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Leveraging AI Tools in Academic Writing: Insights from Doctoral Students on Benefits and Challenges

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Abstract

This study explores the application of artificial intelligence (AI) tools such as ChatGPT, Google Gemini, and Microsoft Copilot in enhancing academic writing and critical thinking among doctoral students at a historically Black college and university (HBCU) in the United States. Through a qualitative case study approach involving doctoral students throughout a summer semester, data were collected via assignments, written artifacts, and semi-structured interviews. The thematic analysis reveals students' perceptions of the effectiveness of these AI tools in enhancing academic writing and critical thinking skills. Findings highlight the practical benefits, such as improved clarity and efficiency in writing, alongside challenges like occasional inaccuracies and ethical considerations. The study underscores the potential of AI to transform educational practices, advocating for its thoughtful integration to support academic integrity and innovation. Future research should explore more robust error-checking features and personalized learning experiences to maximize the utility of AI in higher education.

Keywords: AI tools, doctoral studies, higher education, educational leadership, research and publication

INTRODUCTION

> *This summer class allowed me to focus on one skill—using AI to improve my work. I've learned that verifying and properly attributing research remains my job. Using AI is no more cheating than transitioning from encyclopedias to Google…. Allowing students to play with AI without reservation has been a valuable lesson for me in this class that I hope more students at all levels of study could benefit from in the current era of AI."*
>
> - *Joy, a doctoral student*

Integrating Artificial Intelligence (AI) in higher education has introduced transformative capabilities that enhance academic writing, critical thinking, and learning experiences. Recent advancements in AI tools such as ChatGPT, Google Gemini, and Microsoft Copilot have shown significant potential in educational settings (Alhur, 2024; Abu Khurma, 2024). This study focuses on these three AI tools, exploring their applications in a community college leadership graduate program to understand their effectiveness and impact on doctoral students' assignments.

AI has revolutionized various aspects of higher education by offering advanced natural language processing (NLP) capabilities, facilitating complex query processing, and automating routine tasks (Rossettini et al., 2024). These tools assist in creating and co-creating academic content and provide critical analysis and enhancement of written work, making them invaluable in academic environments (Hiwa et al., 2024).

This study aims to investigate the applications of ChatGPT, Google Gemini, and Microsoft Copilot in a graduate program. By examining the artifacts produced by students and their perceptions of these tools, the study seeks to provide insights into the practical benefits and challenges associated with integrating AI into higher education. The research questions guiding this study are: (1) How do doctoral students perceive the effectiveness of these AI tools in enhancing their academic writing and critical thinking skills? (2) What are the comparative impacts of these AI tools on the quality of assignments produced?

LITERATURE REVIEW

The use of AI in higher education has been extensively documented, highlighting its ability to transform teaching and learning practices. AI tools such as ChatGPT, Google Gemini, and Microsoft Copilot have emerged as prominent players, each offering unique capabilities and applications (Granito, 2024).

AI Tools in Higher Education: ChatGPT, Google Gemini, Microsoft Copilot

ChatGPT, developed by OpenAI, is renowned for its advanced NLP capabilities that allow it to generate human-like text responses. It has been widely used for virtual tutoring, enhancing student engagement, and providing instant assignment feedback (Tepe & Emekli, 2024). ChatGPT's ability to assist in drafting and refining academic papers has made it a popular tool among students and educators alike (Borović et al., 2024).

Google Gemini, formerly known as Google Bard, is another powerful AI tool designed to handle complex tasks including coding, logical reasoning, and creative project collaboration. It excels in processing and interpreting vast amounts of academic literature, making it a valuable resource for research and information retrieval (Forsén, 2024). Its integration into educational settings has significantly

improved students' research capabilities and overall academic performance (Kaftan et al., 2024).

Microsoft Copilot, integrated within the Microsoft 365 ecosystem, enhances productivity by automating routine tasks and streamlining workflows. It supports educational activities by facilitating interdisciplinary communication, managing clinical documentation, and aiding in developing health applications (Strzelecki, 2024). Its seamless integration with widely used Microsoft applications makes it a practical choice for educational institutions aiming to leverage AI for administrative and academic purposes (Hawley & Hollans, 2024).

The rapid advancement of AI technologies, such as ChatGPT, Google Gemini, and Microsoft Copilot, presents both opportunities and challenges in higher education. ChatGPT's conversational abilities enhance student engagement and provide immediate feedback, improving learning outcomes (Hiwa et al., 2024; Rossettini et al., 2024). Google Gemini's robust data processing capabilities support research-intensive tasks, allowing students to analyze large datasets effectively (Granito, 2024). Microsoft Copilot's integration with Microsoft 365 applications streamlines academic and administrative tasks, promoting efficiency and productivity (Borović et al., 2024). However, these AI tools also pose significant challenges. Data privacy is a major concern, as AI tools require access to substantial amounts of personal information to function effectively (Alhur, 2024). Algorithmic bias is another critical issue, as AI systems can perpetuate and exacerbate existing biases in data (Tepe & Emekli, 2024). Addressing these challenges requires a comprehensive understanding of AI tools' capabilities and limitations, alongside a commitment to ethical standards and regulatory compliance.

Human Perception of AI-Generated Text

O'Boyle (2024) explored human perceptions of AI-generated text, revealing that participants rated expository texts from ChatGPT similarly to those from Wikipedia regarding accuracy and well-writtenness. However, creative texts from ChatGPT were rated lower for buyability and creativeness compared to texts labeled as human-written. This suggests a general perception that AI tools like ChatGPT excel at generating factual, expository content rather than creative writing. This perception aligns with Keser (2024), who found that stakeholders in a university First-Year Writing program had positive or neutral attitudes toward AI tools but noted slight differences in familiarity between domestic and international participants.

This dichotomy in perception is further complicated by the transparency issues surrounding AI content generation. As noted by Reed (2023), awareness of AI authorship did not significantly reduce engagement or creativity evaluations in AI-generated stories. The timing of disclosing AI authorship also did not influence expectations of AI's capabilities. However, the expectation violations correlated with engagement and creativity assessments, suggesting that people's expectations of AI capabilities influence their perceptions of AI-generated content.

Understanding these perceptions is crucial for educators and developers aiming to integrate AI tools effectively into educational settings. According to Dorgbefu (2024), both students and faculty recognize ChatGPT's resourcefulness but also express concerns about its impact on cognitive, writing, and thinking skills and creativity.

Chacko (2024) examined the implications of Generative Artificial Intelligence (Gen-AI) on design education, highlighting both creative opportunities and efficiency gains through automation offered by tools like ChatGPT, DALL-E, and Midjourney. These tools alter traditional multi-step design processes, raising questions about the relevance of current design pedagogy. The research emphasized the need for a balance between technical skills and interdisciplinary design approaches, suggesting that Gen-AI could bridge the gap by automating technical processes and allowing more focus on interdisciplinary skills. This shift in pedagogy reflects broader trends in higher education, where the integration of AI tools is reshaping how subjects are taught and learned.

In a related study, Parada Rincon (2024) explored AI resources for boosting speaking and listening skills in ESL learners. The study proposed using AI tools and applications to enhance language learning, offering strategies and recommendations for educators. This approach aims to address the unique needs of ESL students and leverage AI's potential to improve language acquisition. Scott (2024) also conducted a pilot study on using ChatGPT to aid in concert band music selection. The study aimed to make it easier for conductors to find repertoire by composers from underrepresented communities by integrating a ChatGPT widget with The Wind Repertory Project database. This approach demonstrates AI's potential to support diverse and inclusive music education practices.

Ethical Integration of AI Tools

The ethical use of AI tools in universities has become increasingly essential as institutions embrace these technologies to enhance learning and streamline administrative processes. AI tools, such as ChatGPT, offer valuable support in drafting academic papers, analyzing data, and providing tutoring support, but their implementation must prioritize ethical considerations to prevent unintended consequences. If unchecked, Bender et al. (2021) caution that AI systems can reinforce existing biases, perpetuate systemic inequalities, and even impact student development by providing unnuanced or biased responses based on underlying data. For instance, if an AI tool trained on limited or culturally homogeneous data is used to provide feedback on student writing, it may inadvertently favor certain linguistic styles or perspectives, disadvantaging students from diverse backgrounds. Academic institutions should adopt clear guidelines for AI usage, including regular audits of AI systems for biases, transparency around AI capabilities, and proper training for students and faculty on using AI responsibly. By fostering a culture of ethical AI usage, universities can harness the benefits of

these tools while promoting fairness, academic integrity, and inclusivity across diverse educational settings.

Students express concern that excessive dependence on AI could undermine the value of higher education, while a report emphasizes that AI has become the 'new standard,' urging universities to improve policy communication (Rowsell, 2024). The Digital Education Council Global AI Student Survey 2024 provides comprehensive insights into student perceptions of AI in higher education. Gathering responses from 3,839 students across 16 countries, the survey covers AI usage, readiness, student expectations, and institutional adoption. It highlights key areas of concern, valuable AI use cases, and student sentiment to guide university decision-making. The survey aims to inform leadership on effectively integrating AI while addressing potential liabilities and student concerns (Digital Education Council, 2024).

In short, AI tools like ChatGPT, Google Gemini, and Microsoft Copilot offer significant benefits in higher education, but their integration must be managed carefully to address challenges such as data privacy and algorithmic bias. Understanding human perceptions of AI-generated text, as well as the specific needs of design education, ESL learning, and creative fields, is crucial for maximizing the potential of these tools. Continued research and ethical considerations will be vital to ensuring that AI tools are used responsibly and effectively in educational settings. As the line distinguishing human-written and AI-generated content continues to blur, transparency and a deeper understanding of AI's capabilities and limitations will be essential for fostering trust and ensuring the effective use of these technologies in higher education.

RESEARCH METHOD

A case study approach was used for this research to provide an in-depth exploration of the integration of AI tools in a graduate program. Yin (2018) defines a case study as an empirical inquiry that investigates a contemporary phenomenon within its real-life context, mainly when the boundaries between phenomenon and context are unclear. This method is especially suitable for understanding complex educational environments and the nuanced interactions between students and emerging technologies (Stake, 1995). Focusing on seven doctoral students enrolled in a community college leadership program, the study aimed to capture rich, detailed data on their experiences and perceptions of AI integration in their coursework.

Data Collection and Analysis

Data were collected from multiple sources to ensure a comprehensive understanding of the participants' experiences. These sources included assignments, written artifacts, and semi-structured interviews. Using multiple data sources, known as triangulation, enhances the credibility and validity of the

findings (Denzin, 2009). The analysis involved thematic coding, a qualitative data analysis method that identifies patterns or themes within the data (Braun & Clarke, 2006).

The coding process began with an initial reading of all collected data to familiarize with the content. This initial stage allowed the researchers to immerse themselves in the data, gaining a holistic view of the participants' responses. Following this, initial codes were generated, capturing significant data features relevant to the research questions. These initial codes were then organized into potential themes. Each theme was reviewed and refined to ensure it accurately reflected the coded data and aligned with the research objectives. The thematic analysis provided a systematic approach to identifying and interpreting patterns within qualitative data, ensuring a detailed and nuanced understanding of the students' experiences (Braun & Clarke, 2019).

Course and Case Study Implementation

The course was meticulously designed to incorporate AI tools into various assignments, ensuring a seamless blend of traditional learning with innovative technology. The course structure was outlined with clear learning objectives and pedagogical strategies tailored to enhance student engagement and maximize the benefits of AI integration. Resources provided to the students included journal articles and dissertations related to the role of technology in community colleges and universities and lecture presentations. Zoom sessions with guest speakers were also conducted to provide expert insights into AI applications in education. These sessions took place on July 8, July 15, July 22, and July 29, providing a platform for students to interact with thought leaders and gain deeper insights into the practical applications of AI in their field.

Assignments required students to practically and ethically explore AI tools such as ChatGPT, Google Gemini, and Microsoft Copilot. For instance, students were tasked with generating professional bios and dissertation outlines using these tools. Specific instructions were provided for each task, such as creating accounts on the AI platforms, using prompts to generate content, and compiling the outputs into a single document for comparison. This hands-on approach encouraged students to expand their ideas and utilize their creativity, allowing them to engage directly with AI technologies. There were multiple assignments throughout the semester that involved writing 1800 to 2400 words articles on a wider range of topics such as predictive analytics in post-secondary institutions, disruptive technological innovation, campus technologies, analysis of AI on-campus guidelines from the selected US universities, the Internet of things in education where students had to incorporate personal experiences and module readings to provide a first-person account of the challenges and successes in using data analytics in education.

This methodology allowed for a rich, detailed analysis of student experiences, offering valuable insights into the educational implications of AI technology. The

structured course design, and integration of expert insights through guest lectures, and practical assignments ensured that students could fully explore the potential of AI tools, enhancing their academic and professional development.

Theme 1: Enhancement of Academic Writing Skills

Initial Perceptions and Learning Curve

This theme focuses on how students perceive the AI tools' ability to improve their academic writing. Key aspects explored include clarity and coherence of writing, grammar and style enhancements, and the ability to structure arguments and ideas effectively. Feedback on whether these tools have made students feel more confident in their writing abilities is also considered.

Some doctoral students dealt with the initial experiences and learning curve of students as they started using AI tools. Nita talked about her experience:

> "As a newcomer to AI tools, my journey is rapidly evolving. Prior, I was a novice with ChatGPT and had no experience with AI platforms like Gemini or Microsoft Co-Pilot. I can see where the use of such could be helpful to outline and explore topics for research. I can also see where the tools could be helpful with processes and projects (descriptors of job title, roles, operations, and in some situations, portions of grant writing). Despite being a novice, the user-friendly interface and quick responses have made it easy to navigate. I am both eager and excited to continue learning and discovering new ways AI can support my personal, academic, and professional growth."

Lina found AI tools useful for generating comprehensive responses and brainstorming ideas, aiding in the refinement of academic work.

> “I found using ChatGPT and its ability to generate comprehensive responses and provide detailed explanations extremely helpful. It served as a valuable resource for brainstorming ideas, drafting initial versions of assignments, and clarifying complex concepts. For example, when I struggled to frame a research question for my dissertation, ChatGPT offered insightful suggestions that helped me refine my focus."

Joy highlighted the practical benefits and time efficiency gained through the use of AI tools in her coursework:

> "This semester, I extensively used a generative AI tool, primarily ChatGPT, for all my assignments. I also experimented with AI products from Microsoft and Google, finding them quite similar. ChatGPT became my tool of choice for its familiarity and efficiency in making my writing clearer and more concise.

> With no restrictions, I frequently used ChatGPT to edit my writing. I would jot down my thoughts in a Word document and then instruct ChatGPT to transform the content into an essay. This approach allowed me to start with ideas and structure rather than a blank page. The more I would tailor the prompts and edit the output for grammar, structure, and content, the better my writing would become. While I didn't initially use AI for creating outlines, the assignments highlighted their importance. Going forward, I plan to use ChatGPT to help me become a better outline writer."

Theme 2: Perceived Benefits /Development of Critical Thinking Skills

This theme examines the role of AI tools in fostering critical thinking among doctoral students. It explores the extent to which AI tools help in analyzing and synthesizing information, encourage reflective thinking, and promote deeper engagement with content, with a comparison across different AI tools.

Rhonda acknowledges the significant potential of AI tools in enhancing productivity, particularly in generating comprehensive responses and providing detailed explanations for academic work. She said:

> "I found using ChatGPT and its ability to generate comprehensive responses and provide detailed explanations extremely helpful. It served as a valuable resource for brainstorming ideas, drafting initial versions of assignments, and clarifying complex concepts."

Francis talked about some practical benefits of AI tools, including assisting with tasks, boosting productivity, and processing large amounts of information. He also notes a preference for Google Gemini due to its accuracy and data processing capabilities:

> "AI tools can assist with various tasks, including answering questions, providing explanations, offering recommendations, and engaging in discussions on various topics. They can also demonstrate superior problem-solving skills and process large amounts of information. AI can make tasks quicker and easier, boosting productivity. I prefer Google Gemini to the other AI tools (ChatGPT and Microsoft Copilot) because it has fewer errors and can process more data."

Lina talks about the perceived benefits and potential drawbacks of using AI tools in academic settings, as discussed in the quote.

> "AI tools are a valuable resource for doctoral students in their dissertation writing journey. They grant access to information, enhance writing quality, and boost research capabilities. However, it's essential for students

to use these tools thoughtfully, understanding their strengths and limitations, to truly improve their academic writing process."

She added:

"I chose, um, ChatGPT because I found it more beneficial in helping me, um, generate my ideas as well as help my critical thinking skills. Um, one example, I would say it provide clarity and coherence for and as well as suggested additional research because you I still found I had to go back and verify the information that ChatGPT put in, as well as personalize it, because it is gathering that information from the web."

Nita said:

"I see the benefit of having a multi-layered resource, that I can explore, even if I'm doing simple, mundane tasks from crafting forms, editing, minutes, correspondence, outlining our researching and pulling up different sources, and, layering the sources. Then I use my fact-checking sources, my spelling, and grammar-checking sources. I find that it saves time. I find that it adds to the exploration of the research. I don't see it as a distraction, and I don't see any further ethical concerns that I already employ in my research, studies, and writing. So I just see it as a tool that can help others all along the platform of lifelong learning."

Theme 3: Quality of Assignments Produced

This theme focuses on the comparative analysis of assignments produced using ChatGPT, Google Gemini, and Microsoft Copilot. Key areas include the overall quality and academic rigor of the assignments, creativity, and originality in the produced work, and the comparative effectiveness of each tool in aiding the completion of high-quality assignments.

Joy discussed the distinct characteristics and strengths of each AI tool in terms of their output, tone, detail, and style, as well as the user's preferences and ethical considerations. She said:

"When comparing the outputs from the three AI tools, several distinctions arose. ChatGPT was clear, concise, and practical. It excelled in providing intuitive formal responses. This class assignment also minimalized my ethical concerns about AI because it became clear that output depends so much on tool choice, input, and editing."

The journey with AI tools was marked by excitement and apprehension, with students expressing initial uncertainty about AI but gradually recognizing its practical applications and overcoming fears about its use. Rhonda shared:

> "One significant 'aha' moment was realizing how Dr. ___'s course design itself leveraged AI to facilitate learning. This integration helped me understand AI's practical applications and mitigate my fears about its use. I am eager to utilize AI to streamline and enhance my research and academic work…, particularly in managing data and generating content. I also gained valuable insights from guest speakers, particularly one who discussed the biases inherent in AI tools, highlighting the need for further research and focus on these issues to ensure inclusivity in algorithmic outcomes."

Theme 4: User Experience and Accessibility

This theme captures the usability and accessibility of each AI tool from the students' perspectives. Areas of focus include the ease of use, the learning curve associated with each tool, accessibility features, user support, and student preferences and satisfaction levels with the tools.

Doctoral students shared their experiences of the user-friendliness of ChatGPT compared to Gemini and Microsoft Copilot, highlighting each tool's limitations and strengths in creating professional bios and generating dissertation outlines (assignments). For example, Rhonda said:

> "ChatGPT proved to be the most user-friendly AI tool for creating my professional bio. In contrast, Gemini and Microsoft Copilot were less user-friendly, primarily due to limitations in character count that prevented capturing my entire CV. Despite this, all three AI tools promptly generated the dissertation outline, which produced very similar results."

The integration of AI tools elicited mixed feelings of excitement and apprehension, highlighting the importance of balancing AI use with traditional learning methods. Lina says:

> "Emotionally and cognitively, my journey with AI tools has been a mix of excitement and apprehension. A significant concern is the potential over-reliance on AI, which might hinder critical thinking and creativity. However, an 'aha' moment for me was realizing how these tools can be leveraged to complement, rather than replace, traditional learning methods. By using AI to handle routine tasks, I found more time to engage in deeper analytical thinking and reflection, which enriched my academic experience."

Francis said:

> "I would say I would still stick to efficiency and time savings on it. And also, because it can provide you information, very general information,

very quickly and help you make quick decisions. Also, another important benefit is the improved writing quality. It can do error corrections for you. Grammar corrections like like you're using Grammarly or something like that. So that's one of the benefits that I think. But in terms of challenges one thing I think is maybe the quality and the accuracy concerns, something like that, You know, is it coming from the the information that you're kind of researching about, uh, is it giving you the correct information? That's one of the, um, concerns or challenges that I think in there and also, um, maybe some ethical or academic integrity, some such. So that's what I think."

Theme 5: Practical Challenges and Ethical Considerations

This theme addresses the practical and ethical challenges of integrating AI tools in higher education. It includes technical issues and limitations encountered, concerns about academic integrity and originality, and the ethical implications of AI-assisted writing and its acceptance in academic settings.

Roger shares his initial hesitation to use AI tools due to negative media branding and concerns about cheating, which are ethical considerations. Additionally, it mentions the practical value found in Microsoft Copilot, which aligns with discussing the practical challenges and differentiators of the tools.

> "I was not familiar with the Chat GPT, Google Gemini, and Microsoft Copilot Artificial Intelligence (AI) tools. I did shy away from utilizing these tools because of the negative branding of these tools in the news media. The word cheating is often labeled with AI tools as opposed to helpful tools to gather information or produce a useful document to share with others. My conclusion is Microsoft Copilot offers a capability that I value and differentiates from Chat GPT and Google Gemini. The ability to gather information and quickly create and formulate into a consumable product is a clear differentiator."

He adds:

> "One significant hurdle was ensuring that I provided sufficient and precise input to elicit substantive information from the AI. I often found myself needing to guide the AI tool more than anticipated to obtain the desired results. While the AI tools' capabilities were impressive, I harbored fears about not providing accurate citations and inadvertently committing plagiarism."

Despite their benefits, AI tools often presented inaccuracies and could not understand nuanced academic contexts, requiring users to verify information. Lina says:

> "Despite these advantages, there were also challenges and limitations. One significant area for improvement was the occasional inaccuracy of information provided by ChatGPT. I often had to cross-check facts and data, which sometimes negated the time-saving aspect. The AI's inability to understand the nuanced context of specific academic queries also led to irrelevant or superficial responses. Another limitation was the lack of personalized feedback, crucial for academic growth and improvement."

AI tools were recognized for their ability to increase efficiency, allowing students more time for deeper analytical thinking and reflection. Lina adds:

> "My overall experience with AI tools in this class has been transformative. While there are areas for improvement, the benefits they offer in terms of efficiency and support are undeniable. By using AI to handle routine tasks, I found more time to engage in deeper analytical thinking and reflection, which enriched my academic experience."

There is a need for more robust error-checking and bias-detection features in AI tools, along with customizable options and comprehensive training resources to improve their utility and applicability in academic and research contexts. Rhonda summarizes it:

> "To enhance the utility of AI tools for students and scholars, I suggest incorporating more robust error-checking and bias-detection features to ensure the reliability and accuracy of AI-generated outputs. Customizable options for integrating AI tools into specific academic or research contexts would also improve their flexibility and applicability."

One challenge noted by Joy was the occasional misalignment between the AI's output and her expectations:

> "One challenge I faced with AI was that sometimes the output didn't align with my expectations. Additionally, ChatGPT's paragraph structuring is often too short and choppy. It is also no secret that ChatGPT is not a unique voice or an award-winning crafter of prose. It simply helps you get a little further than you would on your own in my opinion by lessening the barriers of writer's block and ambiguity. I do not recommend it for the research part of the process because it is outdated. For research, I found tools like ChatPDF or R Discovery more reliable."

As a doctoral scholar and teaching assistant at the university, Joy highlights the practical benefits and future integration of AI tools in education. She emphasizes that AI tools enhance rather than replace scholarly responsibilities, and she plans to continue using these tools in her future academic endeavors. She said:

"My key takeaway from this semester's doctoral course is that using AI doesn't replace my responsibilities as a scholar but enhances my ability to convey ideas clearly and efficiently. This summer class allowed me to focus on one skill—using AI to improve my work. I've learned that verifying and properly attributing research remains my job. Using AI is no more cheating than transitioning from encyclopedias to Google. I plan to continue using tools like ChatGPT, R Discovery, and MyBib in future assignments and my dissertation.

I'm so impressed with the benefits of AI in education that I plan to introduce these tools in the class I'm teaching this fall. Speech lends itself well to practice with AI-assisted content. Allowing students to play with AI without reservation has been a valuable lesson for me in this class that I hope more students at all levels of study could benefit from in the current era of AI."

DISCUSSION AND CONCLUSION

This section interprets the findings in the context of existing literature. It discusses the practical implications for community college leadership programs and addresses potential challenges and considerations for integrating AI tools in higher education.

The advent of AI tools such as ChatGPT, Google Gemini, and Microsoft Copilot has significantly transformed higher education by enhancing both teaching and administrative processes. AI tools like ChatGPT, with their advanced natural language processing capabilities, aid in content creation, personalized learning, and automated administrative support. Google Gemini and Microsoft Copilot offer real-time data analysis, project management, and interactive learning modules. Studies, such as those by Abu Khurma et al. (2024), Chacko (2024), and Reed (2023), reveal that these tools streamline design processes and augment traditional teaching materials, fostering a more engaging learning environment. However, as highlighted by Dorgbefu (2024) and Keser (2024), there are mixed perceptions among students and faculty regarding AI's impact on critical thinking and creativity, underscoring the need for balanced integration where AI supports but does not replace fundamental educational practices.

Methodological insights from qualitative case studies, like those by O'Boyle (2024), indicate that while AI generates factual and structured content, human creativity remains unmatched in creative outputs. Parada Rincon (2024) emphasizes equipping teachers with AI resources to enhance language skills, suggesting proactive integration in curriculum development. As AI continues to evolve, its role in higher education will likely expand, offering new opportunities for innovation (Hiwa et al., 2024). However, maintaining transparency about AI functionalities and providing adequate training for educators and students is crucial

to harnessing AI's full potential while addressing its challenges. This balanced approach is essential for leveraging AI technologies to transform educational practices and better prepare students for future workforce demands.

The findings from this study offer significant insights into the development of policy frameworks for AI integration in higher education. The experiences of doctoral students in leveraging AI tools, such as ChatGPT, Google Gemini, and Microsoft Copilot, highlight both the productive and challenging aspects of AI use in academic settings. Policies could be developed to balance the benefits of these tools with academic integrity concerns, addressing areas like proper citation, verification, and responsible AI use in student research. Given that doctoral students often handle more complex research and writing tasks, they may benefit from clear guidelines on how AI can ethically assist rather than replace critical thinking and originality in their work. Additionally, institutions could consider introducing mandatory training on AI ethics and practical usage as part of the doctoral curriculum. This would not only prepare students to use these tools responsibly but would also foster a culture of innovation supported by AI, rather than one dominated by reliance on it.

Doctoral students' experiences with AI tools differ from those of undergraduate or master's students, primarily due to the depth and rigor required in doctoral research. Unlike undergraduate students, who might use AI tools for foundational support in assignments, doctoral students rely on these tools to enhance specific aspects of their dissertation work, such as refining research questions, structuring arguments, and managing vast data sets. Future research could examine these differences in depth, focusing on how AI tools impact learning outcomes and the development of critical skills across educational levels. Furthermore, the potential for AI biases, especially when these tools are trained on data that may not represent diverse perspectives, presents a notable challenge in multicultural academic environments. To address this, institutions might consider measures such as promoting AI tool audits to identify biases and implementing strict guidelines on ethical use to maintain a balanced approach.

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