Exploring Undergraduate Student Perceptions of Generative AI in College Writing: An Experience Report

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Abstract
In a landscape where Generative AI is becoming increasingly influential across various sectors, its role and impact in educational settings, particularly from the viewpoint of undergraduate students, becomes essential to explore. This paper delves into the perceptions of students regarding the integration of GenAI tools like Claude AI in a college writing course. The aim is to utilize AI to enhance the processes of drafting and revising written work. This study examines how students perceive the utility and educational implications of AI in writing. Their feedback indicates a positive engagement with AI, providing critical insights into its potential and limitations and highlighting its role in enhancing the quality of writing and equipping students for an AI-driven future.

Background and Context
The integration of Generative AI (GenAI) models, such as ChatGPT by OpenAI (2022) and Anthropic's Claude AI (2023), is revolutionizing the domain of academic writing (Chetwynd, 2024; AlAfnan & MohdZuki, 2023; Grassini, 2023). These models offer the unique ability to produce diverse, human-like text, marking a significant transformation not only in creative sectors but also in academic spheres. The most effective and ethical practices for using these advanced tools in educational settings, particularly in undergraduate writing courses, remain an area ripe for exploration.

In this study, I focus on deploying GenAI tools within an undergraduate writing course at a large Northeastern public research university. This initiative forms a crucial part of a broader endeavor to grasp and leverage the potential of GenAI in a structured educational environment. College Writing 112, a mandatory course for all undergraduates, serves as the canvas for this exploration. The course curriculum is designed to impart foundational writing and language skills, encourage diverse composing practices, and foster a deeper connection between personal, creative, and critical composition.

A vital aspect of this course is the classroom AI usage policy, originally adapted from renowned AI in education researcher Eaton (2023). This policy is crafted to ensure a responsible, ethical, and effective application of GenAI tools, aligning with the course's educational objectives.

The primary goal of this study is to delve into undergraduate students' perceptions of GenAI technologies. It aims to understand how students interact with, respond to, and perceive the influence of GenAI on enhancing their writing skills. The policy and pedagogical strategies have been developed to

promote ethical use of AI, thereby enriching student engagement in writing and fostering competencies in AI Literacy and Prompt Literacy (Gattupalli, Maloy & Edwards, 2023; Trust, 2023; Lo, 2023; Jacobs & Fisher, 2023). This exploration is geared towards providing insights into student perspectives on GenAI tools as integral components of their learning experience—aligning with the growing necessity for AI literacy as a crucial skill set in contemporary educational and professional scenarios (Stolpe & Hallström, 2024). Building on our previous research, which focused on assessing the effectiveness of AI tools in online math learning (Gattupalli, Lee, Allessio, et al., 2023), this current study shifts its attention to the field of writing. The guiding research question for this investigation is: How do undergraduate students perceive and interact with GenAI tools in the context of enhancing their writing skills, and what implications might these interactions have for future pedagogical approaches?

Methodology

Incorporating GenAI into undergraduate writing instruction, I strategically employed Padlet, a student engaging online platform, to collect and analyze student feedback and perceptions. This approach aimed to authentically capture students' direct experiences and reflections on utilizing Claude AI in their writing tasks. From the outset of the course, students were encouraged to integrate Claude AI to enhance their writing assignments, fostering an interactive learning environment.

Padlet's utilization was pivotal in my instructional activities. Students were prompted to share their insights, reflections, and critiques regarding their experiences with Claude AI on this platform. This method draws inspiration from the successful deployment of Padlet in educational settings, as evidenced by previous studies (Fuchs, 2014; Fadhilawati et al., 2020; Jong & Tan, 2021). These studies demonstrate Padlet's effectiveness in gauging students' comprehension, engagement, and academic progression across various subjects.

To foster a space where honest and transparent feedback could flourish, student contributions to the Padlet were kept anonymous. This anonymity was essential to ensure that responses were candid and uninfluenced by potential biases or judgments associated with the students' identities. The confidentiality of this approach provided a more genuine and accurate representation of the students' perceptions and experiences with GenAI in their writing process. The students were asked to consider and respond to specific questions: 1) How has AI helped you in your writing?; 2) Have you utilized AI in this course?; and 3) In what ways has AI facilitated your writing activities?

The data harvested from Padlet offered a wealth of qualitative insights, allowing for a comprehensive analysis of how students interact with and perceive the influence of GenAI on their writing capabilities. This methodology was key in discerning the subtleties of the students' experiences and their developing comprehension of GenAI as an instrumental tool in academic writing. The Padlet, showcasing these valuable student inputs, can be accessed here: https://bit.ly/cw112convos.

Data Source

The focus of my analysis was specifically directed toward the theme of AI's role in writing, as reflected in the Padlet entries. This targeted approach was aligned with my primary research aim: to understand how undergraduate students perceive and utilize GenAI tools in the context of academic writing. The collected

responses offered a diverse range of student perspectives, providing a window into their direct interactions with, and views on, AI-assisted writing processes.

By honing in on the AI-related theme, my analysis maintained a sharp focus on the research question at hand. This strategy enabled a thorough exploration into this particular area of interest, yielding rich qualitative data about students' personal experiences, opinions, and thoughts on the use of GenAI in college writing. The following table, Table 1, presents a compilation of students' inputs gathered from Padlet:

Table 1: Student Perspectives on the Impact of AI in Enhancing Writing Skills (N=18 responses).

How has AI helped you write [in the College Writing course]?
yes, it helped me get more topic ideas for writing my essays
It has helped me create better introductions by taking the ideas they have given me and creating my own
I use AI for the sake of getting a though down in writing then using it to change it into my own words.
I learned that AI can help give ideas and topics for writing. I had never used AI before, but learned how to use it in a beneficial way.
i struggled to find a topic to write about and how to expand on my essay to make it more words so I asked AI to give me more ideas and it helped me write so much more
Previously I never thought of even using AI, I was worried and surprised our teacher would be introducing it to us; however by using it, it has allowed for content suggestions that help me generate an idea of how to create my essay as well as how to structure it.
I was having really intense writer's block. I couldn't figure out what to write about or how to write it. I used AI to kickstart me in the right direction and give me some main ideas to start building off of.
A moment of struggle in my writing was when i had trouble on how to enhance my writing by using more descriptive words and by learning how to transition my paragraphs better. I have asked AI for tips on how to expand my essay or use better finishing sentences.
I learned that using AI can help me expand my knowledge on information about the topic I am writing about which has helped me grow as a writer and expand my logic on new technology
On my 1500 word essay I was struggling to make my writing sounds good so I used ai to make my writing more clear.
Something that I learned and now am passionate about is the value in using AI as an asset to our writing. I was always told by other teachers that AI is off-limits, horrible, and makes us lazy. They are not seeing the value of AI in fighting writer's block and helping our writing with readability.
Sometimes I find it hard to start my papers, I don't know what to write or how to begin. I have learned that I can use AI to help get my paper started and get my brain going.
I have learned about the usage of AI in literature and the amount of tips it can provide you to navigate

you to a better writing path. It has deepened my understanding on many topics and i appreciate the knowledge of it, it can help me in classes in so many ways and not just in literature.
I struggled when we had to write in third person for our essay. we started by writing a 1000 word essay but we had to take our essay and re word it. So I had AI help me change it to third person
A moment of struggle in My writing was trying to complete the 1500 word essay, and how I navigated thought this was relying on AI to help spice up my essay and make it more of a college essay than high school essay.
AI has helped me in this course immensely. I have used it as a resource to overcome my writer's block, enhance my writing for readability purposes, and expand my writing so that it is fuller and longer in length.
AI has really helped to generate ideas/topics for my essays. AI makes writing a lot easier. It just helps me to get my brain working. I use it as a guidance tool if I ever get stuck.
AI has helped me immensely, it has helped me expand on my writing as a person and helped my essays alot, by helping it be longer or elaborating more on the topic

Data Analysis

In this study, a comprehensive data analysis was conducted utilizing Python, a powerful and versatile programming language widely used for data processing and analysis. To explore the depths of the data collected through Padlet, a range of specialized Python packages were employed, each offering unique functionalities crucial for the intended analysis. For example: *pandas* for data manipulation and analysis; *matplotlib* for plotting visualizations to represent data insights clearly (Rajagopalan, 2020); *scikit-learn (sklearn)* and *textblob* for machine learning and statistical modeling, including clustering (Varoquaux et al., 2015; Diyasa et al., 2021); *collections* to facilitate high-performance data manipulation through specialized container data types; and *wordcloud* to generate word clouds from text data, which is a compelling way to highlight key themes or topics prevalent in the data (Jin, 2017).

The combination of these tools allowed for a detailed and multifaceted analysis of the student responses. This included thematic analysis to identify and explore the recurring themes and patterns in the students' feedback, and sentiment analysis to gauge the emotional tone and attitudes reflected in their responses. By harnessing the capabilities of these data science packages, my analysis aimed to unravel the intricate nuances in student perceptions of GenAI in their writing experiences, providing valuable insights that extend beyond surface-level interpretations.

Thematic Analysis

In the field of qualitative research methodology, Thematic Analysis stands out as a pivotal method for discerning, examining, and conveying the underlying patterns and themes within data (Vaismoradi et al., 2016). It effectively organizes and lends clarity to the dataset, bringing to light various facets of a research topic. Applying this method, I conducted a statistical analysis of the students' responses gathered via Padlet. The goal was to identify the most frequently used words, providing insights into the dominant themes in the students' perspectives about using AI in their writing.

The outcome of this analysis is presented in Table 2, which enumerates the words that surfaced most frequently in the student responses, alongside their respective occurrence counts. This table illustrates the prevalent themes in the students' feedback, with the word "AI" being the most prominent obviously, followed by others like "writing", "essay", and "helped". Such findings emphasize AI's significant role in the students' writing endeavors and the various dimensions in which it influences their writing process.

Table 2: Thematic analysis showing occurrence of word (frequency) in student Padlet responses

AI (20 times): This highlights the central role of AI in the students' writing experience.
Writing (17 times): This is a key theme, as the responses relate to writing tasks.
Essay (11 times): Indicates the context of their writing, mostly essay writing.
Helped (9 times), Help (7 times): Reflects the assistance provided by AI.
Write (6 times), Expand (6 times), Ideas (6 times), Using (6 times), Learned (6 times): These words further emphasize the themes of generating ideas, expanding essays, and learning from AI use.

Additionally, to visually represent these findings, a word cloud was generated using the *wordcloud* package. This visualization, depicted in Figure 1, artistically aggregates the most recurrent words from the students' responses, offering a quick and engaging way to perceive the key themes at a glance. The word cloud visually accentuates the words that students frequently associated with their experiences of using AI in writing, thus providing an immediate sense of the dominant themes in their feedback.

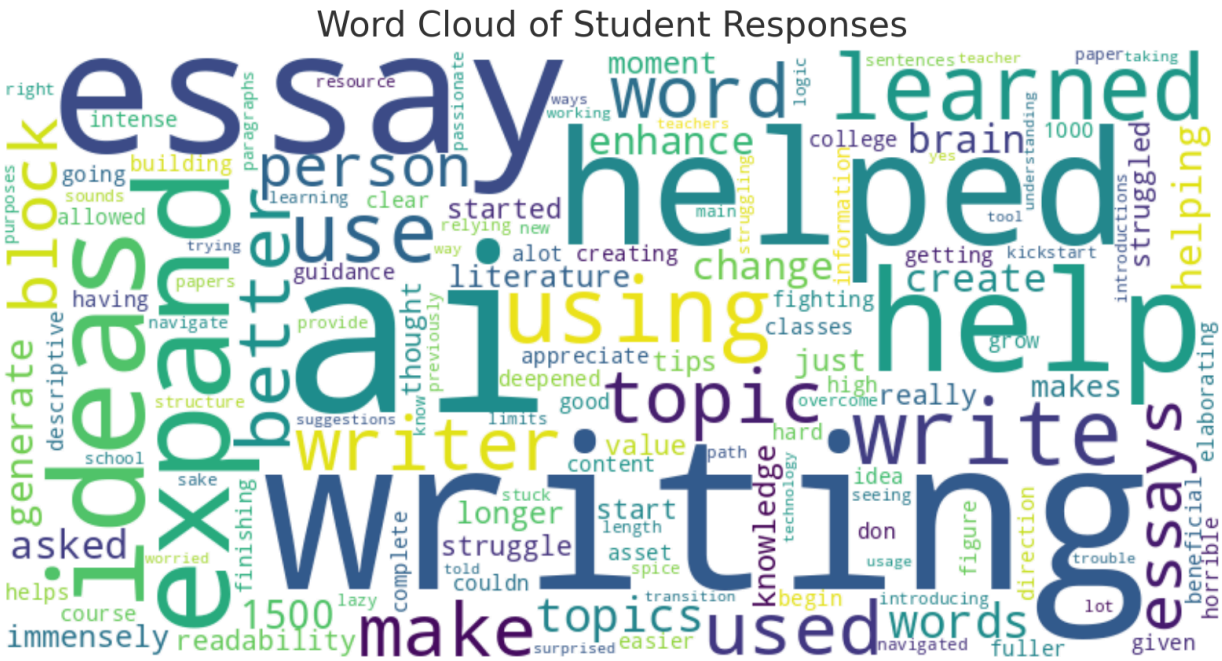

Figure 1: Word Cloud visualization of key themes in student responses on AI usage in writing

The thematic analysis and the accompanying word cloud collectively offer a comprehensive overview of the students' interaction with AI in their writing course. The quantitative data from the thematic analysis,

coupled with the qualitative insights from the word cloud, provide a holistic understanding of how GenAI tools are perceived and utilized by students in enhancing their academic writing skills. The Python code used for thematic analysis is available here: https://osf.io/p57bn.

Sentiment Analysis

Sentiment Analysis serves as a powerful tool for deciphering the emotional undertones within textual data, effectively categorizing statements as positive, negative, or neutral (Medhat et al., 2014). In this study, I apply this technique to gauge students' sentiments about using AI for writing. Each response was assigned a sentiment score, where positive numbers indicate favorable comments, negative ones suggest dissatisfaction, and a score of zero denotes neutrality, typically reflecting factual statements without emotional bias. Table 3 in the following section presents these sentiment scores for individual student responses.

To encapsulate the collective sentiment of students towards AI usage in their writing, all responses were methodically organized into a structured dataframe. This organized approach facilitated the calculation of an average sentiment score, thereby providing a comprehensive snapshot of the students' general attitudes towards AI in their writing activities. This average was computed by evaluating the sentiment value of each response and averaging these to reflect the overall sentiment trend present in the data. The software used to calculate sentiment score has been available here: https://osf.io/wfb7e.

Table 3: Sentiment Scores for Individual Student Responses on Using AI in Writing

Student Response	Sentiment Score	Sentiment Category
1	0.5	Positive
2	0.55	Positive
3	0.222	Positive
4	0	Neutral
5	0.5	Positive
6	0.092	Positive
7	0.217	Positive
8	0.325	Positive
9	0.136	Positive
10	0.433	Positive
11	-0.356	Negative
12	-0.292	Negative
13	0.5	Positive

14	0	Neutral
15	0.253	Positive
16	0	Neutral
17	0.2	Positive
18	0.25	Positive

The analysis yielded an average sentiment score of 0.196 across all student responses. This score suggests a predominantly positive outlook among the students regarding the use of AI in their writing tasks. Results indicate that, on balance, students are more inclined towards expressing favorable views about AI's role in their writing process. Therefore, the primary conclusion drawn from this test result is the positive disposition of students towards the integration of AI in their writing. This perspective views AI not just as a useful tool, but as a beneficial adjunct to their writing practices.

Furthermore, this analysis reveals that even though specific phrases like "AI assisting with writer's block" or "enhancing readability" were not explicitly mentioned in every response, the overall sentiment leans positively towards AI utilization in writing contexts. Again, this general trend underscores the favorable reception of AI tools in academic writing, hinting at their potential to positively influence the writing experience for students.

Results and Discussion

The thematic analysis of student responses has offered profound insights into the diverse roles that AI plays in enhancing college writing. The frequent emergence of terms like "helped" and "ideas" throughout the analysis accentuates the significant role of AI tools in various facets of the writing process. This emphasis on terms linked to idea generation and essay development indicates a growing tendency among students to utilize AI for brainstorming and expanding their written work. In an academic domain where fostering critical thinking and effective communication is crucial, the role of AI as an enabler for generating ideas is particularly striking. This usage resonates well with the core objectives of college writing education, which focus on nurturing students' creative thinking and their ability to express ideas lucidly. AI tools, in assisting with the initial phases of writing, appear to reduce the cognitive load involved in topic selection and preliminary drafting, thereby allowing students to devote more attention to refining their arguments and improving the overall quality of their writing.

Additionally, the sentiment analysis results, denoted by an average score of 0.196, reveal a generally positive attitude among students towards AI tools in the context of writing. This finding is noteworthy, as it indicates an openness to incorporating technology within educational spheres, especially in a field traditionally dominated by human-led processes like writing. This positive stance is in sync with evolving trends in educational technology, where tools are increasingly used to supplement, rather than substitute, human capabilities. In the realm of college writing, this favorable view of AI can serve as a springboard for innovative teaching approaches, prompting educators to embed AI more integrally into their instructional strategies. Such integration promises to create a more dynamic and engaging learning environment, equipping students with both conventional writing abilities and the skills to effectively

harness contemporary technological aids in their academic endeavors. The positive reception of AI also highlights its potential in creating a more inclusive educational setting, particularly benefiting those students whose mother tongue is not English but enrolled in an English-speaking university, or encounter initial hurdles in writing or grapple with challenges like writer's block.

In essence, the analyses of both thematic elements and sentiments in student responses unveil a paradigm shift in college writing pedagogy, wherein AI tools are not just accepted but are valued for their contributions to the writing process. This shift is instrumental in shaping future educational methodologies and underscores the importance of developing curricula that seamlessly blend traditional writing competencies with digital proficiency. Such an approach prepares students not only for their current academic pursuits but also for a rapidly evolving digital professional world, making them adept at navigating the intersection of technology, creativity, and critical thinking.

Conclusion

Addressing the research question—how do undergraduate students perceive the role of GenAI tools in their writing processes?—this study unveils a significant shift in the educational paradigm of college writing. As Gen AI tools such as Claude AI and ChatGPT increasingly infiltrate academic fields, their impact on both the mechanics and the cognitive aspects of writing is profound. The thematic analysis of student responses revealed extensive use of AI for brainstorming, navigating writer's block, and enhancing essays. This indicates AI's role not only in the mechanical facets of writing but also in fostering deeper cognitive engagement, prompting students to think more expansively and critically.

A particularly notable finding, reflected in the positive sentiment score of 0.196, is the students' optimistic reception of AI in writing. This indicates a transformative shift in educational ethos, where technology seamlessly merges with traditional learning methods and philosophies. This fusion suggests an educational environment where AI is not just a tool for writing improvement but a catalyst for cognitive and creative development.

The implications of these findings for teaching college writing are substantial. As we venture into a future where AI's role in professional spheres is expected to grow, equipping students with a comprehensive understanding of ethical and responsible computing becomes paramount. This research advocates for an interdisciplinary approach in education, especially in writing courses, where the use of AI is coupled with the nurturing of critical thinking, creativity, and ethical sensitivity. Such a balanced approach not only enriches academic proficiency but also equips students to face the intricacies and ethical dilemmas of a digitally-oriented world.

In conclusion, this study sheds light on a path where the integration of AI in education transcends mere learning augmentation. It represents a pivotal stride towards nurturing a generation capable of skillfully blending technology, ethics, and creativity. AI, in this context, transforms from a mere tool to a broader canvas, inspiring students to embark on intellectual journeys marked by richer and more diverse thought processes. This exploration and understanding of AI's role in education illuminates a future where technology and human intellect are not in competition but in collaboration, painting a vibrant and dynamic educational landscape.

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