IMPACT OF ARTIFICIAL INTELLIGENCE (CHATGPT AND GOOGLE-BARD) ON UNDERGRADUATES' CREATIVE WRITING SKILLS AT A UNIVERSITY IN NORTHEASTERN NIGERIA

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Abstract
Artificial intelligence (AI) has a profound influence on various facets of modern-day society, notably within the realm of education. Its application in educational settings is extensive, primarily aimed at improving the methods of instruction and knowledge acquisition. Thus, this research investigates the impact of AI tools (ChatGPT, Google Bard) on the creative writing skills of Nigerian undergraduates using a pretest-posttest quasi-experimental research design. Eighty (80) third-year undergraduates participated in the study. Data were collected using pretest-posttest writing tasks. The writing scripts were graded using creative writing assessment rubrics. Paired sample t-test analysis was conducted to compare the pretest-posttest writing scores using SPSS. The results of the analysis showed a significant improvement in the participants' overall writing scores after using the AI tools. The results also show significant improvement in all the aspects of creative writing: image, voice, characterization and story. Finally, the study makes some recommendations for practice and further studies.
Keywords: *Artificial Intelligence, Creative Writing, Nigeria Undergraduates*

Introduction

Creative writing is the act of expressing one's thoughts and emotions on a specific subject through unrestricted use of imagination (Oral, 2012). It entails innovative thinking, characterized by the capacity to generate novel, surprising, yet coherent and valuable concepts (Boden, 2001). These new ideas or feelings are connected to existing knowledge or perceptions (Lawwill, 1999; Demir, 2013). The primary objective of creative writing is to educate, convince, and captivate the

audience. It predominantly relies on imaginative prowess rather than strict factual correctness (Minot, 2003) and is commonly associated with three key literary genres: poetry, fiction, and drama.

In the field of language acquisition, particularly in the context of English as a Second Language (ESL) or Foreign Language (EFL), the practice of creative writing serves to enrich students' creativity and linguistic proficiency across various domains of English such as grammar, vocabulary, phonology, and discourse. The development of creative writing abilities assumes a crucial role in promoting the advancement of critical thinking, effective communication, and self-expression among learners. This is primarily due to its distinct utilization of language to articulate personal interpretations and imaginative constructs in an engaging manner. Consequently, individuals are actively immersed in a deeper level of cognitive engagement with the language compared to conventional expository materials (Craik & Lockhart, 1972). Beyond facilitating and enhancing the learning process, creative writing offers diverse avenues for articulating and showcasing acquired knowledge (Everett, 2005). Moreover, creative writing exercises are instrumental in honing a spectrum of skills including cognitive, affective, psychomotor, and metacognitive competencies (Larkin, 2009), while concurrently serving as a medium for the expression of emotions, reflections, and factual content.

However, studies reveal that many Nigerian undergraduates face various challenges with their creative writing tasks. The challenges are due to numerous factors such as poor attitude to rudiments of creativity, limited exposure to diverse writing styles, insufficient personalized feedback, and variations in linguistic capabilities among others (Adegoju & Adeleke, 2019). From experience, most students have a negative attitude and perception of creative writing genres, particularly poetry and drama.

Despite the students' writing challenges, what is more worrisome is the teachers' inability to find effective strategies that can easily arouse students' interest and enhance their creative writing skills. Most of the traditional teaching methods adopted by many teachers in teaching creative writing fail to address the students'

challenges which leads to a persistent disparity in creative writing abilities. Additionally, the limitations in the availability of resources and trained educators compound the challenges faced by students in developing their creative writing skills (Adegoju & Adeleke, 2019).

With the recent integration of digital tools and Artificial Intelligence (AI) in education in many parts of the world, teaching and learning have been greatly improved (Hesham, Dempere, Akre, & Flores, 2023). The literature has shown positive outcomes of Artificial Intelligence (AI) applications in language learning in various cultural contexts (Brown, 2017). AI technologies have revolutionized education globally, offering personalized and interactive learning experiences (Holmes & Bialystok, 2018) including creative writing. Even teachers prefer the use of technology than the traditional manual method of teaching as observed by Permata and Purnawarman (2024) that despite some challenges in the implementation of ICT in classrooms, most Indonesian teachers exhibit a positive attitude towards employing ICT in their teaching.

Although there are various classifications of Artificial Intelligence based on their capabilities and functionalities, one of the categories particularly significant for students of literature is Natural Language Processing (NLP) or Language models. This field is dedicated to facilitating computers in comprehending, analyzing, and producing human language. They are used in a variety of applications, such as machine translation, chatbots, and virtual assistants. Among the well-known language models are ChatGPT, Google Bard, and GPT-3. Nonetheless, for this research, only ChatGPT and Google Bard are utilized due to their popularity among the study participants.

Google AI's Bard is a sophisticated Large Language Model (LLM) that has undergone training on an extensive dataset comprising text and code. Bard exhibits capabilities in generating text, language translation, crafting various forms of creative content, and providing informative responses to queries. On the other hand, ChatGPT is a generative pre-trained transformer model created by OpenAI. This robust language model boasts the ability to produce text, perform language translation, generate diverse creative content, and offer informative answers to questions. Studies

have shown that many students prefer to use these AI tools than others. For example, Hidayati and Nihayah (2024) reveal that most international students prefer to use AI such as ChatGPT or Google Bard AI to translate abstracts from international journal articles into their local languages.

In the field of creative writing, digital tools and (AI) tools have the potential to revolutionize literary education by creating and engaging interactive learning experiences that can help students develop their creative writing skills. It provides instant feedback, and resources, which can benefit students' engagement and writing performance (Hesham, Dempere, Akre, & Flores, 2023). Various studies have reported the benefits of AI tools on students' creative writing skills. For example, Kress et al., (2019) observed more engagement in the writing process among students who used digital tools for creative writing and produced higher-quality work than students who did not use these tools. Li et al., (2020) also discovered that students who received feedback from AI writing assistants revised their writing and made improvements more than others who did not receive the feedback. It has also been observed that students who used AI-powered tools to generate creative text formats were also more creative in their writing (Bateman et al., 2022). In addition, Pratama, and Hastuti, (2024) examined the effectiveness of AI in teaching and writing among high school students using pre-tests, post-tests and surveys to measure English writing skills and students' perceptions of using AI in learning writing. The study discovered the effectiveness of Artificial Intelligence in developing the writing skills of learners as an increase in their writing skills after using AI was observed.

Lee, Davis, and Lee (2024) examined the perspectives surrounding the utilization of artificial intelligence (AI)-based writing tools, encompassing tools guided by machine learning like Google Translate and Naver Papago, as well as generative AI tools such as Grammarly, among Korean undergraduate students utilizing a mixed-method research approach. The outcomes of the investigation demonstrate that students hold favourable views regarding the potential of these tools in enhancing their writing abilities. Moreover, they delineated the specific strengths of each AI-based tool, highlighting factors like the accessibility of translation through machine

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learning and the error-detection capabilities of generative AI. Conversely, they also observed that excessive use of AI-based writing tools might impede the English writing process.

Similarly, Alharbi (2023) scrutinized the application of AI-infused writing assistance tools within educational settings concerning their classifications, functionalities, limitations, and prospects for enriching students' writing proficiencies. The research delved into the perceptions of educators and scholars regarding students' engagement with AI-powered writing tools. The study's results illustrated a growing tendency among students to leverage various AI-powered writing aids to enhance their writing skills. The investigation categorized the AI tools employed by students into four principal groups: (1) tools for automated writing assessment, (2) platforms offering automated corrective feedback on writing, (3) AI-driven machine translation tools, and (4) GPT-3 automatic text generation tools. Furthermore, the research highlighted recommendations made by experts concerning the incorporation of AI-powered writing assistance tools in education, dividing the suggestions into two categories for educators and researchers: integration of these tools into classroom practices and adopting an ecological perspective towards their implementation.

Likewise, Susanto, Woo, & Guo (2023) conducted a study focusing on the use of language models to support the ideation phase of creative writing. The findings of the study indicated that language models fulfil diverse roles in fostering students' creativity, acting as both collaborators and provocateurs. Similarly, Sumakul, Hamied, and Sukyadi (2023) examined students' perceptions regarding the integration of AI in their educational journey. Data was gathered through semi-structured interviews with eight EFL learners who had exposure to an AI application in their writing sessions at a university in Indonesia. The results revealed that the students harboured optimistic views towards the utilization of the AI application, finding it beneficial to their learning and writing endeavours. Furthermore, the study proposed various considerations for the integration of AI tools in writing classes.

Furthermore, Storey (2023) examined the correlation between artificial intelligence (AI) and the acquisition of dissertation writing skills among postgraduate

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students. The investigation delineated the writing obstacles encountered by the students before delving into a comprehensive analysis of AI-generated tools and the writing proficiency necessary to accomplish the five sections of a conventional dissertation.

Additionally, Koos and Wachsmann (2023) delved into the consequences and significance of AI-powered language systems such as ChatGPT/GP-T4 on scholarly paper composition within the sphere of universities and other institutions of higher learning. The research also scrutinized the functions of ChatGPT/GPT-4 in facilitating students and scholars to streamline the writing procedure, surmount language barriers, and amplify efficiency. Furthermore, the study assessed the potential drawbacks of AI-generated content like plagiarism, diminishing critical thinking aptitude, and reduced originality in scholarly writing. Recommendations included reinforcing plagiarism identification methodologies to enhance the proficient utilization of AI tools by students and raising awareness among students and researchers regarding the ethical ramifications of incorporating AI in academic writing endeavours.

In a similar vein, Utami, Andayani, Winarni, and Sumarwati (2023) investigated the attitude towards employing AI in instructing academic writing within senior high schools in Central Java, Indonesia. Data was gathered through surveys and detailed interviews. The outcomes revealed that (1) AI-driven educational resources assist students in academic inquiry, particularly during the planning phase to pinpoint and expand on topics, and in the drafting phase to formulate a preliminary paper, (2) AI-powered educational resources are viewed as adaptable in accessibility despite their inability to address all student requirements in the writing process, (3) students exhibit enthusiasm towards leveraging AI technology in academic writing classes to inject vitality into the learning experience.

However, in Nigeria, artificial intelligence (AI) tools are barely utilized in the teaching and learning of creative writing as research on the use of AI on students' creative writing skills is still in its early stages. Despite the potential benefits of AI tools in second or foreign language learning, there is limited empirical research on their impact on creative writing, particularly in Nigeria. This is mostly because research on

the effects of AI on students' creative writing skills is still in its early stages globally. Therefore, this research investigates the impact of AI tools on Nigerian students' creative writing skills to fully understand the potential benefits and risks of these tools on students' creative writing skills and make recommendations for improvement. The study is guided by the following research question: What is the impact of AI tools on students' creative writing skills?

Method

This research employs a pretest-posttest quasi-experimental design to examine the impact of artificial intelligence on the creative writing abilities of undergraduate students in Nigeria. This design was chosen because it compares participants' writing proficiency before and after the intervention, providing a precise measure of any changes attributable to using AI tools. The pretest assessed the participants' initial creative writing skills through a standardized writing task. Following this, the intervention was implemented, where participants engaged with AI tools, specifically ChatGPT and Google Bard, to enhance their creative writing over a specified period. After the intervention, a posttest was conducted using a similar standardized writing task to assess any improvements in the participants' writing abilities. By comparing the pretest and posttest results, the study aims to determine the effectiveness of AI tools in developing creative writing skills. The quasi-experimental design was particularly suitable for this study as it allowed for the practical constraints of working within a real-world educational setting while still providing robust data on the potential benefits of integrating AI into the creative writing curriculum.

a. Participants

The study involved 80 participants, comprising 35 males and 45 females, all third-year undergraduate students pursuing a Bachelor's degree in Literature at a university in northeastern Nigeria. The participants' ages ranged from 20 to 27 years. The group was diverse in terms of ethnic and linguistic backgrounds, representing various regions of Nigeria. All participants were enrolled in a compulsory course, *Application of Computer to Arts*, which focused on integrating computer skills with literary studies.

The course covered topics such as creative writing, text analysis, and digital humanities, providing students with practical knowledge of how to use computer tools to enhance their literary work. The participants had varying levels of computer proficiency. However, this is their first engagement with AI tools in creative writing.

b. Research Procedures

Before the data collection for the study, the researchers, who are also the course lecturers, asked for permission from the Department to use the Application of Computer to Arts class for the research. Thereafter, they explained the aim of the research to the participants. The data for the study were collected within 12 weeks. In week one introduction and pre-treatment activities were administered. The participants were asked to write a story of about 500 to 750 words on any topic of their choice. Thereafter, in weeks 2 and 3 they were taught how to use an AI tool to improve their stories or create new ones. The procedures were conducted in two phases.

1. Phase One: Participants were initially asked to compose a story ranging from 500 to 750 words on a topic of their choice. The themes of these stories varied widely, including love, loneliness, agony, and more. Once the stories were written, participants were directed to copy and paste their stories into one of two AI tools, either ChatGPT or Google Bard. They were guided to provide specific prompts to the AI tools, asking them to edit, correct, or revise the stories. After the AI had made its revisions, participants compared the edited versions with their original drafts. They closely analyzed the revised versions, focusing on sentence structure, word choice, and stylistic elements. Participants then made further modifications to the AI-edited stories to align with their personal writing preferences and to ensure the work remained original, thereby avoiding plagiarism. This process was repeated for two weeks, during which participants alternated between using ChatGPT and Google Bard.

2. Phase Two: In the second phase, participants were tasked with giving the AI tools prompts to generate entirely new stories. Each participant was granted complete freedom to customize their prompts according to their preferences,

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allowing them to influence various aspects of the story, including characters, themes, settings, plots, and dialogues. To ensure the uniqueness of their stories, participants were encouraged to use specific and detailed prompts. For instance, they might provide names for characters, specify geographical locations, define time periods, or outline thematic elements or plot sequences. As an example, one participant might ask the AI to create a story about a ten-year-old orphan named Audu living in a village in northern Nigeria during the harmattan season. Once the initial story was generated, participants could continue refining the story by providing additional prompts, offering more details about the characters, setting, theme, plot, or dialogue until they were fully satisfied with the story's content.

In week 12 they were asked to write another story similar to the one written in the pre-test, about 500 to 750 words on any topic.

c. Data Analysis

To answer the research question of the study, which is to determine the impact of Artificial Intelligence tools on participants' creative writing skills, assessment rubrics developed by Mozaffari (2013) were used to grade the participants before and after the intervention writing scripts. The rubrics contain four elements:

1. The image: The ability of a writer to create an image in writing using significant details devoid of abstraction, generalization and judgment

2. Voice: The writer's ability to use images to make his/her voice appealing, that is his/her diction

3. Characterization: The writer's ability to create a character giving details of the character's physical appearance, action, thought, symbol, etc. to reveal characters (complete indirect characterization)

4. Story: The writer's use of narrative to convey purpose, that is his ability to allow the reader to draw his/her conclusion about the purpose of the text.

The rubrics are ranked in four levels which include: excellent, good, fair and poor as explained below:

i. Excellent: Writing in this category demonstrates excellent use of the criterion.

ii.   Good: For writings which fall in this level the criterion is partially achieved.

iii.   Fair: In this category, the criterion is minimally achieved.

iv.   Poor: Writing in this category does not meet the criterion in any respect.

The mean scores of the pre-and-post-treatment stories written by the participants were compared using a paired-sample t-test to determine the impact of the Artificial Intelligence tools on the creative writing skills of the participants. The paired-sample t-test was considered appropriate for the study because it is designed to analyze the same group of participants under two different conditions—pre-intervention and post-intervention. The test allows for assessing whether there is a statistically significant difference in the participants' creative writing abilities after using AI tools like ChatGPT and Google Bard. Given the within-subjects design, where each participant serves as their control, the paired-sample t-test is well-suited to detect any changes in writing proficiency attributable to the intervention.

The reliability and validity of the assessment rubrics were established in many ways. The re Reliability was ensured through a thorough rubric development and testing process through a pilot study. Inter-rater reliability was also confirmed. Two evaluators using the rubrics consistently arrived at similar scores for the same writing samples. Furthermore, the validity was addressed by ensuring that the rubrics accurately measured the intended aspects of creative writing. A panel of experts checked the Content validity, which was achieved by aligning the rubric criteria with established literary theory and writing standards. Construct validity was also considered, ensuring that the rubrics accurately reflected the constructs of imagery, voice, characterization, and narrative purpose.

Results

The descriptive statistical analysis was conducted on the writing scores before and after treatment. The mean total score for pre-treatment writing was (M = 64.03), which saw an increase to (M = 79.81) post-treatment. Similarly, the mean score for the image in pre-treatment was (M = 17.78) and rose to (M = 22.33) post-treatment. Additionally, the mean score for voice in pre-treatment was (M = 14.25), showing a

higher value in the post-treatment (M = 18.97). Moreover, the mean score for Characterisation before treatment was (M = 16.31), which increased to (M = 19.60) post-treatment. Lastly, the mean score for Story pre-treatment was (M = 15.69), and it increased in the post-treatment to (M = 18.91).

The outcomes of the paired-sample t-test revealed a significant enhancement in the participants' overall writing scores following the utilization of AI tools (t = 9.09, p = .000). Furthermore, there were notable differences in all writing components of the participants before and after treatment: image (t = 11.88, p = .000); voice (t = 8.73, p = .000); Characterisation (t = 3.31, p = .000), and Story (t = 4.38, p = .000). The results of the paired-sample t-test are presented in Table 1.

Table 1: Result of the participants' pre-and post-treatment writing scores (n = 80)

Components	Pre-tr. Mean	Post-tr. Mean	Mean diff.	SD	t value	Sig. (2 tailed)
Image	17.78	22.33	4.58	0.95	11.88	.000
Voice	14.25	18.97	4.75	0.97	8.73	.000
Characterization	16.31	19.60	3.29	1.78	3.31	.000
Story	15.69	18.91	3.22	1.95	4.38	.000
Overall	64.03	79.81	15.78	4.15	9.09	.000

p value = .05

The significant increase in the mean total writing score from M=64.03M pre-treatment to M=79.81 post-treatment indicates that the AI tools effectively enhanced overall writing proficiency. Each component of writing—image, Voice, Characterization, and Story—also showed notable improvements.

The substantial increase in the mean score from M=17.78M to M=22.33M = 22.33 suggests that AI tools significantly improved participants' ability to create vivid and detailed imagery in their writing. This enhancement is crucial for engaging readers and conveying meaningful visual impressions. The rise from M=14.25M to M=18.97M highlights that participants were better able to develop a distinctive and appealing voice in their writing, enhancing their overall diction and stylistic expression. The improvement from M=16.31M to M=19.60M indicates that AI tools helped participants

create more nuanced and detailed characters, which is essential for deep, engaging narratives. The increase from M=15.69M to M=18.91M reflects enhanced narrative effectiveness, with participants being better able to convey purpose and allow readers to draw meaningful conclusions from their stories. The significant results across all components underscore the AI tools' effectiveness in developing various aspects of creative writing. This finding emphasizes the potential of AI technologies to serve as valuable resources in educational settings, fostering improved writing skills and deeper engagement in creative processes.

Discussion

The findings of the current study align closely with several key studies exploring the impact of AI tools on creative writing. Susanto, Woo, and Guo (2023) investigated the roles of language models in enhancing student creativity, noting that AI tools can act as collaborators or provocateurs. The current study supports this by demonstrating that ChatGPT and Google Bard significantly improved participants' creative writing abilities. The AI tools' capacity to generate and refine content provided students with valuable feedback and inspiration, reinforcing their role as effective collaborators in the writing process. Similarly, Pratama and Hastuti (2024) evaluated the effectiveness of AI in teaching writing to high school students and found that AI positively impacted students' writing skills. This study's findings are consistent with those of the current research, which showed a substantial improvement in writing scores after using AI tools. The significant enhancements in areas such as image creation, voice, characterization, and storytelling underscore the positive influence of AI on writing skills, as also observed by Pratama and Hastuti.

The study by Kress et al. (2019) further supports these findings, as it observed that students using digital tools for creative writing engaged more profoundly and produced higher-quality work than those who did not use such tools. This is consistent with the current study's results, which indicate that AI tools facilitated better writing practices and led to higher-quality outcomes. The improvement in participants' writing

scores and their increased engagement with the writing process echo the observations made by Kress et al.

Li et al. (2020) found that students who received feedback from AI writing assistants revised their work more effectively and made more significant improvements than those who did not receive such feedback. This finding is mirrored in the current study, where participants who utilized AI tools significantly improved their writing skills. The feedback and suggestions provided by the AI tools were crucial in helping students refine their work and achieve better results. Additionally, Afdaliah, Uswatunnisa, and Marliana (2019) reported that Google Docs significantly improved Indonesian students' writing skills and increased their interest in using technology for writing development. This study's findings align with the current research, which also demonstrated that AI tools improved writing proficiency and enhanced participants' interest in leveraging technology for creative writing.

Finally, the research by Bateman et al. (2022) observed that students using AI-powered tools to generate creative text formats exhibited higher levels of creativity. The current study supports this observation, as using AI tools led to notable improvements in participants' creative writing abilities, reflecting a boost in creativity and originality in their writing. In summary, the current study's results are consistent with prior research, highlighting that AI tools like ChatGPT and Google Bard effectively enhance creative writing skills. The improvements observed in various writing components reinforce the findings of earlier studies, emphasizing the value of AI tools as educational resources for fostering better writing practices and greater creativity among students.

Conclusion

This research examines the impact of artificial intelligence tools ChatGPT and Google Bard on the creative writing of undergraduate students in Nigeria. The mean total writing score increased from M=64.03M before the intervention to M=79.81M = 79.81 afterwards, demonstrating a significant improvement in overall writing proficiency. Furthermore, the outcomes reveal a substantial amelioration across all

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components of creative writing, encompassing imagery, narrative voice, character portrayal, and storytelling. However, the study's limited participant pool and brief treatment duration could impact the generalizability and robustness of the findings. A small sample size may not adequately represent the broader student population, potentially affecting the reliability of the results. Moreover, the short duration of the intervention might not fully capture the long-term effects of AI tools on creative writing skills. These limitations could introduce biases and may not account for the sustained impact of AI tools over a more extended period. To address these constraints, future research should involve larger and more diverse samples and extend the treatment duration to provide a more comprehensive understanding of AI tools' effectiveness.

Future research could benefit from investigating various AI tools and their specific features to identify the most beneficial aspects of creative writing. Additionally, longitudinal studies could assess the long-term impact of AI tools on writing skills and creativity. Exploring different educational contexts and diverse student populations could offer broader insights and help validate the generalizability of the findings.

Integrating AI tools into creative writing curricula can provide significant benefits for educators. Educators might incorporate these tools into drafting and revision processes, use them in brainstorming sessions, and design AI-enhanced writing workshops to demonstrate effective usage. Creating AI-assisted peer review systems could also facilitate improved feedback and learning. For learners, utilizing AI tools for drafting, revision, and exploring various writing styles can enhance their creative writing skills. Students should actively seek and reflect on AI-generated feedback to improve their work. By employing these strategies, educators and learners can maximize the benefits of AI tools and foster greater creativity in writing practices.

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