. The testing algorithm of AIHeatCheck is not transparent enough to let users know how it detects whether the message was compiled by AI or composed by humans. However, it seems AIHeatCheck logged the IP after the first checked of text and considered further text to be generated by an AI as well. These scenarios reveal that AIHeatCheck is not accurate in differentiating AI-generated text or code from human-typed text or code. Furthermore, AIHeatCheck is limited to only the English language, whereas ChatGPT covers many languages.



99.56% certain the text was written by an AI

Grade Level: Text too short for accurate grade level

Figure 5. Message composed by author checked on AIHeatCheck.

2.8. What is the world saying about ChatGPT?

Social media posts are being analyzed by researchers today in order to attain or forecast results. Social media is a fantastic tool for expressing feelings, thoughts, and viewpoints. One of the most popular social networking sites in the world, Twitter allows users to express whatever is on their mind. According to Dixon (2023), there are about 196.3 million daily active users on Twitter, and there can be up to 500 million tweets posted each day (Cureg et al., 2019). Twitter gives users the chance to quickly and honestly express themselves. This is distinct from conventional face-to-face interviews where the respondent's reaction could be impacted by the anxiety caused by the actual interaction between the interviewer and respondent (Guo & Li, 2019). Twitter is a fantastic site to use for this because people can easily express themselves honestly when they're alone, which makes it useful for determining the true public attitude (Guo & Li, 2019). It is appropriate for research projects that call for opinion analysis because users can freely share their location, remarks, thoughts, and sentiments, albeit within a 280-character limit. Additionally, since Twitter's application programming interface (API) and database access are open to the general public, data collection is not a daunting task in this study. Since ChatGPT's introduction, different industries have had different perspectives on its use; some see it as a boon, while others consider it as disruptive technology. This study will close this gap by offering a sentiment analysis and identifying subjects through an examination of the tweets with the hashtag "ChatGPT." RapidMiner (RM) Studio is used in the study to collect and analyze data from Twitter. RM is a collection of data science software tools that comprises modeling operators, machine learning, and data preprocessing techniques. In RM, natural language processing (NLP) techniques such as case transformations, text categorization, stemming, stop word deletion, and others are available. These preprocessing technologies look for connections between words that have meaning and determine what a sentence means.

3. Method

The RM "Search Twitter" and "Write Excel" operators was used to extract the data, and only English-language tweets were included in the search. Tweets that were relevant to the search were found using the phrase "ChatGPT." The "recent or popular" 10,000 tweets were collected from the period of 14 January 2023 to 17 January 2023. RapidMiner retrieved 10,000 tweets within a period of 3 days. By filtering out tweets with the word "RT" in the body of the article, the researchers eliminated extraneous data, including duplicate and retweeted tweets, using the "Remove Duplicates and Filtering" function in RM. These procedures were used to streamline the data collection procedure and eliminate down on unnecessary information. There were 3,870 tweets left, and they were all saved in an Excel document. Furthermore, the use of various NLP pre-processing techniques followed next. This procedure was crucial in getting the data ready for the next step, which involved performing a sentiment analysis with the Valence Aware Dictionary for Sentiment Reasoning (VADER) which is a model used for text sentiment analysis that is sensitive to both polarity (positive/negative) and intensity (strength) of emotion. Lastly, Latent Dirichlet Allocation (LDA) modeling was used to categorize the data.

This study examined the VADER sentiment scores on English-only tweets. The researcher calculated the sentiment of each tweet and then separated the data into three distinct categories: good, negative, and neutral. **3870** English tweets in total were included in the investigation; **2013** of those tweets were labeled as "positive," while the rest **804** and **1053** were characterized as "negative" and "neutral," respectively. The world cloud of the top 50 words compiled using RapidMiner is shown in Figure 6. Furthermore, the distribution of the various sentiment categories is seen in Figure 7, and sample tweets are shown in Table 1. The use of ChatGPT is on the rise, as evidenced by the frequency of the top six terms listed in Table 2 and the favorable attitudes depicted in Figure 7.

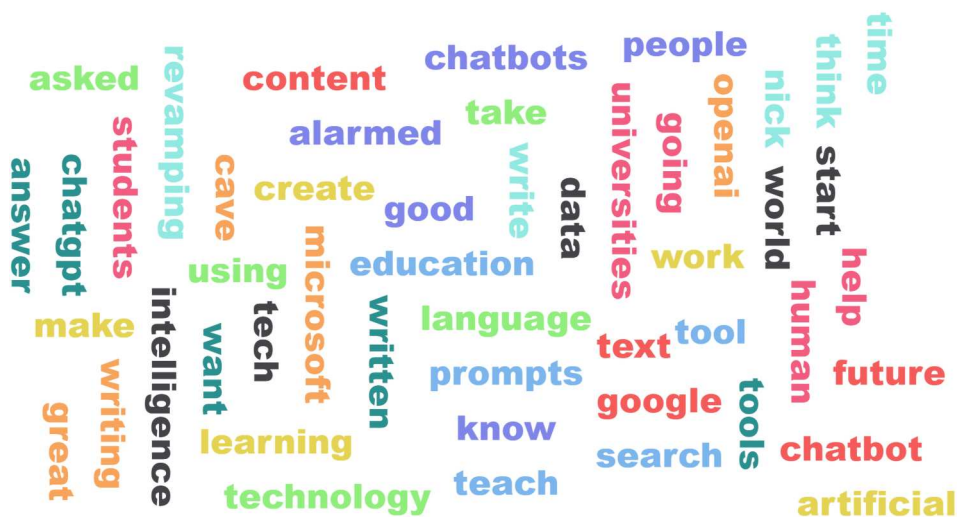


Figure 6. World cloud of top 50 words. Source: Authors compilation with RapidMiner.

LDA is a topic model that is used to assign text in a document to a specific topic. It creates a topic per document model and a word per topic model using Dirichlet distributions. We adopted LDA topic modeling via Rapid Minder to analyze the topics hidden in the ChatGPT tweets. Table 3 shows six topics and five keywords identified from the outcomes of the analysis.

4. Discussion

The analysis’s findings indicate that the majority of people on Twitter have favorable things to say about ChatGPT. The good feedback is a result of people using ChatGPT during this time to quickly

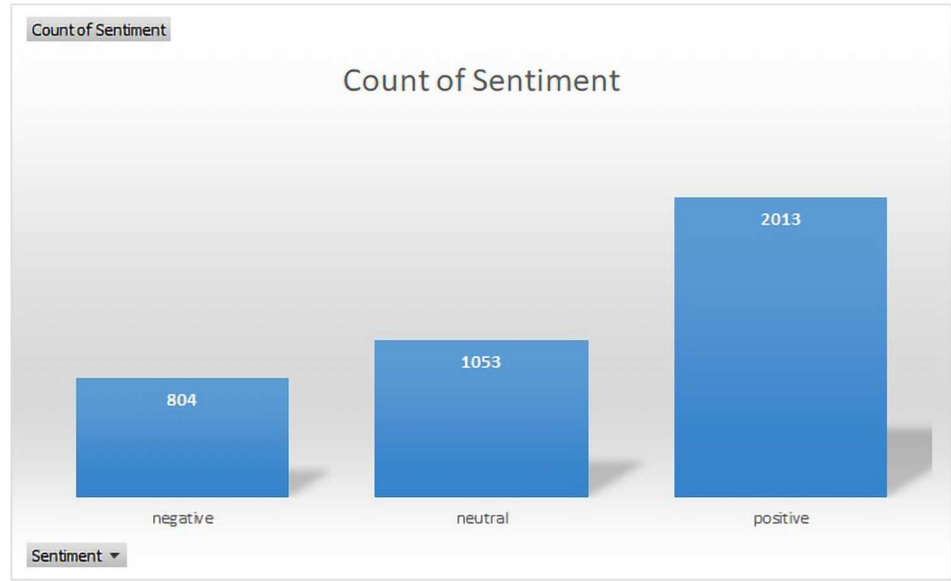


Figure 7. Vader sentiment output. Source: Authors compilation.

Table 1. Featured tweets and sentiments.

Selected tweets	Sentiment
1. <i>"The only teaching problem would be not noticing that an essay was more polished than expected and asking the student. Cheating is rampant and ChatGPT can produce intelligent-sounding if not original essays."</i>	Negative
2. <i>"Hackers are trying to get the worst out of #ChatGPT – Crooks are discussing bypassing protections using ChatGPT."</i>	
3. <i>"Who would be willing to add a tab to their written articles that states 'this article written by a human without any AI assistance'."</i>	
4. <i>"ChatGPT: Everything You Need to Know."</i>	Neutral
5. <i>"ChatGPT is basically a plagiarism bot. Impressive but not 'intelligent'."</i>	
6. <i>"The chatGPT will be a defining moment in Education, like no other technology including the computer or the internet, not for what it currently represents, but for what it represents as a starting point for what's next"</i>	
	Positive

Source: Authors compilation with RapidMiner.

Table 2. Top 6 occurring words.

Word	Document occurrences	Total occurrences	Accuracy rate (%)
Chatgpt	3576	3996	89.4
Using	262	272	96.3
Openai	232	246	94.3
Write	209	224	93.3
Universities	149	152	98.0
Help	120	126	95.2

Source: Authors compilation with RapidMiner.

solve problems that ordinarily would take them days or weeks to complete. Therefore, it is crucial that educational institutions provide explicit norms and standards surrounding the usage of AI-generated material in order to address the problem of academic cheating. These regulations should give guidelines on how to use AI-generated material in a way that promotes learning, as well as a clear explanation of the penalties for cheating. Furthermore, creating assessment techniques that take limited AI-generated text into account is another crucial step, and to achieve this, students can be given tasks to analyze and evaluate text produced by AI, or AI-generated text can be incorporated into the assessment process in a way that promotes learning. Several organizations are investing heavily in the AI-generated chatbot and its countermeasure, and students should not be left out as part of the research teams to find a solution to mitigate the negative aspects of its usage (Callahan, 2023; Chechitelli, 2023; Seeber et al., 2020). Academic cheating, on the other hand, is not a new phenomenon, and the use of AI-generated text to cheat on assignments is a new type of cheating that poses unique challenges. As a result, educational institutions can mitigate the disruptive effects of this technology and promote academic integrity by developing clear policies and guidelines and designing assessments that include limited AI-generated text.

Today's students are all "native speakers" of the digital language of computers and the Internet. According to Vuleta (2023) some digital natives spend more than six hours a day glued to their screens, which is excessive. Information overload and digital natives are growing issues in both the workplace and in everyday life (Liu et al., 2021). When you try to make sense of more information than you are able to comprehend, you are experiencing information overload. Either you put off

Table 3. LDA topics and keywords.

Topic	#0: ChatGPT skill	#1: ChatGPT in education	#2: Artificial intelligence	#3: Answer and plagiarism	#4: Machine learning	#5: Generate data
1	Light	ChatGPT	ChatGPT	ChatGPT	ChatGPT	ChatGPT
2	Skill	Students	Intelligence	Answer	Hackers	Data
3	Oracle	Essays	Artificial	Plagiarism	MachineLearning	Generate
4	OpenAI	Education	DeepMind	Teach	Worst	Information
5	ChatGPT	Student	Rival	Universities	Training	Content

Source: Authors compilation with RapidMiner.

making decisions or you make the wrong ones as a result. Now in the era of ChatGPT, the students might not be affected by information overload like before, but their cognitive reasoning will drop drastically as they rely on the AI to solve problems for which they should naturally think of solutions. To address these challenges and promote student engagement, there are several potential solutions that can be implemented, including: First, higher education institutions must ensure that the public AI systems accessible to students are designed to be engaging and interactive, incorporating elements such as games and simulations to increase student interest. Second, the platforms must leave spots for students to interact with human teachers and mentors in addition to using AI systems. Third, support systems and resources from higher institutions must be provided for students who may be experiencing technological barriers. Fourth, the digital natives should encourage to take an active role in their learning and providing them with choices and opportunities to personalize their learning experiences. Lastly, getting feedback from students and using this feedback to improve the design and implementation of AI systems will contribute to the good usage of AI in education.

Artificial intelligence (AI) can automate many administrative tasks in the field of education, including enrollment and registration, student data management, grading and evaluation, course scheduling, and financial aid. Nevertheless, using automation and AI to automate administrative tasks in education has the potential to significantly improve the efficiency and effectiveness of the educational system by allowing administrators and educators to focus on the main goal of education and by providing students with a more seamless and effective learning experience (Zhai, 2022). Therefore, rather than replacing the work of educators and administrators, automation should be used as a tool to augment and assist it. It is critical to keep in mind that it cannot replace human discretion and knowledge. In general, while utilizing AI in education, it is crucial to carefully analyze the requirements and concerns of students. Then, it is equally necessary to put the right measures in place to answer these demands and encourage student engagement.

5. Conclusion

The objective of this research was to investigate the opportunities and challenges of ChatGPT in Education. The input of the people was not excluded after we carefully examined the use of ChatGPT, challenges, opportunities, and other AI tools to detect ChatGPT-generated results. The sentiment analysis reveals that people have a more positive viewpoint of ChatGPT, and the use of it is not going to slow down in the years to come. Therefore, higher education must look into positive ways in which ChatGPT will be integrated into the university curriculum without affecting the cognitive reasoning of the students. However, there are a few limitations to this study. The data extracted from Twitter is the general opinion of a heterogeneous audience. Although the tweets are considered sincere opinions that weren't influenced by anyone because they expressed how they felt about ChatGPT. Secondly, the experiments were conducted on the ChatGPT free platform using GPT-3 (Generative Pre-trained Transformer 3), and future research should consider a higher version. In addition, future studies should narrow the sample size down to a specific population and consider mixed-methods research to investigate the influence of ChatGPT on students' engagement.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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