



# Generative AI: Student Perception on ChatGPT Prompt Feedback in Post-Secondary Online Education

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## Abstract

This study investigates the role of AI, particularly Chatbot feedback, in student performance and writing. Using constructivist learning theory, it examines both the benefits and challenges of AI in online coursework. Data from student experiences reveal generally positive attitudes toward AI but raise concerns about generic feedback hindering critical thinking. Key implications include the importance of integrating AI thoughtfully into pedagogy, providing professional development for educators, and designing curricula that balance AI use with fostering independent thinking. These insights are crucial for educators and policymakers considering AI's role in education.

**Keywords:** Artificial Intelligence, content generation, detection

## 1. Introduction

In March 2020, the education system was abruptly disrupted shifting from face-to-face teaching to an online format. Due to the nature of online teaching, post-secondary educators had to adapt how they went about teaching in the transition. Approximately 90% of institutions surveyed “engaged in some form of emergency distance/virtual education to complete the spring term,” (Lederman, 2020). Although teachers understood the reason for the shift, 55% of educators surveyed indicated the transition to online was not smooth while 67% did not consider online teaching during the pandemic to be a positive experience (DeCoito & Estaiteyeh, 2022). The shift presented challenges to educators that were time-consuming ranging from adapting to various educational platforms and software to procedures for implementation. Approximately 56% shared the need to adopt new teaching methods when transitioning to courses to remote delivery (Lederman, 2020). This did not mean educators were wanting or willing to engage with this new style of teaching as surveyed respondents revealed a level of anxiety and scrambling to fulfill their instructional duties (Lederman, 2020). Nevertheless, the adjustment had to be made. According to an EdWeek national survey, the common tools utilized during the pandemic were Google Meet/Hangout and Zoom Conferencing (Herold, 2022). Between March 2020 to January 2022, nearly 60% of educators surveyed said, “Their experiences using edtech during remote learning had made them more

willing to use technology with their students,” (Herold, 2022). Since educators expressed a receptive and welcoming attitude about technology use in the classroom, it was equally important to evaluate their attitude and perception about integrating Artificial Intelligence (AI) tools in post-secondary online classrooms.

In November 2022, during the return of face-to-face education, ChatGPT was released which caused a stir in education because everyone began asking about this new technology. Naturally, many instructors panicked because of the idea that students were now able to cheat on assignments and tests (Anders, 2023). In Ghimire et al (2024) study, he investigated factors that influenced faculty members’ attitude towards using ChatGPT and discovered faculty members had a negative attitude and perception towards using ChatGPT because of potential risks with cheating and plagiarism. Contending with the reality that this software is not going away, researchers also surveyed 20 university instructors on how they planned to adapt to the growing presence of AI tools such as ChatGPT and GitHub and discovered many had different opinions on whether to resist or embrace these tools in their courses (Ghimire et al., 2024). On the other hand, 385 students were surveyed about their view of AI in classroom engagement, and 39% felt AI had a positive influence in education while 49% agreed that AI influenced their learning (Kairu, 2020). These findings buttress the belief that Generative AI holds immense potential to revolutionize the teaching and learning process by providing personalized, adaptive, and innovative educational experiences, ultimately enhancing student engagement, comprehension, and retention in online learning spaces and face-to-face when carefully cultivated.

The COVID-19 pandemic accelerated the adoption of AI tools in education as institutions quickly shifted to online learning. In March 2020, educators faced the unprecedented challenge of transitioning from face-to-face teaching to virtual platforms, with 90% of institutions adopting emergency remote instruction (Lederman, 2020). This rapid shift, while necessary, was met with mixed reactions. A significant number of educators (55%) reported difficulties adapting to online teaching, and over two-thirds found the experience to be negative (DeCoito & Estaitayeh, 2022). Nevertheless, the urgency to continue instruction led educators to explore new teaching methods, with many relying on tools like Zoom and Google Meet to maintain student engagement (Herold, 2022). The increased reliance on technology opened the door to wider adoption of AI tools in classrooms. By 2022, educators were not only more comfortable using edtech but also began grappling with the implications of integrating AI technologies, such as ChatGPT, into their teaching practices. Therefore, this action research extends the discussion on Generative AI tools in education by exploring the integration of AI tools in an online learning platform.

## **2. What is AI?**

To understand AI, let’s explore the common types of AI. Traditional AI, in simple terms, is “the science of making machines that can think like humans” (Pattam, 2021). Generative AI, by contrast, can create text outputs, music, images, and even computer code (Marr, 2023). AI, as we know it today, has been part of the tech landscape for years, shaping our interactions in various ways—from playing chess with bots to consulting virtual assistants like Google, Siri, or Alexa. One of the most transformative examples is unmanned aerial vehicles, or drones.

AI’s role in education has expanded rapidly, especially with the introduction of generative tools like ChatGPT. Baidoo-Anu and Owusu Ansah (2023) emphasize both the opportunities and challenges these tools present in educational settings. They highlight AI’s ability to provide personalized feedback and foster interactive learning, but they also warn of issues such as biased data, which could perpetuate inequities in educational outcomes.

Similarly, Shams, Zowghi, and Bano (2023) discuss how AI systems, functioning as mirrors of society, reflect underlying biases and societal prejudices, particularly affecting marginalized communities. Despite these challenges, educators have recognized the potential of AI. According to a 2023 Forbes Advisor survey, 55% of educators believe AI positively impacts the teaching and learning process, and 60% have already adopted AI tools such as AI-powered educational games and intelligent tutoring systems in their classrooms (Hamilton & Swanston, 2023).

AI's impact on education mirrors the broader historical trajectory of technological advancements. From Allen Newell and Herbert Simon's 1956 creation of the Logic Theorist, an early attempt to mimic human problem-solving, to the recent introduction of generative AI models like ChatGPT, these tools continue to shape learning environments. Baidoo-Anu and Owusu Ansah's (2023) research suggests that educators and policymakers need to work together to ensure that AI is implemented ethically and effectively in classrooms. This evolution underscores the importance of preparing students not only to use AI tools but also to understand their limitations, as AI expert Kai-Fu Lee predicts that AI may soon become the most transformative technology in human history (Miller, 2023).

However, while the educational value of AI tools is growing, challenges related to ethics, bias, and academic integrity remain. Concerns about cheating and uncritical use of AI-generated content are frequent in academic discussions (Perkins, 2023). Baidoo-Anu and Owusu Ansah (2023) also found that, although AI offers benefits like enhanced learning and productivity, educators remain cautious about its potential misuse and the quality of AI-generated feedback. As AI continues to evolve, educators must prepare students to use these tools responsibly and critically, ensuring that AI not only aids in learning but also upholds principles of equity and inclusion.

### **3. Using AI the *Write Way***

AI is not meant to replace the teacher. More precisely, AI is a “combination between automation and the instructor's attention” (Thongprasit & Wannapiroon, 2022,). This resource is meant to supplement and serve as a ready writing and research assistant. And although this tool is meant to assist, it also has “the capability to autonomously produce human-like text and images and engage in various intellectual tasks. Because of this, AI systems have disrupted the traditional role of higher education institutions in knowledge transfer and skill development” (Walczak & Cellary, 2023). However, “the key to harnessing the power of AI lies in teaching learners to use the tool for inspiration and feedback” (Clark, 2023). This approach can begin by teaching students to use the tool ethically. When thinking of ethics while using generative AI- plagiarism is not the only concern. Copyright of materials must be considered as well. This gets complicated when educators upload student's work into AI to get feedback from the program. This ambiguity of ethics in writing must enter the conversation to address copyrighting on the intellectual content educators and students have created. It is important that educators understand that when they upload entire lesson plans, lectures, quizzes, assignments, and slide decks, they are voluntarily releasing their copyright of their intellectual property.

Ethics must also address accessibility when considering the use of generative AI programs. Educators must remember integration of AI into their learning spaces may be a great idea, but student disenfranchisement must be at the forefront of planning. If AI assignments are going to be embedded into the curriculum, then ethics for implementing AI must be considered. Oftentimes marginalized communities still experience the digital divide, and educators must consider the barriers facing this targeted group of learners. Some do not have access to a stable internet connection, some may not be able to afford fast enough internet access, and language

barriers also affect the use in how prompts are created and if they are created within the context of academic integrity.

Higher education institutions have established a universal language for Academic Integrity (AI). According to Tauginienė et.al (2018), AI can be defined as “compliance with ethical and professional principles, standards, practices, and a consistent system of values that serves as guidance for making decisions and taking actions in education, research and scholarship. (2018).” Because AI refers to systems that have similar human-like traits emulating human produced content, it presents a cautionary concern in education that students will no longer be held to a standard of being able to think for oneself; thereby, inviting ethical consideration to the conversation. In the context of AI in education, students should be informed that the use of AI in an undeclared and/or unauthorized display of “...AI tools to produce work for academic credit or progression (e.g. students’ assignments, theses or dissertations) may be considered a form of academic misconduct (“any action or attempted action that undermines academic integrity and may result in an unfair academic advantage or disadvantage for any member of the academic community or wider society,” (Taugieniene et. al, 2018). And while AI may threaten academic integrity, it also presents opportunities.

Even while there are opportunities for AI to impact student reading and writing experiences, it is equally important to explain to students the potential risks and benefits. While immediate feedback from AI is useful to students and their writing, educators must take cautionary measures to inform students not to take the work of AI too seriously. “There are biases built into AI models and datasets.... [that] have gaps and voids” (Miller, 2023, Mollick et al., 2023; Baidoo-Anu & Owusu Ansah, 2023). If students are not informed of these pitfalls, the mistakes generated by AI could create misunderstandings in students’ worldview that may not be corrected. AI can expose students to increased creativity and inspiration, but this is only the beginning. The essential skills educators want to keep at the forefront of teaching and learning are critical reading and critical thinking. Therefore, how educators employ the use of AI in the classroom is crucial to the learning experience. This is why, “it is important to include information about AI in education for all students and in training for educators. If students do not have the opportunity to learn about the ethical use of AI, they will be more susceptible to engaging in inappropriate use of AI, which may constitute academic misconduct,” (Taugieniene et. al, 2018). To this end, the researchers of this study posit AI is a tool, not the source, for educating students. The key to optimizing the power of AI as a tool is teaching learners the how, the when, and the why for using AI during the learning process.

#### **4. Teaching and Learning is Changing-Are you?**

AI is not in any shape, form or fashion slowing down. As a matter of fact, it is rapidly advancing and changing the face of teaching and learning. Students are aware of its capabilities and use in attaining student success, especially in writing. This alone is an informative measure that using AI in education can benefit student performance with writing. However, ideas around using this tool also need to include digital literacy. Educators who are currently using AI as part of the learning experience, need to recognize that not all students have the digital literacy skills needed. Creating strong prompts, critical reading, thinking, and evaluating skills are paramount in education. When looking through the lens of AI, students will have to be able to discern quality and credibility of using AI sourced materials. Proper utilization of AI and understanding how the algorithms work must be at the base of learning AI. This is necessary to mitigate the risk of spreading misinformation (hallucinations) and being able to navigate through the digital experience.

For some educators, adjusting to the use of AI in learning spaces is a vast learning curve. As researchers Iqbal and Ghimire (2024) discovered, some educators are reluctant to use the tool while others are receptive and willing to use the tool in various learning spaces. Since educators are charged with preparing students to be productive, technologically equipped citizens, educators may want to consider exploring the innovative opportunities AI tools present for teaching writing. “To balance the need for innovation and progress in the field of AI with the ethical considerations associated with detecting AI-generated content, it is essential to prioritize transparency and accountability” (Uzun, 2023). One thing an educator may consider is that students are already living in a world of AI and technological advancement. They have access to AI platforms that can write an essay or a book report for students in less than half the time. And although these variables present cause for apprehension and uncertainty to employ AI in education, the integration, implementation, and understanding of AI will take time and patience. One way to start this journey is to take small steps, be patient, and be willing to try and learn the tool. If educators continue to resist AI because of fear of the unknown, essentially the presumed fear will hinder students’ journey towards being productive citizens. As Miller shared (2023), “In the end, we’re in this together,” and we must find ways to support each other and thrive.

## **5. Theoretical Framework**

For this study, the researchers chose a conceptual model grounded in constructivist learning theory to guide the inquiry-based study. Constructivism, which posits that learners build their own understanding through interaction with new information, helps frame how students can actively engage with Generative AI in the classroom (Olusegun, 2015). The framework illustrates how Generative AI can serve as a cognitive tool for scaffolding student learning, allowing students to use AI-generated feedback to revise discussion board responses before posting for public review. The integration of ChatGPT conversation into post-secondary online settings provide “...opportunities for learners to engage in authentic language interactions, thereby, fostering their communicative competence and fluency” (Hatmanto & Sari, 2023, p. 2). As cited in Hatmanto and Sari (2023) research, Zhong (2018) posits the belief that “... technology enhanced language learning can foster learner autonomy and independence, enabling students to take charge of their language learning voyage,” (p. 2). Subsequently, this study aligns to previous researchers’ belief by creating a space for learners to confront their understanding of ChatGPT by employing the tool in a new learning situation—the online setting. The incorporation of ChatGPT into the online setting is consistent with the constructivist learning theory. Students actively engaged with language production and problem-solving by negotiating meaning through the co-construction of knowledge and reflection on their language use (Hatmanto & Sari, 2023).

The application of constructivist learning theory in this study is pivotal in understanding how Generative AI can facilitate active learning experiences. By using AI as a cognitive tool, students can revise their work based on AI-generated suggestions, participating in the co-construction of knowledge. This approach enhances language skills and promotes critical thinking as students negotiate meaning and reflect on their understanding. Furthermore, research supports that when AI is integrated into the learning process, it can create personalized learning environments that address diverse educational needs, particularly for students with disabilities (Karakose & Tülübaş, 2023). The guided research questions were created to allow students to interpret their conceptual understanding of Generative AI in their learning by sharing their perceptions of AI as a learning tool. While some educators embrace AI, others remain apprehensive about integrating it into teaching and learning practices. This study, therefore, seeks to extend the conversation surrounding AI’s role in post-secondary online

learning and explore its implications for future curriculum design within a framework of the constructivist learning theory.

## **6. The Study**

The research surrounding the implementation of Generative AI in post-secondary online coursework is very limited. This action research was designed to add to the discourse on Generative AI with a focus on students' perspectives on employing this tool to assist in discussion board response writing. Therefore, the goal of this qualitative study was to explore student attitudes and perceptions after interacting with ChatGPT 4.0 to complete discussion board activities.

ChatGPT 4.0 is a conversational AI model that was integrated into the course by providing students with access through a web-based interface. The integration of ChatGPT involved using it as a cognitive tool for scaffolding student learning. This included enabling students to interact with AI for personalized feedback on their discussion board responses before submitting them for grading or peer review. By incorporating ChatGPT into course activities, students were encouraged to engage in authentic language interactions, promoting their communicative competence and fluency (Hatmanto & Sari, 2023). Students were given clear guidelines on how to interact with ChatGPT, including suggested prompt formats to elicit useful feedback.

After each activity, students' attitudes and perceptions were surveyed using online discussion boards to collect data. Four research questions were presented to the participants in this study:

RQ1: How do students think prompt feedback could assist in student performance?

RQ2: What are students' thoughts about prompt feedback after conversing with a Chatbot?

RQ3: What are the benefits and challenges students identified with using Chatbot for writing?

RQ4: What are students' sentiments towards having accessibility to AI to assist with writing?

## **7. Method**

By providing structured guidance and ensuring that ChatGPT 4.0 was a consistent part of the discussion board activities, this study aimed to offer replicable insights into the benefits and challenges of using AI in online education.

### **7.1. Participants**

The researchers employed a non-probabilistic convenience sampling technique. The participants of this study were post-secondary fourth-year pre-service educators enrolled in an eight-week semester online methods course. Seven participants, five females and two males, shared their experience by answering an online discussion board survey. Since the data was archival and done within the scope of teaching, IRB was not required. However, permission to conduct the study was sought from the College Institutional Review Board (IRB).

### **7.2. Procedures/Data Collection**

The collection of data was obtained in a free-form text format by having participants answer an open-ended discussion board prompt in a learning management system. The study lasted for a total of seven weeks, with students presented with one research question every two weeks through a discussion board prompt. When students answered the discussion board

questions, the data was downloaded for later analysis. Recognizing the importance of data privacy, participants were informed about the study, their rights, and the measures taken to ensure that their responses were protected from harm and risk. To avoid bias in the data analysis, the findings were reviewed by inviting two peers to assess the research plan and data results. Furthermore, researchers acknowledged potential biases inherent in AI systems, such as algorithmic bias and the possibility of reinforcing stereotypes, which could influence student interactions with AI tools (Binns, 2018; Holstein et al., 2019). This awareness highlights the ethical responsibility of educators to critically evaluate AI-generated content and ensure that it promotes equitable learning opportunities. By adhering to ethical research practices that emphasize transparency and participant confidentiality, researchers also reinforced the need for responsible use of AI tools in educational settings, emphasizing that educators should be prepared to navigate these challenges to foster a fair and inclusive learning environment.

### **7.3. Data Analysis**

Creswell's (2008) hand analysis procedure was used to discover and establish a pattern of consistency. All data was then imported into a Microsoft Excel computer file for analysis. The imported data allowed for flexible coding of typed data within specific categories. In collaboration with the two peer reviewers, researchers employed Maguire and Delahunt (2017) thematic analysis procedure. This procedure used four phases to analyze data:

Phase 1: Familiarization with data to generate initial codes. This required the researcher and peer reviewers to read and re-read the entire body of data to take notes and jot down any early impressions. Then organize the data by categorizing and coding data into a meaningful and systematic way on an excel spreadsheet.

Phase 2: Search for themes. Themes are patterns that capture something significant or interesting about the data and/or research question. Maguire and Delahunt (2017) shared during this process "there are no hard rules about what makes a theme. A theme is characterized by its significance."

Phase 3: Review of themes. During this phase, researchers review, modify, and develop preliminary themes identified in phase 2. At this point, themes should be coherent and distinct from each other.

Phase 4: Define and name themes. The final step is to, "...identify the 'essence' of what each theme is about," (Maguire & Delahunt, 2017). The peer reviewers and researchers defined and gave names that provided a full sense of the theme and its importance.

### **7.4. Coding**

In the study, coding was conducted through a structured process that involved multiple phases to ensure a comprehensive analysis of the qualitative data collected from students' responses to discussion prompts. Initially, the researchers, along with two peer reviewers, familiarized themselves with the data by reading and re-reading the responses, taking notes, and generating initial codes that captured key ideas and themes (Creswell, 2008; Maguire & Delahunt, 2017). The responses were then organized into a Microsoft Excel spreadsheet, allowing for flexible categorization of the data. In the second phase, the researchers identified patterns and themes by searching for significant or interesting elements that aligned with the research questions (Maguire & Delahunt, 2017). During the review of themes, the researchers refined these categories to ensure they were coherent and distinct, leading to the final phase, where they defined and named each theme based on its essence (Maguire & Delahunt, 2017). This systematic approach to coding not only facilitated a deeper understanding of the data but

also ensured the reliability of the findings through collaborative review (Creswell, 2008; Maguire & Delahunt, 2017).

## 8. Findings

**RQ1/Theme 1: Impact on Learning and Performance.** Results from the first research question posted to the discussion forum revealed the overarching theme that AI made an Impact on Learning and Performance. This theme encompassed students' perceptions of AI feedback culminating that AI, "*could influence student learning and performance*" (Anonymous, 2024). At the same time, the use of practice in this setting also confirmed researcher's belief that most educators are not comfortable with the implementation of AI in learning as one student revealed, "*I think that using AI's chatbot prompt could be beneficial to a student's performance, however, I also see that it could become a challenge for the student to strictly use it for feedback. I know in the district I currently work, ChatGPT is blocked from all student computers. They do not have access to it,*" (Anonymous, 2024).

Several subthemes emerged from this theme which are listed from immediate benefits to potential challenges: Students perceived the immediacy of feedback provided by AI chatbots as a significant advantage over the traditional method of awaiting teacher responses. They appreciated that this prompt feedback allows for swift alignment of their writing with the specified criteria outlined in the assignment instructions or prompts, thereby enhancing their ability to meet academic standards. Moreover, students recognized the value of AI-generated feedback in offering precise suggestions for improving their writing, including practical tips and ideas for augmenting their arguments. They believed this guidance could lead to enhanced academic performance by steering them towards producing higher-quality work, which could potentially translate into improved grades. However, students also acknowledged the potential drawbacks of becoming overly dependent on AI feedback. They expressed concerns that excessive reliance on such tools might diminish their engagement with essential academic practices like peer review and the iterative writing process.

Empirical Implication 1: Although the results from the survey reveal students are receptive to using AI Chatbot as part of their learning experience, these results buttressed educator-researchers' belief that critical thinking is still considered necessary and significant in student learning process.

**RQ2/Theme 2: Student Perceptions of AI Chatbot Prompt Feedback.** After analyzing the data from the second research question, the overarching theme was Student Perceptions of AI Chatbot Prompt Feedback. This theme captured varying opinions and experiences regarding the feedback received from AI Chatbot. Researchers and peer reviewers noted positive and negative perspectives which are listed below.

Student responses to AI-generated feedback unveiled a spectrum of opinions, encompassing both positive and negative perceptions regarding its efficacy. On the positive side, many students found the feedback to be a useful and reliable tool that contributed meaningfully to the improvement of their work. For example, one student participant shared, "*I liked the feedback I received after using the AI. It gave me some solid feedback. I think it is a good tool to use if you are trying to get feedback based on a list of requirements. I think it gave me another way to use AI in a useful and honest way,*" (Anonymous, 2024). They appreciated the solid and clear guidance offered by the AI, which bolstered their confidence by ensuring that their writing met the prompt's requirements in a precise and well-articulated manner. Furthermore, students recognized AI Chatbot as a valuable resource for obtaining feedback aligned with a specified set of criteria, viewing it as an honest and practical application of AI

in an academic context. The prompt feedback was cited as being so valuable that even one participant stated, *I found the prompt feedback to be extremely helpful. AI offered excellent suggestions for improving my work, and I added information to my writing based on the feedback I received. I will use this feature in the future*, (Anonymous, 2024). However, not all students shared this enthusiasm unreservedly. Some found the feedback too generic or lacking the depth and nuance that human feedback could provide. This divergence in opinion was also evident when comparing AI feedback to that of human reviewers. While some students favored AI's ability to reduce anxiety by offering consistent, criterion-based feedback, others preferred human input for its greater insight and personalized attention to their work. As referenced by a student participant, *Getting feedback from a chatbot can be helpful, but it might not always be super insightful. Sometimes it's too general and doesn't understand the student's work as well as a real person would*, (Anonymous, 2024). These varied responses highlight the complex interplay between the perceived benefits of AI tools and the enduring value of human judgment in the educational process.

Empirical Implication 2: Students found an appreciation for the Chatbot prompt feedback as it helped build most of the participants confidence and writing skills, however, a computer-generated tool can never replace the need for human contact and interaction in students' learning experience.

**RQ3/Theme 3: Impact of ChatGPT on Writing.** The third research question revealed the overarching theme The Impact of Chatbot Technology on the Writing Process. From this question, the theme highlighted the complex relationship between technology and writing, acknowledging both the advantages and limitations of integrating Chatbots into the writing process. Starting from the greatest to the least, student responses revealed the impact of Chatbot on student writing performance. Students believed the following variables would play a role in the writing process.

Students identified several challenges associated with the use of AI chatbots in their academic work, the foremost being, *'I think this tool would be tempting to copy or rephrase ideas from AI than employing those ideas as a springboard for original thought.'* This concern was closely tied to the potential impact on critical thinking, with students expressing apprehension that excessive reliance on chatbots might undermine their ability to engage in independent analysis and intellectual development. The risk of substituting AI-generated feedback for their own analytical efforts could, they feared, lead to a diminishment of critical thinking skills over time. Additionally, students noted difficulties in integrating AI suggestions into their work, particularly given the often generic nature of the feedback provided by chatbots, which might not address their specific needs. They also pointed out the challenge of relevance and complexity, with AI sometimes struggling to align its responses with the appropriate

Despite these challenges, students also acknowledged significant benefits associated with using AI chatbots. The most notable advantage, according to student participants, was the chatbot's ability to assist in brainstorming ideas and expanding upon existing thoughts within a given topic. This capability was seen as particularly useful in sparking creativity and generating diverse perspectives that students might not have considered independently. Furthermore, students appreciated that AI could prompt further research, guiding them towards resources and concepts that could enhance the depth and quality of their writing. These benefits underscore the dual nature of AI tools in education, offering valuable support while also necessitating careful consideration of their impact on fundamental academic skills.

Empirical Implication 3: From the survey results, it is apparent participants of this study have thoughtful concern about relying on AI Chatbot to teach writing without the interjection and voice of an educator. There are many areas expressed by the participants that educators are needed and cannot be replaced in the classroom. Students still need to learn to think about topics creatively and critically and this can only happen by educators challenging students to think beyond the superficial idea of a topic. Additionally, these results support the findings that it is important to include information about AI in education for all students and provide training for educators.

**RQ4/Theme 4: Balancing Assistance and Autonomy.** The last research question revealed the following theme The Role of AI in Writing: Balancing Assistance and Autonomy. This theme captured the idea that there is a need to balance its use with the development of students' independent thinking and creativity. It highlights the importance of using AI as a tool to assist in writing without relying on it too heavily, and the need for educators to teach students how to effectively use AI tools in their writing process. Based on the responses, the results revealed positive and negative sentiments about having accessibility to AI. Student responses highlighted the potential benefits of AI in terms of specificity and customization, emphasizing that AI feedback can be tailored to each unique piece of writing, thus providing students with targeted avenues for exploration and improvement. This adaptability of AI tools was seen as an asset, offering students the opportunity to receive feedback that is closely aligned with the particularities of their work. Furthermore, students acknowledged the educational value of AI, noting its *potential to enhance learning and writing skills*, particularly when integrated with other educational tools and resources. One participant said, *“Using AI in conjunction with traditional learning methods will help students’ overall academic development.*

However, students also cautioned against the improper implementation of AI in educational settings. They expressed concerns that *reliance on AI, if not carefully managed, could negatively impact self-confidence, leading to overthinking and self-doubt as students might second-guess their abilities in favor of AI-generated suggestions.* This underscores the importance of balancing AI use with the development of independent thinking and creativity. Students stressed the necessity of using AI as a supportive tool rather than a crutch, advocating for an approach that encourages self-reliance and the cultivation of personal insight and originality in writing.

Empirical Implication 4: Based on the results from the study participants, implementing AI feedback in a way that emphasizes specificity and customization can enhance students' perception of the tool's accessibility. This approach can offer students new avenues to explore in their writing, potentially leading to improved learning outcomes. Utilizing AI alongside other educational tools and resources can enhance students' learning and writing skills development. This implies that educators should consider integrating AI into their teaching practices to enhance student learning experiences. At the same time, incorrect implementation of AI could lead to negative impact on student self-confidence, such as overthinking and second-guessing. Therefore, educators should be mindful of how AI is implemented to avoid these negative effects. Students in this study expressed the need for balancing AI use with independent thinking and creativity. Educators should guide students on how to use AI as a tool without relying on it too heavily, ensuring that it complements, rather than replaces, their own cognitive processes.

## **9. Discussion/Implications**

Upon analyzing the results, the findings shed light on the impact AI could have on post-secondary students' performance enrolled in online courses. The results confirmed previous studies on students' positive attitudes toward engaging with AI in education, but this study extended the discussion by also sharing student concerns regarding AI providing generic feedback, which may disarm students' ability to independently think critically. By implementing AI in the curriculum, four key implications and stakeholders were discovered: pedagogical consideration, professional development, curriculum design, and ethical consideration.

The first implication primarily impacts students, as they are the ones experiencing the integration of AI in their learning process. As research findings have shown, post-secondary students are generally receptive to AI, finding it both engaging and influential in their writing processes. However, while the integration of AI enhances student learning and writing skill development, there must be a balance to ensure AI does not inhibit critical thinking or stifle creativity. This balance can be achieved by combining AI feedback with traditional instructional strategies and fostering independent writing skills. Despite these benefits, there are potential challenges, such as the risk of over-reliance on AI tools, which could diminish students' autonomy in the writing process. Further research is needed to examine the long-term effects of AI on students' critical thinking development, as this study was limited in scope regarding longitudinal outcomes. It would be beneficial to explore whether prolonged use of AI tools fosters or diminishes students' ability to engage critically with their writing over time.

The second implication centers on the need for professional development for educators. As previous researchers have argued, providing training opportunities equips educators to integrate AI effectively in their teaching. This not only helps teachers use AI feedback confidently but also empowers them to teach students how to use AI ethically and responsibly. However, the study was limited by a lack of exploration into the varying levels of comfort and expertise among educators when using AI, which could impact the effectiveness of AI integration. Future research should investigate the specific challenges educators face when adopting AI technology, including potential resistance due to unfamiliarity or ethical concerns. Moreover, addressing these challenges will be crucial in developing effective professional development programs that accommodate educators at different stages of technological proficiency, ensuring they are well-prepared to utilize AI tools in the classroom.

The third implication focuses on curriculum design, suggesting that AI can help reduce students' reliance on teachers for feedback. This impacts curriculum developers, as they need to consider how AI tools can be integrated to accommodate diverse learning needs, including those of students with different proficiency levels, disabilities, or language barriers. While the findings are promising, the study did not delve into how AI integration may impact different student populations. For instance, further research should examine how AI tools affect students with varying proficiency levels, learning disabilities, or language barriers. Understanding how diverse learners interact with AI could inform curriculum adjustments to meet individual needs. Additionally, there is a need for research into the potential limitations of AI feedback, such as its inability to address deeper conceptual misunderstandings, and how these limitations might shape overall student performance. Recognizing these challenges will be essential for curriculum developers to create effective and inclusive educational experiences.

The final implication addresses ethical considerations and the long-term impact of AI on student independence and critical thinking. Educational institutions and policymakers are crucial stakeholders, as they need to establish guidelines and frameworks that mitigate risks associated with AI use, such as bias and diminished originality in student work. While this

study provides valuable insights into the integration of AI in education, it is limited in its exploration of AI's long-term impact on student independence and critical thinking. Future research should also address ethical concerns, such as the potential for AI to perpetuate bias or reinforce generic patterns in student writing, thereby diminishing originality. Expanding research to consider these broader implications would contribute to a more comprehensive understanding of AI's role in education and guide educators in using AI as a tool for meaningful learning rather than as a crutch.

Based on the study's implications for integrating AI into the researcher's teaching practice, the findings suggest the researcher could improve student writing instruction and support student learning by effectively integrating AI tools into the online platform. However, ongoing research is needed to assess the long-term impact of AI integration on student outcomes and ensure it is used to enhance rather than replace essential pedagogical practices.

## **10. Conclusion**

Whether educators like it or not, today's students have access to a plethora of AI resources, and they have found ways to use them to their advantage. Some students use AI as a private writing tutor, while others treat it as a writing assistant. Either way, it is essential for educators to recognize and harness the potential of AI to enhance teaching and learning in the classroom.

As this study has uniquely highlighted, while previous research has confirmed students' positive attitudes toward AI, this study contributes a deeper understanding of student concerns regarding the over-reliance on AI and its potential to hinder critical thinking. This insight expands the current conversation in the field by emphasizing the need for a balanced approach to AI integration, one that enhances learning without compromising students' ability to think independently.

Grounded in constructivist learning theory, this study suggests that AI tools can be powerful scaffolds in the learning process, allowing students to actively engage in self-directed learning and reflection. However, the role of AI should be to complement, not replace, the cognitive processes essential for critical thinking and problem-solving. The findings underscore the importance of ensuring that AI is integrated in ways that promote active knowledge construction, rather than passive reliance on technology.

Additionally, the study highlights three critical areas for AI integration: pedagogical approaches, professional development for educators, and curriculum design. These findings provide concrete, actionable recommendations that fill gaps in existing literature, offering educators a roadmap for thoughtfully incorporating AI into their teaching practices. Unlike other studies, this research sheds light on the professional development needs of educators, which are crucial for the successful implementation of AI in classrooms. This contribution adds practical value by addressing a common barrier—educators' unfamiliarity with AI tools—and offering solutions through ongoing professional support.

Moreover, the study introduces a forward-looking perspective on the ethical use of AI, advocating for teaching students how to critically evaluate AI-generated content and use the technology responsibly. This aligns with growing concerns about the accuracy and bias of AI tools, positioning this research as a critical voice in ensuring AI's ethical integration into education. By addressing both the benefits and challenges, the study provides a more holistic view of AI's role in education, something that future researchers can build upon in longitudinal studies to track AI's long-term impact on student learning outcomes.

In conclusion, this study uniquely contributes to the evolving discourse on AI in education by not only confirming its benefits but also raising awareness of potential drawbacks. By framing the findings within constructivist learning theory, the study emphasizes the role of AI as a tool for enhancing active learning, critical thinking, and ethical responsibility. As AI continues to evolve, these insights will be pivotal in shaping how both students and educators navigate the opportunities and challenges it presents

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