

Ethical Analysis of ChatGPT in Academia

Via Surveys

Joseph Carvalho, Hameez Iqbal, Alan Pangnathip and Kyle Teopiz

Department of Computer Science, Toronto Metropolitan University

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Dr. Omar Falou

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Table of Contents

Table of Contents	2
Introduction	3
History	3
Methodology	3
Survey Data	4
Benefits	5
Limitations	5
Future	6
Conclusion	7
Appendix	8
Screenshot of Survey	8
Is ChatGPT ethical based on Academia groups	11
Survey Improvements	12
Improvement of Methodology	12
Calculation of Sample Size	13
Possible New Questions	15
Analysis of the 5 Theories with respect to ChatGPT use in Academia	16
Hameez's Limitation Experiment	17
Bibliography	18

Introduction

Artificial intelligence has always been a controversial topic. In the world of academia, notoriety goes to ChatGPT. A powerful language model, ChatGPT is designed to interact with users by generating human-like detailed responses. The ethicality of such a tool is called to question by educational institutions due to its potential for plagiarism. In this report, the ethicality of ChatGPT will be put into a survey to examine the opinions of the general census on whether it belongs in academic settings.

History

ChatGPT was released on November 30, 2022, by OpenAI, an American artificial intelligence research laboratory. The chatbot is built on a fine-tuned version of GPT-3, the third generation of a family of language models called generative pre-trained transformers (GPT). Each generation is defined by its parameter count, the amount of data that they are trained on. ChatGPT is a sibling model to InstructGPT, which is designed to follow instructions and provide a response. ChatGPT is further equipped with safety mitigation and filters to prevent harmful responses to prompts given (OpenAI, 2022).

Methodology

This survey was created on Google forms due to its familiarity with the researchers and the target audience. The prompts were decided upon collaboratively. The survey was distributed to members of academia via text and email. Students we were familiar with were contacted via text with a statement in regards to what our research was about, how it would be used, and a link

to the survey. This survey was also sent with the same message to members of the Toronto Metropolitan University (TMU) faculty that we were familiar with. The data collected would be extracted into a CSV file before being analyzed in Python with the Matplotlib library.

Survey Data

Following the collection of survey data, the following generalizations about the academic perception of ChatGPT can be made: 100% of Professors are aware of and have used ChatGPT. They all agree that the use of it for essays and prompts is plagiarism. However, there is an even split of responses when it comes to its use for research and monetary/commercial purposes; 100% of Graduate students that have heard of ChatGPT without using it (for the cross-section of Graduate students involved in this study) believe that the use of it for essays/prompts is plagiarism, but they are split in regards to its use for research. They are fine with its use for commercial/monetary purposes; Around 25% of Undergraduate students believe that the use of ChatGPT in Academia will have a positive effect on a student's academic learning.

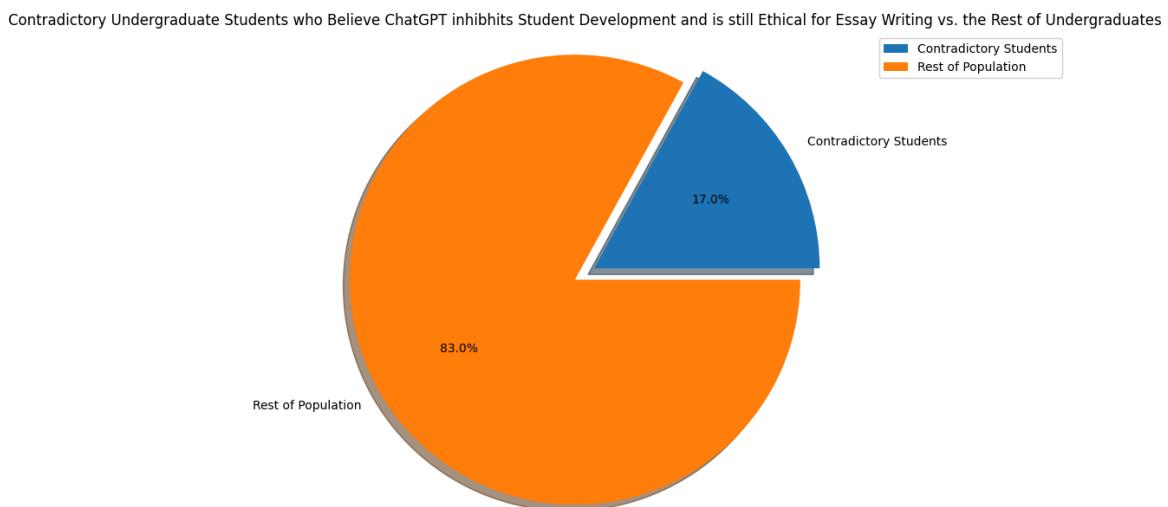


Figure 1: 17% of undergraduates

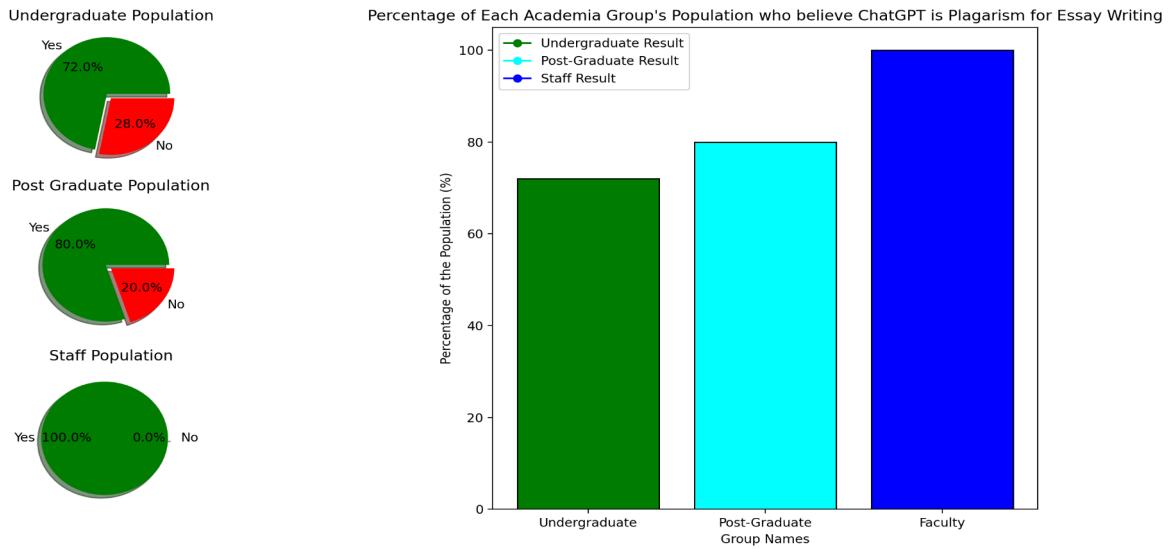


Figure 2: A majority of academia's distinct populations (Undergraduates, Post-Graduates, & Faculty members) view that it's not ethical to use ChatGPT to write essays with

Benefits

The application of ChatGPT in academia can be used in the following areas: When conducting research, you can simplify the process by prompting to summarize the contents for you (Rushda, 2022); second, there is automation to spend more time on research, set ChatGPT to communicate between you and the stakeholders via email. ChatGPT can be a valuable tool for researchers to streamline their work.

Limitations

OpenAI has stated the following regarding ChatGPT's limitations: it may occasionally generate incorrect responses, may occasionally produce harmful instruction or biased content,

and limited knowledge of world events (OpenAI, 2023). However, there are many others outside of this. First, ChatGPT does not offer insights into data. It will summarize a topic or data discovered, however, it will cite them and not create its original responses. It currently cannot construct structured content and lengthy pieces of text as its output is based on the prompt by generating words from the internet (Marr, 2023). ChatGPT is still being trained based on user interaction and data sets up to 2021 (Montti, 2023). The data it is being trained on may have a bias or prejudice leading to biased or discriminatory responses (Marr, 2023). The software is a tremendous tool, but before it can be used in Academia it will have to be improved to overcome these limitations.

Future

With the recent release of ChatGPT Plus, a paid subscription plan, the standard version will likely remain free. It is undeniable that ChatGPT will continue to be used by more and more students. The key factor in its use is the response of academic institutions, whether they embrace it or prohibit it. According to our survey, around 75% of all respondents believe it will have a neutral to negative impact on student development and instructors are averse to the use of it. The use of ChatGPT will have a significant impact in areas of study such as liberal arts, where essays are a common component (Roose 2023). In future iterations of ChatGPT, STEM subjects may be even further affected as well. As a tool to aid in studying, ChatGPT is powerful, but unfortunately, that means that overuse of it can lead to dependency. As the field of artificial intelligence develops, there's no doubt more tools such as ChatGPT will become available and used. Whether this is a problem or not is dictated by academic institutions. If ChatGPT remains to be shunned, then the ethicality of its use will remain controversial for the foreseeable future.

Conclusion

Concluding based on our research, it is clear that academia does not have a favourable view when it comes to the use of ChatGPT within its institutions. [From the scatter plot based on Academia Groups](#), post-graduate and undergraduate students found themselves on the 50% line regarding ChatGPT's ethicality. On the other hand, staff believe that ChatGPT is unethical when it comes to its use. Future studies on this topic should be done with a larger and more diverse sample size. The methodology suggested an overrepresentation of STEM majors. As most of our peers are in STEM. This study was completed with 111 participants, the majority being undergraduate students. Professors and other faculty members were the minority, having more may have brought forward different results. It was difficult getting professors to fill out the form. They would ignore the request, sometimes mistaking it as a spam email or the student's account got hacked. In the future, professors should be approached in person rather than over email to avoid the mistake made this time. Our goal sample size for a future survey is 1,180,883 people which was calculated on Survey Monkey. This sample size must reflect a university's population by area of study. 13% should be Arts students, 30% Business students, 16% Communication and Design students, 16% Community services, 13% Engineering students, Science students 11%, and 1% faculty members as discovered from the TMU page (Enrolment and Faculty Counts, 2022). Ensuring these changes will allow us to have the most accurate results for our study.

Appendix

Screenshot of Survey

The screenshot shows the first page of a survey titled "ChatGPT in Academia Survey". At the top, there is a small image of a person holding an umbrella. Below the title, there is a welcome message and a note about the purpose of the survey. It also includes instructions for filling out the form and a note about data analysis. The user's email address, "hameez.iqbal@torontomu.ca", is listed as the account used.

ChatGPT in Academia Survey

Welcome,

Thank you for accepting our invite to participate in this survey. This form will be used in the CPS412 (Social Issues, Ethics, and Professionalism) Course at Toronto Metropolitan University in studying if it is appropriate to use ChatGPT in Academia. It will be analyzed by Hameez Iqbal, Alan Pangnathip, Kyle Teopiz, and Joseph Carvalho; Computer Science students at Toronto Metropolitan University.

Please only fill this form out **ONLY if you are IN ACADEMIA (Undergrad or above)**.

Please proceed to the next section if you consent to the use of this data for this analysis of ChatGPT.

Note that all responses will be kept anonymous.

✉ hameez.iqbal@torontomu.ca (not shared) [Switch account](#) [Cloud](#)

[Next](#) [Clear form](#)

The screenshot shows the "General Questions" section of the survey. It includes a heading, a note about required fields, and a list of age categories for selection. The user has selected the option "Under 18".

ChatGPT in Academia Survey

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* Required

General Questions

Age: *

Under 18

18-23

24-30

30-40

40-50

50+

Gender: *

- Male
- Female
- Prefer Not To Say
- Other

Position in Academia: *

- Undergraduate Student (Full-time)
- TA
- Professor
- Faculty Member
- Undergraduate Student (Part-time)
- Master's Degree
- PhD
- Post-Doctoral Fellow

Which municipality are you from? *

- Ajax
- Brampton
- Burlington
- Caledon
- Kitchener
- Markham
- Milton
- Mississauga
- Oakville
- Oshawa
- Pickering
- Toronto
- Vaughan
- Waterloo
- York
- Other



ChatGPT in Academia Survey

 hameez.iqbal@torontomu.ca (not shared) [Switch account](#) 

* Required

ChatGPT Question

Have you heard of ChatGPT? *

- Yes
- No

[Back](#) [Next](#) [Clear form](#)



ChatGPT in Academia Survey

✉ hameez.iqbal@torontomu.ca (not shared) [Switch account](#)

* Required

Exploring the impact of ChatGPT

ChatGPT is an AI designed to assist people in finding information. It is a digital assistant, similar to Siri, that is capable of understanding human queries to respond with helpful and informative answers. It can assist in a wide range of topics such as science, technology, world issues, to pop culture. It is constantly being updated for better performance, but its data set only contains information up to and including the year 2021 (at the time of this study).

[Read more](#)

Have you used ChatGPT? *

Yes
 No

Do you think the use of AI such as ChatGPT is plagiarism when students use it * to write essays/prompts for themselves?

Yes
 No

!

Do you think the use of ChatGPT for research is unethical/plagiarism? (in this case, research means gathering information from multiple sources and condensing it into a summary-style format for learning purposes). *

Yes
 No

Do you think the use of ChatGPT for commercial/monetary purposes is * unethical? Some examples of this may include journalists that are part of social companies using ChatGPT to write articles or authors using ChatGPT to write storylines.

Yes
 No

Rate the effect ChatGPT has on students' development? (in terms of learning * and development of academic-related skills)

1	2	3	4	5	
Highly negative	<input type="radio"/> Highly positive				

Do you think ChatGPT leaves academic course instructors at an advantage or * disadvantage?

1	2	3	4	5	
Severe disadvantage	<input type="radio"/> Beneficial advantage				

Do you think the use of ChatGPT is unethical when used for personal reasons. * Some examples include responding to emails, creating schedules for yourself, and lifestyle advice.

Yes
 No

[Back](#) [Next](#) [Clear form](#)



Is ChatGPT ethical based on Academia groups

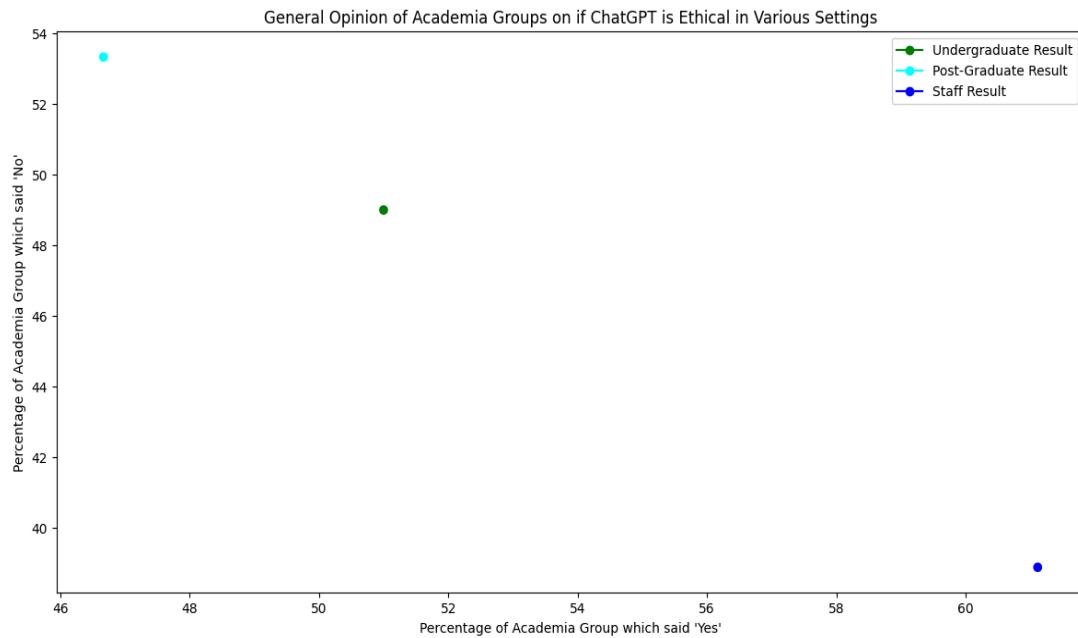


Figure 3: This scatter plot shows the relative percentages of all the distinct academia groups that said “yes, ChatGPT use is not ethical” and “no, ChatGPT use is ethical” for all 3 scenarios [\[Return to Conclusion\]](#)

Survey Improvements

Improvement of Methodology

In regards to improvements in our methodology, it would be beneficial to not distribute the survey ourselves to prevent bias. The survey was recommended to people that we knew and trusted. As a result, it was unintentionally sent mostly to STEM majors, TMU students, and other computer science students who were also studying this topic. There are three ways the survey could be distributed in the future: (1) TMU itself distributes the survey to its students via email. A university is an institution for research and share of thought. TMU is a stakeholder in this survey as this research is being completed by TMU students. TMU has the means to distribute, having an email list with every single student and faculty. (2) The Toronto Metropolitan Student Union, Toronto Metropolitan University Graduate Student Union, Canadian Union of Public Employees, Ontario Public Service Employees Union, and the Toronto Metropolitan Faculty Association all together also have the means to distribute, having an email list with every single student and faculty member as they are registered with either one of the union. They are all stakeholders of the university. (3) The Council of Ministers of Education, Canada, is a direct stakeholder as the future of each of their provinces is dependent on the education of its youth. If the youth lack certain skills due to the emergence of ChatGPT affecting their education, the future of the province would be at jeopardy. The province has information of its constituents which has mainly been used during election time to distribute election information. The same system can be used to contact people in academia to collect their voices. The latter would also give us the best opportunity to reach our target sample size.

This research began in February of 2023 when the popularity of ChatGPT was just beginning and the version being used was ChatGPT - 3. A future study should not only include the questions used in this survey but include questions that reflect on how the world has reacted to the emergence of ChatGPT. A possible period of time for a second survey could be the spring of 2024. By then, it would have been one year since the emergence of ChatGPT - 4 and individuals in Academia may have had more experience working with the AI and a clearer opinion. By then, we predict Universities and other educational institutions would have policies in place in regards to the use of ChatGPT. We expect to see different results when differentiation between this current survey and a future one.

Our study asked about the participants' political views. We chose not to include it in the report due to the primary focus on Academia and limited word count. We do believe with a larger and more diverse sample size, we will discover unique trends in how political views are tied to the perspective on whether ChatGPT should be allowed in academia.

Calculation of Sample Size

With the aid of a survey monkey, we were able to estimate what our goal sample size should be, determining the population size, margin of error, and sample confidence level. We want our results to reflect Canadian Universities thus the population being a combination of full-time university students and full-time faculty members. According to the Council of Ministers of Education, Canada, there were 1,090,000 full-time enrolled students and 266,000 part-time enrolled students in Universities in 2019. Also according to the Council of Ministers of Education, Canada, there were 47,000 full-time faculty members in Universities in the year 2020 (Council of Ministers of Education, Canada, 2020). Thus totaling a population of 1,403,000. The

confidence level is “a percentage that reveals how confident you can be that the population would select an answer within a certain range” (SurveyMonkey, 2018). In our results we discovered that 85% of respondents chose yes to either one of the following questions “Do you think the use of AI such as ChatGPT is plagiarism when students use it to write essays/prompts for themselves? “, ” Do you think the use of ChatGPT for research is unethical/plagiarism?”, and “ Do you think the use of ChatGPT for commercial/monetary purposes is unethical.” Thus 85% became our confidence level. To determine the margin of error, we looked at the total population vs the population of TMU as that is our direct and most accessible population to complete this survey. In the 2021-2022 school year, TMU has 36,020 students enrolled and 967 faculty members, totaling 36,987 people (Enrolment and Faculty Counts, 2022). TMU represents 0.02636279% of the population for our survey, thus also our margin of error.

$$\text{Sample size} = \frac{\frac{z^2 \times p (1-p)}{e^2}}{1 + \left(\frac{z^2 \times p (1-p)}{e^2 N} \right)}$$

Figure 4: Sample size formula from SurveyMonkey

Given the equation above from SurveyMonkey, where ‘N’ is the population size, ‘e’ is the margin of error(percentage in decimal format), ‘z’ is the desired confidence level converted to a number by SurveyMonkey, and ‘p’ is the decimal value of a certain response the sample size chose (Calculating the Number of Respondents You Need, 2023). We were given the result of 1,180,883 people for the sample size.

Possible New Questions

To ensure we are meeting the quota for the area of study, there should be a question asked in regards to what area they study. There should have been questions prompting how they think ChatGPT will shape the future of education.

Possible questions and responses for the future survey:

1. What is your area of study?
 - a. Arts
 - b. Business
 - c. Communication and Design
 - d. Community Services
 - e. Engineering
 - f. Science
 - g. Other (Please list)
2. Which group best describes you at University?
 - a. Arts student
 - b. Business student
 - c. Communication and Design student
 - d. Community Services student
 - e. Engineering student
 - f. Science student
 - g. Faculty member
3. How have you used ChatGPT for school?
 - a. Research

- b. Writing
 - c. Brainstorming
 - d. Not at all
4. Where do you see universities allowing ChatGPT?
- a. I see them not allowing it at all
 - b. Research
 - c. Brainstorming
 - d. Essay/Report Writing
 - e. Other (accept response)

Analysis of the 5 Theories with respect to ChatGPT use in Academia

Act Utilitarianism: Using ChatGPT for work within Academia could redirect the time spent from writing and researching into other areas of focus that may be more beneficial in the long run. Therefore, ChatGPT's use in Academia is right.

Rule Utilitarianism: If everyone used ChatGPT for their coursework in Academia, the greatest increase in happiness would arise as time would be saved, stress would be reduced, and more independence from others would arise from its use. Therefore, ChatGPT's use in Academia is right.

Social Contract Theory: ChatGPT's use for coursework violates Policy 60/Academic integrity. Therefore, ChatGPT's use in Academia is wrong.

Kantianism: If every person used ChatGPT within Academia, the work produced by ChatGPT would not be reflective of each individuals' own personal contributions. Therefore, ChatGPT's use in Academia is wrong.

Virtue Ethics: A virtuous person would strive for honesty within academia and not use ChatGPT for their coursework. Therefore, ChatGPT's use in Academia is wrong.

Since % theories argue that ChatGPT's use in Academia is wrong, it is not morally correct to use ChatGPT within Academia.

Hameez's Limitation Experiment

To verify the limitation brought forward by our research, Hameez performed his own test cases on ChatGPT:

1. Incorrect responses
 - a. When prompted to Summarize “Online Social Networks and Media” by Dr. Syeda Nadia Firdaus, Dr. Cherie Ding, and Dr. Alireza Sadeghian, it provided an incorrect summarization.
 - b. When prompted about the Head of State for Canada, it provided the response that it knew it was previously Queen Elizabeth II, however was unsure about who was the leader at the current time (February, 2023) . Verifying it did not have knowledge past the date of September 2021.
 - c. When prompted about certain buildings on campus, it would often output incorrect information. It sometimes would talk about the wrong building. For example, when prompted about Kerr Hall at TMU, it wrote about Kerr Hall at the University of North Texas.
2. Generating long pieces of content that follow a certain structure

- a. When prompted to write a thriller story of 12 chapters with at least 6 paragraphs in each chapter, it failed to do so after the first chapter. It also seemed to be losing the story outline as it made it further through the story.

Bibliography

Calculating the Number of Respondents You Need. (2018). SurveyMonkey.

<https://help.surveymonkey.com/en/surveymonkey/solutions/calculating-respondents/>

Council of Ministers of Education, Canada. (2014). *Council of Ministers of Education, Canada*.

CMEC. <https://www.cmecc.ca/299/Education-in-Canada-An-Overview/index.html>

Enrolment and Faculty Counts. (2022). Toronto Metropolitan University. Retrieved March 28, 2023, from <https://www.torontomu.ca/university-planning/data-statistics/key-statistics/>

Marr, B. (2023, March 3). *The Top 10 Limitations Of ChatGPT*. Forbes. Retrieved March 19, 2023, from

<https://www.forbes.com/sites/bernardmarr/2023/03/03/the-top-10-limitations-of-chatgpt/?sh=2a0792cc8f35>

Montti, R. (2023, January 31). *11 Disadvantages Of ChatGPT Content*. Search Engine Journal.

Retrieved April 1, 2023, from

<https://www.searchenginejournal.com/disadvantages-chatgpt-content/477416/>

OpenAI. (2022, November 30). *Introducing ChatGPT*. OpenAI. Retrieved March 22, 2023, from

<https://openai.com/blog/chatgpt>

OpenAI. (2023, March 8). *ChatGPT*. Chat.openai.com. OpenAI Retrieved March 8, 2023, from

<https://chat.openai.com/>

Roose, K. (2023, January 12). Don't Ban ChatGPT in Schools. Teach With It. *The New York Times*. Retrieved April 1, 2023, from

<https://www.nytimes.com/2023/01/12/technology/chatgpt-schools-teachers.html>

Rushda, S. (2022, December 19). *ChatGPT explained: What are its benefits and limitations?* HGS. Retrieved April 1, 2023, from

<https://hgs.cx/blog/chatgpt-explained-what-are-its-benefits-and-limitations/>

WeeTech Solutions. (2023, January 30). *What is ChatGPT and the Benefits of Using ChatGPT.* WeeTech Solutions. Retrieved April 1, 2023, from

<https://www.weetechsolution.com/blog/what-is-chat-gpt-and-the-advantages-of-using-chat-gpt>

SurveyMonkey. (2018). *Sample Size Calculator: Understanding Sample Sizes* | SurveyMonkey. SurveyMonkey. Retrieved from

<https://www.surveymonkey.com/mp/sample-size-calculator/>