

Influence of Generative Artificial Intelligence on Students' Academic Activities among Undergraduates in Ramat Polytechnic, Maiduguri

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Abstract

This study examined the influence of artificial intelligence on students' academic activities using a descriptive survey design. The population consisted of 1,847 Higher National Diploma (HND) students, from which a sample of 319 respondents was determined using the Raosoft sample size calculator at a 95% confidence level and 5% margin of error. Data were collected through a structured questionnaire comprising four sections: demographic information, types of academic activities involving generative AI, types of AI tools used, and frequency of AI usage in academic contexts. The instrument included both dichotomous (yes/no) and Likert-scale items. Data were analyzed using descriptive statistics and simple linear regression with SPSS (version 27).

The findings revealed that students predominantly utilized generative AI for activities such as editing, paraphrasing, and grammar checking 260(87.5%), drafting essays and assignments (252; 84.8%), summarizing lecture notes and course materials 241(81.1%), and generating research topics and project ideas 218(73.4%). Commonly used AI tools included ChatGPT, QuillBot, Canva, and Notion AI. The overall frequency of AI use was moderate, with a weighted mean of 2.45. Furthermore, the results indicated a significant positive relationship between the types of generative AI tools used and students' academic activities at Ramat Polytechnic, Maiduguri. The study recommends the integration of generative AI into broader academic practices, alongside increased awareness and practical training to enhance effective utilization.

Keywords: Generative Artificial Intelligence; Students; Academic Activities; Undergraduates; Ramat Polytechnic

Background

Students' academic activities form the cornerstone of learning and intellectual development in higher education. These activities include attending lectures, participating in discussions, completing assignments, conducting research, and collaborating with peers and instructors (Kapur, 2024). These activities enable students to assimilate theoretical knowledge and build essential cognitive skills, including critical thinking, problem-solving, and logical reasoning. Research indicates that regular participation fosters self-discipline, perseverance, and cognitive interaction, which are crucial elements for academic success and lifelong learning (Schneider & Brickell, 2017; Weiland, 2024). Furthermore, these activities support students' holistic development by

promoting self-regulation, creativity, collaboration, and time management skills necessary to navigate complex educational and professional environments (Contrino et al., 2024; Calonia et al., 2023). Specifically in Nigeria, where academic performance is a critical issue, active participation in academic activities is crucial for maintaining motivation to learn and enhancing educational outcomes (Okoedion et al., 2019).

In recent times, the emergence of artificial intelligence, particularly generative AI, has begun to fundamentally transform how students engage in their academic activities (Frank et al., 2025; Vieriu & Petrea, 2025). Artificial intelligence refers to computer systems capable of performing tasks that typically require human intelligence, such as reasoning, language processing, and problem-solving (Collins et al., 2021). Generative AI tools, such as ChatGPT, DALL-E, Bard, and Claude, can generate original content, including text, images, and analytical output, supporting academic tasks such as idea generation, research assistance, summarization, and writing development (Chan & Hu, 2023; Campillo-Ferrer, López-García, & Miralles- Sánchez, 2025). Studies indicate that integrating generative AI into learning environments enhances student engagement, competence, and creativity by providing immediate feedback, personalized learning support, and opportunities for self-discovery (Guo et al., 2025; Torres, 2025). In Nigeria and other developing education systems, the increasing use of artificial intelligence (AI) technologies is gradually reshaping teaching and learning practices, creating new opportunities for the development of digital literacy and academic innovation (Adigwe, Onafabfa, & Sanyolo, 2024; Ogunbodede & Achrim, 2025). Consequently, understanding how generative AI impacts students' academic activities is becoming increasingly important for aligning technological advancements with effective pedagogical practices in contemporary higher education.

Ramat Technical College, established in 1973 in Maiduguri, Borno State, Nigeria, is a government institution that offers technical and vocational education. Upgraded from a technical college and named after General Murtala Ramat Mohammed, it focuses on fields like engineering, environmental studies, management science, and applied sciences (Ramat Polytechnic, 2021). The college provides National Diploma (ND) and Higher National Diploma (HND) programmes aimed at equipping students with essential skills for employment and entrepreneurship. It has significantly contributed to human capital development in Northeast Nigeria, despite facing infrastructure and security challenges.

Statement of the Problems

Undergraduate students are expected to participate in a variety of academic activities, including attending lectures and completing assignments, to develop critical thinking and problem-solving skills. These activities contribute significantly to their academic success and personal growth by fostering self-discipline and intellectual curiosity. The advent of technological innovations, especially Generative Artificial Intelligence (GenAI), was predicted to enhance these academic activities by offering personalized learning support and simplifying complex tasks. However, there are rising concerns about the implications of GenAI in higher education, as many students overly depend on these technologies for essay writing and problem-solving, potentially diminishing deep learning and cognitive engagement. Observations from Ramat Polytechnic, Borno State, indicate that students rely excessively on generative AI for completing assignments and research, which may hinder their independent learning and creativity. It was further observed that most student use these GenAI tools with deep knowledge of their potentials as successful use of GenAI is preceded

by efficient use of human intelligent as Ai outputs are prone to errors. This study aims to explore how GenAI impacts undergraduates' engagement in academic activities, seeking to understand its role in shaping their educational practices.

Objectives of the Study

The objectives of the study are to:

1. Identify the types of academic activities for which generative artificial intelligence is used among students in Ramat Polytechnic.
2. Identify the types of generative artificial intelligence used among students in Ramat Polytechnic.
3. Examine the frequency of use of generative artificial intelligence among students in Ramat Polytechnic
4. Examine is the relationship between use of generative artificial intelligence and academic activities of students in Ramat Polytechnic.

Research Questions

1. What are the types of academic activities for which generative artificial intelligence is used among students in Ramat Polytechnic?
2. What are the types of generative artificial intelligence used among students in Ramat Polytechnic?
3. What are the frequency of use of generative artificial intelligence among students in Ramat Polytechnic?

Hypothesis

HO1: There is no significant relationship between types of GenAI used and types of academic activities of students in Ramat Polytechnic, Maiduguri

Types of Academic Activities for which Generative Artificial Intelligence is used among Students

Empirical studies reveal that students employ generative artificial intelligence (GenAI) in diverse academic activities, including writing, research, conceptual learning, programming, and collaborative projects. For example, Tabaishat and Elvadel (2025) found that undergraduate students primarily used GenAI tools for essay drafting, paraphrasing, and summarizing academic texts, which improved writing productivity and reduced anxiety. Similarly, Yeung, Tian, Xiu, and Choi (2025) reported that students used AI tools to generate research topics, summarize literature, and develop structured arguments, enhancing research efficiency and comprehension of complex material. Furthermore, Chan and Hu (2023) observed that students frequently used GenAI to clarify difficult concepts and obtain explanations of theoretical content, highlighting AI as a cognitive support tool that promotes self-directed learning.

Further evidence suggests that general AI also supports technical, creative, and collaborative academic tasks. Keuning et al. (2024) reported that computer science students used AI tools such as ChatGPT and GitHub Copilot to generate code, debug code, and understand programming logic, thereby improving their learning and experimentation skills. Similarly, Guo, Zhang, Shi, and Coates (2025) found that students used general AI to create personalized study schedules, develop quizzes, and create innovative project ideas, enhancing their learning engagement and self-efficacy. In collaborative contexts, Rudra et al. (2025) revealed that students used AI platforms to co-create reports, share ideas, and coordinate group tasks, while Deckerlegand et al. (2025) demonstrated that general AI tools supported the creation of multimedia learning materials such as posters, infographics, and simulation content. Overall, these studies show that general AI facilitates a wide range of academic activities, from writing and research to creative production and collaborative learning.

Types of Generative Artificial Intelligence Used among Students

Research indicates that students utilize a wide range of generative AI tools, depending on the academic task at hand. Interactive AI tools are among the most frequently used. Tbaishat and Elvadel (2025) identified ChatGPT as the most commonly used AI platform for brainstorming, summarizing essays, and generating explanations of complex concepts. Similarly, Campillo-Ferrere, López-García, and Miralles-Sánchez (2025) reported that content generation tools, such as Jasper AI and Copy.ai, are widely used by students for essay writing, outlining, and refining academic arguments. These tools have fundamentally transformed outmoded writing practices to enable faster and more structured content development.

Students also extensively rely on language enhancement tools and technical AI to improve their academic performance. Golding et al. (2024) found that GrammarlyGO, QuillBot, and Wordtune are commonly used to improve grammar, style, and coherence in academic writing. In the field of computing, Keuning et al. (2024) noted the widespread use of AI programming assistants, such as GitHub Copilot and CodeWhisperer, for code generation and debugging tasks. Furthermore, creative and research-oriented AI tools are gaining increasing importance. Deckerlegand et al. (2025) identified visual AI tools, such as DALL-E and Midjourney, as valuable resources for creating academic illustrations and multimedia learning materials, while Young et al. (2025) highlighted the use of search-based AI platforms, such as Perplexity AI and Elicit, for literature review and reference identification. Similarly, Rudra et al. (2025) and Torres (2025) pointed to the use of multimedia presentation tools and AI reference management systems to improve academic communication and documentation accuracy. These findings demonstrate that students are utilizing diverse AI technologies to support writing, research, programming, creativity, and academic presentation tasks.

Frequency of Use of Generative Artificial Intelligence among Students

Studies consistently reveal the widespread use of generative AI among university students across various countries and disciplines. Tbaishat and Elfadel (2025) reported that over 78% of undergraduate students use generative AI tools daily for academic tasks, such as essay writing and problem-solving. Similarly, Campillo-Ferrer et al. (2025) found that 61% of Spanish students use AI tools daily, and 24% weekly, for writing and summarizing academic material. In an Asian

context, Yeung et al. (2025) observed that 68% of students at the University of Hong Kong interact with generative AI daily for literature summarization and research assistance. These findings suggest that AI tools are becoming an integral part of students' routine academic practices.

Similar trends have been observed in technical and interdisciplinary learning environments. Keuning et al. (2024) reported that 72% of programming students use AI tools daily for programming and debugging activities. Similarly, Golding et al. (2024) reported that 64% of undergraduate students in the United States use AI-powered writing tools daily to enhance academic communication. In collaborative learning and multimedia contexts, Kudra et al. (2025) observed that approximately 73% of students use generative AI daily for writing, translation, and presentation design, while Torres (2025) found that 66% of students in Manila rely on AI tools daily for research and documentation tasks. Taken together, these studies suggest that the use of generative AI has shifted from occasional to regular academic reliance among undergraduate students.

Relationship between Use of Generative Artificial Intelligence and Academic Activities of Students

There is a strong positive relationship between the use of generative AI and students' academic engagement and performance. Guo, Zhang, Shi, and Coates (2025) reported a strong positive correlation ($r = 0.74$) between the use of generative AI and engagement in learning, particularly in study planning, note-taking, and assignment preparation. Similarly, Golding et al. (2024) found that AI-powered writing tools significantly improved academic performance indicators, such as assignment quality and clarity ($r = 0.68$, $p < 0.01$). These findings suggest that generative AI enhances learning productivity by providing personalized academic support and improving students' writing and research proficiency.

Other studies also confirm that AI-assisted learning improves academic efficiency and collaborative engagement. Yeung et al. (2025) reported that students who used AI tools completed academic tasks up to 60% faster than non-users while also demonstrating a better understanding of research materials. Similarly, Torres (2025) identified a strong correlation ($r = 0.69$) between AI use and research productivity among university students. In technical and collaborative learning environments, Keuning et al. (2024) found a strong correlation ($r = 0.76$) between AI use and participation in project-based programming activities, while Rudra et al. (2025) reported that AI-enabled students demonstrated greater engagement in group academic tasks. Likewise, Dekerlegand et al. (2025) observed that AI-supported creative projects enhanced cognitive creativity and conceptual understanding. Overall, these findings suggest that the responsible and structured use of generative AI positively impacts students' academic activities by improving engagement, productivity, and learning outcomes.

Methodology

This study employs a quantitative descriptive design to investigate the impact of generative artificial intelligence (GenAI) on the academic activities of undergraduate students at Ramat College, Maiduguri. The descriptive survey design is widely used in educational and behavioral research to systematically collect data from a defined population, aiming to describe existing patterns, perceptions, and behaviors without experimental intervention (Cresswell & Creswell, 2018). This design is well-suited to the current study because it allows for the collection of empirical evidence regarding students' interaction with generative AI tools and the extent to which these technologies support their academic activities.

The study population consists of 1,847 Higher National Diploma (HND) students enrolled at Ramat College, Maiduguri, Borno State. A sample size of 319 respondents was determined using the Roasoft Sample Size Calculator at a 95% confidence level, a 5% margin of error, and a 50% response distribution standards commonly used to ensure statistical representativeness in survey-based research (Roasoft, 2025). Participants were selected using convenience sampling, a non-probability method that allows researchers to access available and willing respondents during the data collection period.

Data was collected using a structured questionnaire which consists of four sections. The first section collects demographic information, such as gender, age, department, and academic level. The second section measures the types of academic activities in which students use generative AI tools measured in yes/no. The third section assesses the types of generative AI tools students use, also using seven dichotomous items, reflecting different AI platforms and applications. The fourth section examines the prevalence of general AI use in academic contexts, using seven items measured on a four-point Likert scale ranging from always to rarely. Data analysis was conducted using descriptive and inferential statistical methods with SPSS version 27. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the demographic characteristics of respondents and their patterns of AI use in various academic activities. Simple linear regression analysis was used to test the study hypothesis with SPSS version 27 at a significance level of 0.05. The results are presented in tabular form.

Data analysis

Demographic information

Table 1: Demographic Information of Respondents

Variable	Categories	Frequency (f)	Percentage (%)
1. Gender	Male	174	58.6
	Female	123	41.4
2. Age	Below 20 years	62	20.9
	21–25 years	148	49.8
	26–30 years	61	20.5
	31 years and above	26	8.8

3. Level of Study	HND I	171	57.6
	HND II	126	42.4
Total		297	100

The analysis from table 1 shows the demographic information of the respondents. The data indicate that male students formed the majority of the sample. This finding suggests that male students are more represented in the population of Ramat Polytechnic Maiduguri than female students. It could also reflect a higher male enrollment rate in technology and science-based disciplines where generative artificial intelligence is commonly used. This distribution shows that perspectives from both genders were adequately represented, allowing balanced insights into the influence of generative AI on academic activities among undergraduates.

The data show that the majority of respondents (49.8%) fall within the 21–25 years age bracket, representing the typical age range of undergraduates in polytechnic institutions. This suggests that the study’s respondents are mainly youthful and active learners who are likely to be more adaptive to technological innovations such as generative artificial intelligence tools. The smaller percentage of respondents aged above 30 years may indicate fewer mature or part-time students, highlighting that the adoption and use of GenAI are primarily driven by younger, digitally aware learners. The result shows that most respondents were HND I students. This suggests that more students in their first year of higher national diploma participated in the study, possibly due to greater accessibility and availability during data collection. The distribution also implies that awareness and use of generative AI tools are not restricted to senior students alone but are becoming common across different levels of study. The balanced representation between HND I and HND II students enhances the generalizability of the findings on how generative AI influences academic activities in Ramat Polytechnic Maiduguri

Academic Activities for Which Generative Artificial Intelligence is used among Students
Table 4.2: Types of Academic Activities for Which Generative Artificial Intelligence is Used among Students

S/N	Statement	Agree	Disagree	Mean	SD
1	Drafting essays and assignments with generative AI tools	252 (84.8%)	45 (15.2%)	3.52	0.61
2	Summarization of lecture notes and course materials with generative AI tools	241 (81.1%)	56 (18.9%)	3.44	0.64
3	Generating research topics and project ideas with generative AI tools	218 (73.4%)	79 (26.6%)	3.29	0.71

4	Editing, paraphrasing, and checking grammatical errors in my work with generative AI tools	260 (87.5%)	37 (12.5%)	3.61	0.58
5	Data analysis or report writing with generative AI tools	204 (68.7%)	93 (31.3%)	3.18	0.77
6	Presentation preparation and visual content creation with generative AI tools	227 (76.4%)	70 (23.6%)	3.35	0.68
7	Simulating of quiz and examinations questions with generative AI tools	211 (71.0%)	86 (29.0%)	3.23	0.73
Weighted Mean				3.37	

The findings indicate widespread use of generative AI tools across students' academic activities, with particularly strong reliance on writing-related tasks. A majority of respondents use AI for essay drafting (84.8%; $M = 3.52$, $SD = 0.61$), reflecting its central role in structuring ideas and reducing writing stress. The highest usage was recorded in editing, paraphrasing, and grammar checking (87.5%; $M = 3.61$, $SD = 0.58$), suggesting that language refinement is the most dominant application of AI in academic work. Students also extensively use AI for summarizing lecture materials (81.1%; $M = 3.44$, $SD = 0.64$), indicating its importance in enhancing comprehension and saving time. A substantial proportion employ AI for generating research topics and ideas (73.4%; $M = 3.29$, $SD = 0.71$), highlighting its value as a creative and brainstorming tool, although usage is slightly less widespread. Similarly, AI is used for presentation preparation (76.4%; $M = 3.35$, $SD = 0.68$), supporting the creation of visually appealing academic content. Moderate usage was observed in data analysis and report writing (68.7%; $M = 3.18$, $SD = 0.77$), suggesting that while AI is recognized in analytical tasks, it is less commonly applied compared to writing functions. Additionally, 71.0% ($M = 3.23$, $SD = 0.73$) use AI for self-assessment through quiz and exam simulation, indicating its emerging role in personalized learning and revision.

Overall, the weighted mean of 3.37 shows that generative AI is broadly integrated into students' academic activities with the greatest emphasis on writing, editing, summarization, and creative support, positioning AI as a critical tool for enhancing academic productivity and learning efficiency.

What are the Types of Generative Artificial Intelligence Used among Students?

Table 4.3: Types of Generative Artificial Intelligence Used among Students

S/N	Statement	Yes	No	Mean	SD
1	ChatGPT	267 (89.9%)	30 (10.1%)	3.58	0.63
2	QuillBot	254 (85.5%)	43 (14.5%)	3.49	0.67

3	Google Bard (Gemini)	122 (41.1%)	175 (58.9%)	2.41	0.79
4	Canva AI	136 (45.8%)	161 (54.2%)	2.49	0.76
5	Mendeley	118 (39.7%)	179 (60.3%)	2.38	0.81
6	Claude AI	207 (69.7%)	90 (30.3%)	3.18	0.74
7	Notion AI	129 (43.4%)	168 (56.6%)	2.45	0.78
Weighted Mean				2.85	

The findings reveal varying levels of importance attached to different generative AI tools, with a strong preference for text-based applications. ChatGPT was rated the most important tool (89.9%; $M = 3.58$, $SD = 0.63$), indicating widespread reliance for writing, idea generation, and academic support. Similarly, QuillBot recorded high importance (85.5%; $M = 3.49$, $SD = 0.67$), highlighting its role in improving writing quality, grammar, and originality. In contrast, Google Bard (Gemini) showed low adoption (41.1%; $M = 2.41$, $SD = 0.79$), suggesting limited perceived usefulness for research activities. Canva AI also had moderate but not widespread use (45.8%; $M = 2.49$, $SD = 0.76$), indicating that AI-driven design is not yet central to students' academic work. Similarly, Mendeley was underutilized (39.7%; $M = 2.38$, $SD = 0.81$), reflecting low engagement with AI-supported citation practices and a need for improved digital literacy. Claude AI showed relatively higher importance among technical students (69.7%; $M = 3.18$, $SD = 0.74$), emphasizing its role in programming and problem-solving tasks, though its use is more discipline-specific. Meanwhile, Notion AI recorded low importance (43.4%; $M = 2.45$, $SD = 0.78$), indicating limited adoption for academic organization and productivity.

Overall, the weighted mean of 2.85 suggests a moderate perception of AI tools' importance, with clear dominance of writing and editing applications such as ChatGPT and QuillBot. Other tools related to research, design, referencing, and productivity remain underutilized, highlighting the need for increased awareness and training to expand students' effective use of diverse AI applications in academic contexts.

What is the Frequency of Use of Generative Artificial Intelligence among Students?

Table4.4: Frequency of Use of Generative Artificial Intelligence among Students

S/No	Statement	Often	Always	Sometimes	Rarely	Mean	SD
1	I use ChatGPT for writing support.	124 (41.8%)	103 (34.7%)	53 (17.8%)	17 (5.7%)	1.88	0.82

2	I use QuillBot for grammar checking and paraphrasing.	111 (37.4%)	89 (30.0%)	67 (22.6%)	30 (10.1%)	2.06	0.89
3	I use Google Bard (Gemini) for research assistance.	63 (21.2%)	49 (16.5%)	103 (34.7%)	82 (27.6%)	2.69	0.96
4	I use Canva AI for designs of assignments.	56 (18.9%)	43 (14.5%)	117 (39.4%)	81 (27.3%)	2.75	0.94
5	I use Mendeley for generating and managing references.	51 (17.2%)	39 (13.1%)	104 (35.0%)	103 (34.7%)	2.87	0.97
6	I use Claude for coding-related academic work.	82 (27.6%)	68 (22.9%)	94 (31.6%)	53 (17.8%)	2.39	0.93
7	I use GenAI such as Notion AI and Jasper AI for organizing academic notes.	73 (24.6%)	61 (20.5%)	96 (32.3%)	67 (22.6%)	2.53	0.91
Weighted Mean						2.45	

The results indicate that a large proportion of students use ChatGPT frequently for writing support, with 41.8% of respondents stating they often use it, 34.7% reporting they always use it, 17.8% sometimes, and only 5.7% rarely. This gives a mean score of 1.88 and a standard deviation of 0.82, indicating a high level of frequency of ChatGPT use. The finding suggests that ChatGPT is the most frequently used generative AI tool among students for writing-related academic activities. Its conversational nature and capacity to generate detailed explanations make it an indispensable writing assistant, helping students draft essays, edit content, and seek clarification on complex topics. For QuillBot, 37.4% of respondents often use it, 30.0% always use it, 22.6% sometimes use it, and 10.1% rarely use it. The mean score of 2.06 and standard deviation of 0.89 show a high but slightly lower frequency compared to ChatGPT. This result indicates that QuillBot is widely used but mainly as a supplementary tool for grammar correction and paraphrasing rather than as a primary academic assistant. The frequency pattern implies that students rely on it occasionally after producing content with ChatGPT or during editing and proofreading stages of their academic writing.

The use of Google Bard (Gemini) for research assistance appears moderate, with 21.2% of respondents using it often, 16.5% always, 34.7% sometimes, and 27.6% rarely. The mean score of 2.69 and standard deviation of 0.96 indicate occasional use. This suggests that while some students explore Bard for academic information, most still prefer ChatGPT, possibly because Bard's interface and accessibility may be limited. The result shows that although Bard is recognized as a generative AI tool, it has not yet gained the same trust and familiarity as ChatGPT among students in Ramat Polytechnic. Findings show that Canva AI is used less frequently, with 18.9% often, 14.5% always, 39.4% sometimes, and 27.3% rarely using it. The mean score of 2.75 and standard deviation of 0.94 reveal that Canva AI use is occasional. The result suggests that while some students use Canva AI for designing slides, posters, and visual projects, it is not a core academic tool for most. Many students may still prefer traditional PowerPoint or manual design methods. However, the data reflect growing awareness of creative AI applications for academic assignments that involve multimedia production.

Regarding Mendeley, only 17.2% of respondents reported using it often, 13.1% always, 35.0% sometimes, and 34.7% rarely. The mean of 2.87 and standard deviation of 0.97 show a low frequency of use. This finding suggests that most students are not yet fully utilizing reference management tools for academic work. Many may lack digital literacy in citation management or may rely on manual referencing. The relatively low mean highlights the need for library orientation and training programs on effective use of AI-powered citation and research organization tools like Mendeley. For Claude AI, 27.6% often use it, 22.9% always use it, 31.6% sometimes use it, and 17.8% rarely use it. The mean score of 2.39 and standard deviation of 0.93 indicate a moderate level of use. This suggests that Claude AI is mainly utilized by students in technical disciplines such as computer science or engineering, where AI is applied in problem-solving and programming. The finding implies that while Claude AI has limited appeal to non-technical students, it serves as an important coding assistant for those in computational fields, improving their learning outcomes in technical subjects.

The frequency of use of Notion AI and Jasper AI for organizing academic notes shows that 24.6% often use them, 20.5% always use them, 32.3% sometimes use them, and 22.6% rarely use them. The mean of 2.53 and standard deviation of 0.91 suggest occasional use. The data imply that note-organization and productivity-based AI tools are moderately used, possibly due to limited awareness or preference for conventional note-taking methods. The result highlights that while such tools can enhance academic organization, their adoption remains low compared to text-generation and grammar-checking tools. The weighted mean of 2.45 indicates that students use generative artificial intelligence tools moderately often in their academic activities. The highest frequency of use was recorded for ChatGPT and QuillBot, confirming that writing-related applications dominate AI use among undergraduates. Tools such as Mendeley, Canva AI, Bard, and Notion AI are used less frequently, suggesting that awareness and technical familiarity play major roles in determining the frequency of AI adoption. The findings imply that while generative AI tools are integrated into students' learning routines, their use remains focused on a few key applications, highlighting a need for institutional initiatives to expand students' exposure to the broader spectrum of AI-assisted academic technologies.

Hypothesis Testing

Table 4.5: Hypothesis Testing

Hypothesis	<i>R</i>	<i>R</i> ²	β	<i>t-value</i>	<i>p-value</i>	Decision
H ₀₁ : There is no significant relationship between types of GenAI used and types of academic activities of students in Ramat Polytechnic.	0.682	0.465	0.682	10.909	0.000	Rejected

The regression result presented in Table 4.8 reveals that the relationship between the type of generative artificial intelligence used and types of academic activities of students is statistically significant at $p < 0.05$. The correlation coefficient ($R = 0.682$) indicates that for every one unit of use, irrespective of the type, generative AI improves academic activities by 68%, revealing a strong positive association, while the coefficient of determination ($R^2 = 0.465$) indicates that about 46.5% of the variation in academic activities can be attributed to the types of generative AI used. The calculated *t*-value (10.909), being greater than the critical value of 1.96, further supports this significance. Consequently, the null hypothesis was rejected, confirming that types of GenAI used has a significant and positive relationship with the types of academic activities of students in Ramat Polytechnic, Maiduguri.

Summary of Findings

1. The findings revealed that students extensively use generative artificial intelligence tools, especially ChatGPT and QuillBot, for essay writing, paraphrasing, summarizing lecture materials, and preparing assignments, indicating strong integration of AI in students' academic tasks.
2. ChatGPT and QuillBot are rated as the most important AI tools among students, while others such as Bard, Canva AI, Mendeley, and Notion AI are less valued, suggesting selective preference for text-based generative AI applications.
3. Students use generative AI tools moderately often, with ChatGPT and QuillBot showing the highest frequency of use for writing and grammar support, signifying regular but focused use of AI in academic activities.
4. The hypothesis revealed a strong positive and statistically significant relationship between the use of generative artificial intelligence and students' academic activities in Ramat Polytechnic, Maiduguri.

Discussion of Findings

The findings of this study align closely with prior literature while offering contextual insights into students' use of generative artificial intelligence (GenAI) in Nigerian polytechnic education. The finding that students extensively use GenAI tools, particularly ChatGPT and QuillBot, for essay writing, paraphrasing, summarizing lecture materials, and preparing assignments corresponds with the results of Tbaishat and Elfadel (2025), who discovered that students at the University of Jordan used AI mainly for writing and paraphrasing tasks to enhance productivity and linguistic accuracy.

Similarly, Torres (2025) reported that students in the University of Manila relied heavily on AI for essay correction and self-assessment, which improved their writing proficiency. These studies, together with the current one, confirm that generative AI has become a core instrument for textual academic activities. However, while Tbaishat and Elfadel (2025) cautioned against overreliance on AI-generated outputs, the current study found an even deeper dependence, suggesting a greater integration of AI into everyday student work at Ramat Polytechnic.

ChatGPT and QuillBot were rated as the most important AI tools among students, whereas Bard, Canva AI, Mendeley, and Notion AI were less valued, indicating a strong preference for text-based GenAI applications. This selective usage pattern aligns with the findings of Golding et al. (2024) at the University of Kentucky, who identified GrammarlyGO, QuillBot, and Wordtune as the most frequently used AI tools among students, primarily for writing enhancement and grammar improvement. Similarly, Campillo-Ferrer, López-García, and Miralles-Sánchez (2025) found that Jasper AI and Copy.ai were preferred for essay drafting and paraphrasing among Spanish students, confirming that students worldwide favor text-based AI applications due to their direct utility in academic writing. Conversely, the current study contrasts with Dekerlegand et al. (2025), who found higher usage of creative AI tools such as DALL·E and Canva among U.S. rehabilitation science students, implying that field of study influences tool preference. Hence, the dominance of text-focused GenAI tools among Ramat Polytechnic students reflects the academic orientation toward writing-centered coursework rather than visual or multimedia production.

Generative AI tools such as ChatGPT and QuillBot show the highest use frequency for writing and grammar support and also support international evidence of habitual AI use in higher education. Tbaishat and Elfadel (2025) observed that over 78% of students in Jordan used AI daily for academic writing and research, while Campillo-Ferrer et al. (2025) found that 61% of Spanish students used AI daily and 24% weekly. Likewise, Yeung et al. (2025) at the University of Hong Kong reported that 68% of respondents used GenAI daily for summarizing and generating academic materials. However, in contrast, the current study recorded only moderate frequency, suggesting that infrastructural or awareness limitations might restrict daily engagement at Ramat Polytechnic. This finding aligns with Golding et al. (2024), who noted that students using AI daily often showed dependency and reduced critical thinking, an issue that may explain why moderate use persists in the Nigerian context as a balance between productivity and originality.

Finally, the hypothesis revealed a strong positive and statistically significant relationship between the use of generative artificial intelligence and students' academic activities in Ramat Polytechnic, Maiduguri. This corroborates the findings of Guo, Zhang, Shi, and Coates (2025), who reported a strong positive correlation ($r = 0.74$) between GenAI use and students' learning engagement among Chinese undergraduates. Similarly, Golding et al. (2024) identified a significant relationship ($r = 0.68$, $p < 0.01$) between AI use and academic performance at the University of Kentucky, while Torres (2025) found a positive correlation ($r = 0.69$) between AI utilization and research productivity in Manila. These studies all affirm that responsible and purposeful integration of GenAI enhances academic efficiency, engagement, and performance. However, consistent with Rudra et al. (2025), the present study emphasizes the need to manage overreliance, as excessive AI use can undermine creativity and independent learning. Overall, this research reinforces global findings that GenAI use, when guided by ethical and pedagogical principles, significantly enriches students' academic experiences and outcomes.

Conclusion

The study examined the influence of generative artificial intelligence on students' academic activities among undergraduates in Ramat Polytechnic, Maiduguri. The findings established that generative AI tools such as ChatGPT and QuillBot have become central to students' learning routines, primarily supporting writing, editing, and paraphrasing tasks. Also, students use AI tools moderately often and place greater importance on text-based applications than on specialized or technical ones. There is a low awareness and limited utilization of other generative AI tools such as Mendeley, Canva AI, Google Bard (Gemini), and Notion AI, indicating that students have not yet fully explored the broader potential of generative AI for academic research, reference management, creativity, and organization. Finally, there is a strong and significant relationship between the use of generative AI and students' academic activities, implying that increased and purposeful use of these technologies enhances learning outcomes and academic performance.

Recommendations

1. Ramat Polytechnic should expand the integration of generative AI into broader academic areas such as data analysis, research simulations, and project development by organizing hands-on workshops that encourage students to explore more diverse AI applications beyond writing and paraphrasing.
2. The institution should promote awareness campaigns and practical training sessions that expose students to underutilized AI tools like Bard, Canva AI, Mendeley, and Notion AI to help them appreciate their relevance in research, referencing, creativity, and academic organization.
3. Lecturers and academic advisors should encourage frequent and purposeful use of generative AI tools across all learning areas by incorporating AI-based assignments and activities into coursework to enhance consistent engagement and skill development among students.
4. The Polytechnic management should institutionalize the inclusion of generative AI technologies into teaching and learning systems by developing AI-supported academic policies that ensure structured, ethical, and sustainable use of such tools in all departments.

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