

The Accessibility, Utilization, and Application of AI-Powered Tools in English Research Writing

DOI: 10.5281/zenodo.15662396

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Abstract

English research writing remains an uninteresting topic for senior high school students due to its laborious task of drafting, writing, and editing. AI-powered tools offer solutions that can help reduce students' workload, thus improving the process. This study aimed to find out the accessibility, utilization, and application of AI-powered tools in improving the process of English research writing. This descriptive quantitative study was conducted on two hundred and forty-three (243) student-respondents from Mabinay National High School. Data were collected through a survey questionnaire. Grammarly, ChatGPT, and QuillBot were the most used tools, and smartphones were the most used gadgets. Students had restricted access to the tools because of their financial restrictions, unstable internet connection, and limited access to high-end devices. Mostly, utilization served for paraphrasing, summarizing, and checking grammar. Occasionally, teachers applied AI tools to the prewriting, writing, and rewriting stages. Teachers' AI regulations were inconsistently enforced. Despite enhancing efficiency and accuracy, these powerful tools pose challenges in accessibility and in observing ethical standards. This study emphasizes the need for institutional support, digital literacy education, and equitable policies to maximize AI-powered tools' benefits while reducing disadvantages.

Keywords: *accessibility, utilization, application, AI-powered tools, English research writing*

Introduction

Writing an English research paper should be enjoyable and entertaining. It allows senior high school students to explore, investigate, and learn more about their preferred topics. However, because of the laborious task of drafting, writing, and editing research papers, they often became unmotivated to finish this scholarly task as time passed. The planning, summarizing, paraphrasing, and checking of its grammar, mechanics, clarity, and coherence brought them stress and pressure (Zhang, 2019).

Paurillo (2019) indicated that 93 percent of senior high school students from Quezon City, Philippines, lacked motivation in research writing. On the other hand, 100 percent of them agreed that different tools and activities should be used to solve these challenges.

Moreover, in a time when technology is becoming increasingly significant, using artificial intelligence (AI)-powered tools for improving the English research paper writing process has become vital (William & Beam, 2019).

Given the abundant materials in the digital age, accessing, utilizing, and applying AI-powered tools to research writing are crucial. Moreover, specific laws such as Republic Act 10533, also known as the Enhanced Basic Education Act of 2013, support the responsible use of modern technology as they aim to equip graduates with information, media, and technology skills. Technology integration in research classes is important as it does not only teach students the research process but also teaches them how to responsibly use technology as an aid to accomplish research-related tasks (Violon & Violon-Agudo, 2024).

This study aimed to find out the accessibility, utilization, and application of AI-powered tools; determine the strategies of teachers in maintaining the integrity of English research writing; and figure out the significant effect of student-respondents' profiles on the extent of accessibility, degree of utilization, and level of application of AI-powered tools. All these were done for the purpose of improving the process of English research writing to help and teach students how to enjoy, love, and treasure the research process and not to discourage or burden them with the workload that comes with it.

Literature Review

This section examines concepts and ideas pertinent to the current study.

Republic Act No. 11927, referred to as the Philippine Digital Workforce Competitiveness Act, recognizes the alterations in employment prospects resulting from the swift expansion of digitalization and technological innovations across diverse sectors, including artificial intelligence and robotics. This legislation seeks to enhance the competencies and competitiveness of the Filipino workforce in relation to both human and digital technologies and innovations. It additionally fosters digital innovations and entrepreneurship (Sigue, 2022).

Conversely, Republic Act No. 10844, referred to as the Department of Information and Communications Technology Act of 2015, aims to recognize the vital importance of information and communication in national development. It also seeks to promote the use of ICT to enhance vital public services, including education, public health and safety, revenue generation, and socio-civic purposes. Advocating for the use of ICT to enhance and promote the nation's arts and culture, tourism, and national identity prepares graduates to thrive in a dynamic landscape of information and communication technology (Abasola, 2023).

Research writing in English involves the composition of a research paper utilizing the English language. A research paper is an academic document that provides comprehensive analyses, evaluations, and interpretations of a specific issue based on empirical evidence. This format resembles an analytical essay, with a focus on statistical data, previous research, and a rigorous citation policy. It lacks a uniform format but consistently adheres to comparable fundamental patterns and components. The document includes an abstract, introduction, theoretical background, problem statement, significance of the study, literature review, research methodology, findings, conclusion, and recommendations (Ellis, 2023).

However, senior high school students find writing an English research paper laborious. Senior high school teachers must employ tools to encourage and motivate students to enjoy and love this specific writing process. Thus, AI-powered tools must be introduced to learners.

Artificial Intelligence (AI) powered tools refer to computer applications, websites, software, programs, or digital resources that enhance writing proficiency by recognizing errors, providing modifications, and rectifying grammatical and spelling issues as one inputs text into a document. These AI-powered tools assist students and professional writers avoid the proofreading phase by automatically revising their material as they write, saving them time and effort that would otherwise be spent on this task later. To utilize these tools, writing on a digital platform is necessary. Specific AI tools necessitate an online connection during the writing process (One Education, 2023).

The tool's main goal is to speed up monotonous tasks that would otherwise demand twice as much time. From that vantage point, these tools show effectiveness by accelerating and easing the overall writing process (One Education, 2023).

Moreover, these modern tools offer several advantages in raising students' writing quality. They aim to provide them more opportunities, simplicity of teamwork, and inspiration for their own ideas. Using these tools for student writing allows one to reach more people and enable others to share their work (Explorance, 2024).

In addition, utilizing digital technologies for student writing facilitates uninhibited self-expression and fosters creativity. One can employ any writing style to convey emotions over a topic effectively.

The following are some of the AI-powered tools used by students in writing English research papers:

A. ChatGPT

ChatGPT helps writers in all spheres of the writing process. It helps them to grasp the essay and other forms of writing compositions by offering thorough and well-researched responses. It also assists them make titles, construct sentences, and arrange paragraphs. It also points up facts and articles fit for an essay or narrative, allowing writers to support their claims with accurate evidence. Writers should be very cautious, nevertheless, since the instrument may produce falsified statistics devoid of any basis (Pfeifer, 2024).

B. Cici

Cici is an AI-powered tool meant to help writers and researchers with different writing tasks, making them more productive and ensuring the quality of their work. Some of the things it can do are paraphrase, create content, check for copying, translate languages, and summarize. When writing research papers, Cici can help one rewrite and paraphrase existing material to stay original and make sense while avoiding plagiarism. Its content generation features let users write parts of research papers based on questions, which helps writers get past writer's block and speeds up the writing process (Ahmed, 2023).

This tool also works with more than 100 languages, which makes it easier to use sources from around the world by translating them. It also has a feature that lets researchers condense long pieces of information, which makes book reviews more efficient. With features that look for plagiarism, Cici protects academic honesty by finding and fixing problems with copying work before it is turned in. This tool is like having an interactive research assistant that helps write well-researched, and well-written academic papers (Ahmed, 2023).

C. Grammarly

Grammarly ensures that your research papers effectively convey your thoughts. It guides how to effectively tackle outlines, abstracts, citations, and all other essential elements for crafting a refined work. Grammarly's writing suggestions ensure the accuracy and integrity of one's work by detecting errors and reminding the writer to credit his/her sources correctly, providing him/her with confidence in the quality of his/her submissions (Pfeifer, 2024).

D. QuillBot

QuillBot will consolidate the varied and often complex information. The user will have an enhanced capacity to comprehend and assimilate the information when it is bulleted. This tool facilitates restating information to enhance understanding and provide an alternative viewpoint on the given information. This tool will generate accurate citations for research purposes, requiring only essential source details. In addition, it collaborates with the writer to compose papers and articles (Pfeifer, 2024).

On the other hand, curriculum for writing should be developed by schools to meet the present needs of their students (Urbano et al., 2021). Considering this, teachers should acquire more information about the advantages and disadvantages of AI. The writing assignments ought to be based on the interests and preferences of the students.

Furthermore, it is clear from examining the students' access to artificial intelligence tools for research writing that those who had the opportunity to use and familiarize themselves with the devices were able to produce their writings with more freedom and creativity. The students underlined the need of consistent practice in properly using devices depending on their preferences. Although students recognized some advantages, they underlined the requirement of practice in order to maximize them (Marzuki et al., 2023).

Unfortunately, technology has badly affected students' writing skills in the classroom even if it has evolved and grown indispensable in modern life (Carstens et al., 2021). Simplifying chores has encouraged a mindset that lessens students' effort in their written assignments, therefore making it more difficult to tell informal from formal writing. Success in both the classroom and in the workstation depends on mastery of research writing including mechanics, logical arrangement and clear communication of ideas. Moreover, depending too much on technology—spell check and automatic writing tools—has reduced learners' grasp of language and sentence structure.

As students rely more on technology for writing, their capacity to express whole ideas and engage in autonomous thought is decreasing. These modern tools inhibit them from learning critical writing techniques, which results in poor research writing. Frequent texting and instant messaging also bring non-standard English into formal writing, substituting contractions and shorthand for sophisticated language (Pham, 2022).

One of the artificial intelligence-powered tools, ChatGPT, can create comments, summarize texts, create fictional and nonfiction stories, and create computer programs while one remembers earlier inputs. This is a helpful tool for writers since it can generate coherent language even if it might still generate mistakes. By means of literature reviews, data analysis, and report writing, this tool aids researchers, students, and teachers with regard to research writing. It does, however, have certain drawbacks including ethical questions, transparency problems, and the possibility to support prejudices, which calls for human supervision for context and accuracy. Furthermore, misleading AI-generated information can result in false scientific articles endangering research credibility (Bhatia, 2023).

Research writing using artificial intelligence raises concerns since ChatGPT-generated abstracts can be indistinguishable from those produced by humans. According to a Northwestern University study by Catherine Gao's team, plagiarism checkers missed AI-generated abstracts; human reviewers did just somewhat better while AI-output detectors accurately identified only 66% of them. Furthermore, OpenAI rejects responsibility for its outputs

since chatbots lack legal personality, which makes it impossible to hold them liable. While building research and data is unethical, depending on artificial intelligence for text generation is expected to grow. Even several academic publications co-authored ChatGPT under published research articles (Bhatia, 2023).

Moreover, the difficulties students experience attaining writing competency have made instruction of writing challenging. Among the challenges ESL students encounter are limited vocabulary, bad grammar, poor spelling, student preparedness, and insufficient access to books and reading materials (Mose & Mohamad, 2019).

The students' difficulties have made it arduous for teachers to impart writing abilities. The obstacles teachers encountered in teaching writing skills include the challenging task of motivating students, catering to students with varying degrees of proficiency, dealing with more advanced topics, and managing limited time (Moses & Mohamad, 2019).

On the other hand, students may encounter limited availability of internet connectivity beyond school premises, technical difficulties with the software or platforms utilized for online assignments, and face distractions due to multitasking. This is a distraction to them. Additionally, there is an increased likelihood of academic dishonesty (Juarez et al., 2023).

According to the survey, teachers believe that students' use of AI-powered tools may diminish their capacity to produce appropriate, acceptable, original content. Since students rely on tools for word recommendations and tone correction, anything they write will be automatically read in a highly mechanical and standardized manner (Milnes, 2023).

Furthermore, a significant drawback of technology is that if students become overly dependent on it for their writing, they may be at a loss without digital assistance. Students should be encouraged to engage in manual writing, utilizing their orthography, syntax, and analytical abilities, to refine their talents and acquire proficiency in tailoring their writing to suit diverse readerships (Milnes, 2023).

Methodology

The researcher used a descriptive research design to gather and formulate the data to specifically determine the status of a certain study. This specific research design was quantitative in nature. The research approach of this study was made possible through the use of questionnaires for the survey. The questionnaire was validated by four experts and was tested for internal consistency with another set of students from a different school.

The respondents of this study were the two hundred and forty-three (243) Grade 12 students or thirty-nine percent (39%) of the total population in Grade 12, which was determined using the Sloven Formula. In order to determine the number of respondents needed for this study, the researcher used the stratified random sampling method.

Prior to the conduct of the study, the researcher filled out and submitted the Permit to Study Form to his senior high school head in Mabinay National High School, the public schools district supervisor (PSDS) of Mabinay III District, and the schools division superintendent (SDS) of DepEd – Division of Negros Oriental. After it was approved, the researcher submitted a letter of intent to his school division superintendent through the public school district supervisor, asking for his permission to conduct the study. The letter of intent was approved after knowing that the senior high school head of Mabinay National High School had no objections to conducting the study. He further assured the authorities through the letter of intent that all the data gathered would be deleted after completing the thesis process.

Furthermore, the letter of intent was given to the school head of Mabinay Science High School. She approved the intention of the researcher to disseminate the survey questionnaires to students through Google Form. In the questionnaire, it was made clear that all the information they supplied was treated with the greatest confidentiality and anonymity.

It took the researcher two weeks to gather the data needed from the respondents at Mabinay Science High School. The results gathered from Google Forms were transferred to Microsoft Excel. They were then given to the research statistician. Reliability-wise, the Cronbach alpha value is equal to .967 and interpreted as excellent. This means that all formulated statements or indicators are reliable.

Moreover, the survey questionnaire was given to them through Google Forms. The researcher gave the link and the letter to the Grade 12 advisers of Mabinay National High School. Furthermore, it took the researcher one month to gather all the data needed. It took him this long because it had required him to do lots of follow-up on the respondents' advisers. Some respondents said that they forgot to answer the survey on Google Form because they were busy accomplishing academic-related tasks.

The results were then given to the researcher's statistician for the analysis and interpretation of data.

Findings

This chapter presents tabulated data, analysis and interpretation of statistical data.

Table 1 Profile of the Respondents

Table 1.1. Sex

Sex	f	%
Female	138	56.8
Male	105	43.2
Total	243	100.0

Table 1.1 shows the number of male and female respondents. This illustrates that 56.8% of the respondents are female. Out of 243 student respondents, only 105, or 43.2%, are males. The findings suggest that in most educational surveys, females show higher engagement than males. Studies in education consistently reveal high female participation in both research and classroom discussions (Alshebl, 2021).

Table 1.2. Age

Age	f	%
16-17	149	61.32
18-19	57	23.46
20-21	13	5.35
22 and above	24	9.88
Total	243	100.00

Table 1.2 shows the age of the respondents. It is revealed here that most respondents (61.32%) are aged 16-17. Out of 243 student respondents, only 57, or 23.46%, are aged 18-19 years old. Moreover, only 13 (5.35%) student respondents are aged 20-21 years old. Furthermore, there are 24 (9.88%) student-respondents who are aged 22 and above that are involved in this study. This result was not very surprising. Students aged 16-17 years old are the expected ages of a typical senior high school population in the Philippines. Age distribution in secondary education reflected similar trends globally (UNESCO, 2019).

Table 1.3. Track and Strand in Senior High School

Track and Strand in SHS	f	%
Academic – ABM	17	7.0
Academic – HUMSS	120	49.4
TVL – COOKERY	4	1.6
TVL – EIM	34	14.0
TVL – HOME ECONOMICS	19	7.8
TVL – AFA	14	5.8
TVL – CSS	22	9.1
TVL – GMAW/SMAW	13	5.3
Total	243	100.00

Table 1.3 reveals the track and strand in Senior High School of the respondents. It is illustrated in this table that most of the respondents (49.4%) come from the Academic track – Humanities and Social Sciences (HUMSS) strand with 120 students-respondents, the second most number of student-respondents (14%) come from Technology, Vocational, and Livelihood (TVL) – Electrical Installation and Maintenance (EIM) strand with 34 respondents, while the third most number of student-respondents (9.1%) come from the TVL – Computer Systems and Servicing (CSS) strand with 22 respondents. However, the least of them come from the TVL – Cookery strand, with only four 4 (1.6%) student-respondents. The considerable inclination towards HUMSS signifies an emphasis on liberal arts, along with its suitability for AI applications in language-oriented activities. Academic choices frequently align with career aspirations and the pertinence of readily available tools (Arua & Monei, 2023).

Table 1.4. Gadgets Used

Gadgets Used	f	%
Laptop	43	11.68
Desktop	2	0.54
Tablet/iPad	30	8.15
Smartphone	225	61.14
Pocket Wi-Fi	25	6.79
Wi-Fi Router	43	11.68
Total	368	100.00

Table 1.4 illustrates the gadgets used by the respondents in writing their English research papers. The total number of respondents is two hundred forty-three (243) senior high school students, but the responses reached three hundred sixty-eight (368) because they were asked to choose as many options as they liked. It is shown that most of the respondents (61.14%) used smartphones in writing their research papers. Out of 243 student respondents, only 43 (11.68%) of them used purely laptops in writing their research papers. Almost all students have mobile phones. The ratio of smartphones to students is nearly 1:1. The heavy reliance on smartphones suggests limited resources or preferences for portability. This gadget has the highest degree of portability and affordability compared to other devices. The accessibility of mobile technology has increased reliance on smartphones for academic tasks (Husnita et al., 2023).

Table 1.5. AI-Powered Tools Used

AI-Powered Tools Used	f	%
ChatGPT	129	35.3
Grammarly	102	27.9
Quillbot	78	21.4
Cici	29	7.9
Google	17	4.7
Gemini	2	0.5
Others: Cell phones	7	1.9
Others: Laptop, Smartphone, Wi-Fi, Router	1	0.3
Total	365	100.0

Table 1.5 shows the AI-powered tools used by students in writing their English research papers. Just like in

Table 1.4, the total number of respondents is two hundred forty-three (243) senior high school students, but the responses reach three hundred sixty-five (365) because they are asked to choose as many options as they like. It is revealed in this table that most of the respondents, specifically 129 (35.3%) of the student respondents, used ChatGPT in writing their English research papers. Other AI-powered tools used by some of the respondents are Grammarly (102=27.9%), QuillBot (78=21.4%), and Cici (29=7.9%). Most students use ChatGPT to generate relevant information for their research and Grammarly to check grammatical and mechanical errors. These are the two most significant and frequent processes that students use to write their research papers. People widely adopt AI-powered tools, preferring those that simplify grammar, paraphrasing, and text generation tasks. The rise of AI tools in education is attributed to their ability to streamline writing and enhance productivity (Talayhan & Babayigit, 2023).

Table 2 The Extent of Accessibility of AI-powered tools in English Research Writing

Table 2.1. Availability of AI-Powered Tools

Availability of AI-Powered Tools	Wx	Rank	Verbal Description
a. I avail all the services and functions of an AI powered tool through a laptop.	2.15	3 rd	Low Extent
b. I use my Gcash account to pay and avail the premium version of an AI tool to unlock and use all its features.	2.00	4 th	Low Extent
c. I ask my classmates and friends' permission to borrow their premium accounts so that I can avail all the AI's features for free.	2.16	2 nd	Low Extent

d. I avail all the services and functions of an AI powered tool through my smartphone/tablet.	3.17	1 st	Moderate Extent
e. I use my PayPal account, Debit Card, and other paying services to avail the premium account.	1.67	5 th	Very Low Extent
Composite Mean	2.23		Low Extent

Table 2.1 shows the availability of AI-powered tools. It shows an average score of 2.23, which falls under the "low extent" category, indicating that respondents used AI-powered tools to some degree, but these tools were not equally easy to access in all areas.

The use of smartphones or tablets to access AI tools is the most favored method. It indicates that the portability of smartphones owe to their simplicity and accessibility (Silver et al., 2019). On the other hand, the least preferred method is using PayPal or other digital payment systems. This emphasizes a limited involvement with these payment methods, either due to ignorance, inadequate access to digital financial instruments, or a choice for free versions of AI-powered applications (Maragno et al., 2023).

Table 2.2. Affordability of AI-Powered Tools

Affordability of AI-Powered Tools	Wx	Rank	Verbal Description
a. I can afford subscribing the premium version of the AI tools.	2.08	5 th	Low Extent
b. I contact groups on social media platforms such as Facebook to avail promos and discounts of the tools' premium version.	2.37	3 rd	Low Extent
c. I ask my classmates and friends to rent their tools' premium version account and use it for a few days.	2.18	4 th	Low Extent
d. I continue using the free version of the tools and not avail the premium version to save money.	3.35	2 nd	Moderate Extent
e. I use free generative AI powered tools.	3.46	1 st	High Extent
Composite Mean	2.75		Moderate Extent

Table 2.2 presents a thorough examination of respondents' perceptions regarding the affordability of AI-powered tools. With a composite mean of 2.75, categorized as "moderate extent," cost restrictions limited greater access and utilization even if there is a certain degree of affordability for AI-powered tools.

The highest-ranked item shows that respondents mostly rely on free generative AI-powered tools. This result emphasizes the general propensity toward cost-free options, showing a practical approach to resource management and the desirability of free versions that enable sufficient use for research aims (Kenchakkanavar, 2023).

Table 2.3. Reachability of AI-Powered Tools

Reachability of AI-Powered Tools	Wx	Rank	Verbal Description
a. I access the AI tools with a strong and stable internet connection.	3.04	1 st	Moderate Extent
b. I use a high-end laptop when accessing the AI tools.	2.35	4 th	Low Extent
c. I use a device that has enough battery/electric power when accessing the AI tools.	2.93	2 nd	Moderate Extent
d. I am in a location with a strong signal when accessing the AI tools.	2.93	2 nd	Moderate Extent
e. I use AI-powered tools which subscriptions are not expired	2.49	3 rd	Low Extent
Composite Mean	2.75		Moderate Extent

Table 2.3 indicates the parameters influencing the reachability of AI-powered tools. With an average score of 2.75, the reachability of AI-powered tools is considered "moderate," which means that people have limited access to these tools due to some obstacles that stop them from having full access.

The top-ranked item has to do with the use of AI technology with a robust and consistent internet connection, which earned a weighted mean (Wx) of 3.04. This finding emphasizes the critical need for consistent internet connectivity as a necessary facilitator of artificial intelligence tool availability (Awaludin et al., 2024).

Table 3 Degree of Utilization of AI-Powered Tools

Table 3.1. Degree of Utilization of AI-Powered Tools in English Research Writing as to Knowledge of Use

Knowledge of Use	Wx	Rank	Verbal Description
a. I can independently use all of the features of the AI tools	2.87	1 st	Moderate
b. I can independently use some of the features of an AI tool and I need assistance in using few of its functions.	2.77	2 nd	Moderate
c. I need the assistance of my classmates and friends in using the AI tools.	2.58	3 rd	Low
d. I ask the help of my teachers and other experts in using the AI tools.	2.48	4 th	Low
e. I do not use AI tools at all.	2.05	5 th	Low
Composite Mean	2.55		Low

Table 3.1 shows the respondents' self-evaluation of their proficiency in utilizing AI-powered tools. The composite mean of 2.55 indicates that respondents, on average, judged their knowledge and autonomous usage of AI technologies as inadequate, so they showed limited ability.

The results show a complicated spectrum of familiarity and autonomy in the application of tools driven by artificial intelligence. With a weighted mean (Wx = 2.87), item a scores first and is verbally categorized as moderate. This result shows that even if confident responders could interact autonomously with artificial intelligence systems, their expertise could be confined to basic or limited tasks. This result emphasizes a growing, rather than sophisticated, degree of familiarity with these techniques (Seo, 2021).

Table 3.2. Degree of Utilization of AI-Powered Tools in English Research Writing as to Efficiency of Functions

Efficiency of Functions	Wx	Rank	Verbal Description
a. AI powered tools can perform all the tasks I ask with no errors.	2.73	4 th	Moderate
b. AI powered tools' performance is satisfactory.	2.91	2 nd	Moderate
c. AI powered tools' performance is reliable.	2.83	3 rd	Moderate
d. AI powered tools' performance can be always trusted.	2.71	5 th	Moderate
e. AI powered tools' products are in excellent quality.	2.93	1 st	Moderate
Composite Mean	2.82		Moderate

Table 3.2 shows how respondents feel about the effectiveness of AI-powered tools in English research writing. Described as moderate, the composite mean of 2.82 reflects a shared belief: although AI tools show sufficient capacity, their efficiency levels have not reached either high or low levels.

Upon analysis of the individual items, item e attains the greatest weighted mean and is placed first, with a verbal description of moderate. The finding indicates that respondents generally acknowledged the quality of outputs produced by AI tools, albeit there was potential for enhancement. This result is encouraging, even if it suggests a possible need for improvements in AI-powered technologies to attain regularly better outcomes (Gołab-Andrzejak, 2023).

Table 3.3. Degree of Utilization of AI-Powered Tools in English Research Writing as to the Usefulness of Functions

Usefulness of Functions	Wx	Rank	Verbal Description
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a. I use AI powered tools for generating sources of information and citations.	3.05	3 rd	Moderate
b. I use AI powered tools for summarizing information.	3.11	2 nd	Moderate
c. I use AI powered tools for paraphrasing paragraphs.	3.01	5 th	Moderate
d. I use AI powered tools for spotting any grammatical error.	3.19	1 st	Moderate
e. I use AI powered tools for checking plagiarized contents.	3.02	4 th	Moderate
Composite Mean	3.08		Moderate

Table 3.3 shows how respondents view the value of AI-powered tools in many spheres of English research writing. Although respondents believe that artificial intelligence technologies are somewhat helpful for academic pursuits, the composite mean of 3.08, categorized as moderate, shows disagreement among them regarding their success or indispensable nature.

With a weighted mean of 3.19, item d ranks highest among the evaluated items, labeled as moderate. This implies that among the most useful applications of AI-driven products, participants thought grammar-checking features were. Given the critical need for grammatical accuracy in English research writing, this result emphasizes the language competency of artificial intelligence (Alzahrani & Alotaibi, 2024).

Table 4 Level of Application of AI-Powered Tools

Table 4.1 Prewriting Stage

Prewriting Stage	Wx	Rank	Verbal Description
a. I easily analyze various pieces of information with the help of tools to decide on a topic.	2.77	2 nd	Sometimes
b. I quickly find reliable sources, saving me valuable time by using these tools.	2.83	1 st	Sometimes
c. I create clear and organized outlines for my work with the assistance of tools.	2.65	4 th	Sometimes
d. I effortlessly identify the most useful and relevant sources with the help of tools.	2.74	3 rd	Sometimes
e. I simplify my planning process by using tools to generate effective mind/concept maps.	2.65	4 th	Sometimes
Composite Mean	2.73		Sometimes

Table 4.1 demonstrates the use of AI-powered tools in supporting certain tasks during the English research writing prewriting stage.

The composite mean score of 2.73 matches the verbal description of "sometimes," indicating that occasionally respondents use these instruments during the prewriting process. With a mean score of 2.83 among the individual items, the statement "I quickly find reliable sources, saving valuable time, by using these tools" ranks top. This shows that respondents understood the great worth of artificial intelligence methods in hastening the search for relevant sources. These instruments are prized for their ability to perform exact and quick searches, therefore relieving the onerous task of manually reading through large volumes of data (GnanaLilly, 2024).

Table 4.2 Writing Stage

Writing Stage	Wx	Rank	Verbal Description
a. I efficiently write the introduction and other parts of my research paper with the help of tools like ChatGPT and Quillbot.	2.80	1 st	Sometimes
b. I efficiently summarize pieces of information using the tools like Quillbot.	2.77	2 nd	Sometimes
c. I enhance my writing by paraphrasing paragraphs with the help of AI tools.	2.73	3 rd	Sometimes
d. I streamline my research process by using AI tools like ChatGPT to assist in writing the statement of the problem, significance	2.68	5 th	Sometimes

of the study, questionnaire, and other research parts.			
e. I effectively analyze and interpret my gathered data with the assistance of AI tools, saving time and improving accuracy.	2.71	4 th	Sometimes
Composite Mean	2.74		Sometimes

Table 4.2 shows the respondents' views on the application of AI-powered tools in the writing stage of an English research paper. The composite mean score of 2.74, categorized as "sometimes," indicates that respondents occasionally apply AI-powered tools for writing tasks. This finding emphasizes the partial integration of artificial intelligence technology into English research writing, therefore highlighting both their supposed advantages and their limitations in use.

"I effectively write the introduction and other parts of my research paper with the help of tools like ChatGPT and QuillBot," says the statement with the highest mean score—2.80. This activity is given top priority since respondents recognized, particularly in generating research introductions and basic segments, the time-saving benefits of artificial intelligence technology. These instruments are obviously valued for their ability to generate coherent drafts quickly, hence reducing the work involved in handwriting large portions (GnanaLilly, 2024).

Table 4.3. Rewriting Stage

Rewriting Stage	Wx	Rank	Verbal Description
a. I efficiently proofread my paragraphs with the help of AI tools like Grammarly, allowing me to save time.	2.86	1 st	Sometimes
b. I enhance my writing by using AI tools like Grammarly to edit my sentences effectively.	2.84	2 nd	Sometimes
c. I ensure grammatical accuracy with the assistance of AI tools	2.83	3 rd	Sometimes
d. I refine and improve my research paper by utilizing AI tools for revisions and rewriting.	2.77	4 th	Sometimes
e. I confidently check for plagiarism in my research with the help of AI tools.	2.74	5 th	Sometimes
Composite Mean	2.81		Sometimes

Table 4.3 shows the views of the participants about the use of AI-powered tools in the rewriting process of English research paper production. With a composite mean score of 2.81, classified as "sometimes," the respondents show occasionally depending on AI-powered tools throughout the rewriting stage.

"I efficiently proofread my paragraphs with the help of AI tools like Grammarly, allowing me to save time," says the specific assignment with the highest mean score—2.86. This item ranks first because it highlights the effectiveness of artificial intelligence techniques in reducing the time and effort needed for proofreading. The findings show that consumers depend on AI-driven grammar and style checks to find surface mistakes, hence enabling proofreading (Rezgui, 2024). The "Sometimes" classification suggests that users might still personally check or improve the outputs to ensure conformity with scholarly standards and quality.

Table 5. Strategies of Teachers in Maintaining the Integrity of English Research Writing while Using AI-Powered Tools

Strategies of teachers	Wx	Rank	Verbal Description
a. The teachers require students to write their research papers in class, not at home.	2.91	6 th	Sometimes
b. They encourage students to write their research papers without using smartphones or other gadgets.	2.94	5 th	Sometimes
c. They promote manual plagiarism checking instead of using AI plagiarism checker apps.	3.08	3 rd	Sometimes
d. They emphasize traditional research methods by discouraging the use of AI-powered tools.	3.33	1 st	Sometimes
e. They instruct students to work with printed literature, summarize and paraphrase information without the use of gadgets in the classroom.	3.16	2 nd	Sometimes

f. They guide the students to analyze and interpret gathered data without relying on digital tools.	3.06	4 th	Sometimes
Composite Mean	3.08		Sometimes

Table 5 presents the strategies that teachers use to keep students' research output academically honest in view of the increasing availability of AI-powered technologies. With a composite mean score of 3.08, the response falls into the "Sometimes," which implies that teachers hardly apply these techniques. This shows teachers' measured effort to supervise the use of digital and AI-powered technologies in order to ensure the authenticity and quality of their produced research outputs.

With a weighted mean of 3.33, the highest-ranked item indicates that "they emphasize traditional research methods by discouraging the use of AI-powered tools." This revelation highlights a major concern among educators about the possible usage of artificial intelligence in learning surroundings. The seldom application of this method shows a sensible yet adaptable attitude since some teachers might see the benefits of well-used artificial intelligence technologies. The need to foster critical thinking and originality in student work corresponds with the unwillingness to fully support such instruments (Pokrivcakova, 2019).

Table 6 Significant Effects of the Profile Variables to the Extent of Accessibility, Degree of Utilization, and Level of Application of AI-Powered Tools in English Research Writing

Table 6.1 Significant Effect of the Profile variables on the Extent of Accessibility of the AI-Powered tools in English research writing

Variables		Spearman rho (p value)	p value	Strength of the Relationship	Remarks	Decision Rule
Availability	Sex	-.003	.962	Negative Negligible Correlation	Not Significant	Failed to reject Ho
	Age	-.075	.224	Negative Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.014	.826	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	Gadgets Use	.026	.682	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	AI-Powered Tools Used	.088	.171	Positive Negligible Correlation	Not Significant	Failed to reject Ho
Affordability	Sex	.074	.250	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	Age	.018	.780	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.125	.052	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	Gadgets Use	.117	.068	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	AI- Powered Tools Used	.118	.065	Positive Negligible Correlation	Not Significant	Failed to reject Ho
Reachability	Sex	.044	.490	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	Age	-.124	.054	Negative Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.142	.026	Positive Negligible Correlation	Significant	Reject Ho
	Gadgets Use	.201	.002	Positive Negligible Correlation	Significant	Reject Ho
	AI-Powered Tools Used	.167	.009	Positive Negligible Correlation	Significant	Reject Ho

Table 6.1 offers a thorough review of the accessibility dimensions of AI-powered tools—availability, affordability, and reachability—in the context of English research writing, together with the relationship between profile variables (sex, age, track and strands, gadget use, and AI-powered tools used).

The availability of AI technologies categorizes all correlations with profile factors as negligible and statistically insignificant. For sex ($p = -0.003$, $p = 0.962$), for example, the association with age ($p = -0.075$, $p = 0.224$) shows little and non-significant link.

Comparably, the variables track and strands ($p = 0.014$, $p = 0.826$), gadget use ($p = 0.026$, $p = 0.682$), and AI-powered tools utilized ($p = 0.088$, $p = 0.171$) likewise exhibited insignificant, non-significant relationships. These findings suggest that having good facilities or a reliable internet connection was the key factor in whether AI-powered tools were available, showing that the issue is more about systems in place than about people's backgrounds or technology. This matched results from Pedro and Kumar (2020), who underline that fair access to educational technology depends much on institutional support.

Affordability-wise, the connections are still weak across most measures; nonetheless, there are clear trends in track and strand ($p = 0.125$, $p = 0.052$) and gadget use ($p = 0.117$, $p = 0.068$), which approach statistical relevance. Though it is equally small, the relationship between AI-powered tools used and affordability ($p = 0.118$, $p = 0.065$) points to a possible trend whereby students who have access to advanced tools could suffer somewhat fewer cost issues.

From the reachability dimension, where notable connections for three profile variables are found, the most important insights come. Tracks and strands show a notable but small negative connection ($p = -0.142$, $p = 0.026$), meaning that students in some educational paths could find particular difficulties obtaining AI-powered products. Different courses or unequal technological integration within academic departments could explain this. With a $p = 0.201$ and $p = 0.002$, the gadget utilized displays the largest positive association, implying that students who use modern devices are more likely to have access to technologies driven by artificial intelligence. This result is in line with the research of Oskarita and Arasy (2024), who underlined the critical need for device sophistication in improving the digital tool reachability. Furthermore, the use of AI-powered tools is favorably connected with reachability ($p = 0.167$, $p = 0.009$), therefore underlining even more the need for knowledge and prior experience with such tools in overcoming accessibility constraints.

Table 6.2. Significant Effect of the Profile variables on the Degree of utilization of the AI Powered tools in English Research Writing

Variables		Spearman rho (p value)	p value	Strength of the Relationship	Remarks	Decision Rule
Knowledge of Use	Sex	.088	.169	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	Age	-.064	.318	Negative Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.182	.004	Positive Negligible Correlation	Significant	Reject Ho
	Gadgets Use	.085	.189	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	AI-Powered Tools Used	.168	.009	Positive Negligible Correlation	Significant	Reject Ho
Efficiency of Functions	Sex	.169	.008	Positive Negligible Correlation	Significant	Reject Ho
	Age	-.061	.341	Negative Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.364	.000	Positive Slight Correlation	Significant	Reject Ho
	Gadgets Use	.326	.000	Positive Slight Correlation	Significant	Reject Ho
	AI-Powered Tools Used	.246	.000	Positive Slight Correlation	Significant	Reject Ho
Usefulness of Functions	Sex	.126	.049	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	Age	-.068	.291	Negative Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.241	.000	Positive Slight Correlation	Significant	Reject Ho
	Gadgets Use	.241	.000	Positive Slight Correlation	Significant	Reject Ho
	AI-Powered Tools Used	.197	.002	Positive Negligible Correlation	Significant	Reject Ho

Table 6.2 displays a study that looks at how the use of AI-powered tools in English research writing relates to the personal details of the respondents, such as their sex, age, academic background, gadget usage, and use of AI tools. The results show different strengths and significances of these correlations, therefore providing a comprehensive knowledge of how demographic and technological aspects interact with the use of AI tools in research writing.

For "Knowledge of Use," the results show very weak connections for sex ($r = 0.088$, $p = 0.169$), age ($r = -0.064$, $p = 0.318$), and gadget use ($r = 0.085$, $p = 0.189$), which means these factors have little effect on how well people know AI-powered tools. On the other hand, using AI-powered tools shows a noticeable but not strong link ($r = 0.168$, $p = 0.009$), suggesting that using these products a bit more helped people become more familiar with them. On the other hand, using AI-powered tools shows a notable positive insignificant association ($r = 0.168$, $p = 0.009$), implying that more exposure to these products somewhat boosted familiarity with them. Academic track/strand revealed a notable positive insignificant association ($r = 0.182$, $p = 0.004$), therefore underlining the tiny but important influence of the curricular environment on understanding of AI tool use.

In assessing "Efficiency of Functions," age ($r = -0.061$, $p = 0.341$) is not statistically significant; sex ($r = 0.169$, $p = 0.008$) shows minimal connection that is statistically significant. This suggests that while age has no appreciable effect on the perceived efficiency of AI systems, sex has a small influence. However, track and strand have a significant positive connection ($r = 0.364$, $p = 0.001$), highlighting the importance of a learning environment for effectively using AI-powered tools. Similarly, devices utilized ($r = 0.326$, $p < 0.001$) and AI-powered tools used ($r = 0.246$, $p < 0.001$) show modest positive associations, demonstrating that regular interaction with technology favorably helps to leverage AI functions.

For "Usefulness of Functions," sex ($r = 0.126$, $p = 0.049$) shows a small but statistically significant association, suggesting a marginal effect of gender on the perceived value of AI tools. Age once more indicates a small and statistically meaningless relationship ($r = -0.068$, $p = 0.291$). Particularly, the track and strand, as well as the gadget utilized, each demonstrate notable small positive relationships ($r = 0.241$, $p = 0.001$), highlighting the significance of both technological and educational exposure in shaping opinions about the utility of artificial intelligence applications. Further implying that experience with AI-powered products improves their perceived usefulness, AI-powered tool use also exhibits a minor but significant connection ($r = 0.197$, $p = 0.002$). These findings agree with recent studies that highlight the importance of being skilled with technology to make the most of artificial intelligence in educational settings (Syafuddin, 2024).

Table 6.3. Significant Effect of the Profile variables on the Level of application of the AI Powered tools in English Research Writing

	Variables	Spearman rho (p value)	p value	Strength of the Relationship	Remarks	Decision Rule
Pre-writing Stage	Sex	.244	.000	Positive Slight Correlation	Significant	Reject Ho
	Age	.029	.653	Negative Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.408	.000	Positive Slight Correlation	Significant	Reject Ho
	Gadgets Used	.307	.000	Positive Slight Correlation	Significant	Reject Ho
	AI-Powered Tools Used	.258	.000	Positive Slight Correlation	Significant	Reject Ho
Writing Stage	Sex	.212	.001	Positive Slight Correlation	Significant	Reject Ho
	Age	.001	.986	Positive Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.410	.000	Positive Substantial Correlation	Significant	Reject Ho
	Gadgets Used	.286	.000	Positive Slight Correlation	Significant	Reject Ho
	AI-Powered Tools Used	.270	.000	Positive Slight Correlation	Significant	Reject Ho
Rewriting Stage	Sex	.215	.001	Positive Slight Correlation	Significant	Reject Ho
	Age	.018	.784	Negative Negligible Correlation	Not Significant	Failed to reject Ho
	Track & Strands	.419	.000	Positive Substantial Correlation	Significant	Reject Ho
	Gadgets Used	.299	.000	Positive Slight Correlation	Significant	Reject Ho
	AI-Powered Tools Used	.265	.000	Positive Slight Correlation	Significant	Reject Ho

Table 6.3 shows a correlation analysis that examines how the characteristics of the respondents relate to how much they use AI-powered tools during the stages of English research writing—pre-writing, writing, and revising. Though with different strengths, this study demonstrates important links that provide important new perspectives on how demographic and technological elements affect the integration of artificial intelligence technologies all across the research process.

Sex shows a modest but statistically significant influence of gender on the use of AI technologies during the pre-writing stage, with $r = 0.244$, $p < 0.001$ signaling this. By comparison, age shows a minimal and statistically insignificant connection ($r = 0.029$, $p = 0.653$), suggesting no appreciable impact of age on pre-writing applications. Strongly connected with pre-writing applications ($r = 0.408$, $p = 0.001$), track and strand indicate that particular academic settings may either encourage or demand more important use of AI tools. Likewise, devices used ($r = 0.307$, $p < 0.001$) and familiarity with AI-powered tools ($r = 0.258$, $p < 0.001$) show modest positive associations, so stress the need for technological involvement in enabling the application of AI tools in first writing activities.

The link between sex and artificial intelligence tools stays rather positive and statistically significant ($r = 0.213$, $p = 0.001$) in the authoring stage. Age, however, still shows a small and statistically insignificant link ($r = 0.001$, $p = 0.686$), therefore supporting the finding that age had no appreciable influence on the use of artificial intelligence tools during this era. With a significant positive connection ($r = 0.410$, $p < 0.001$), track and strand show a greater correlation in the writing stage than in the pre-writing stage, therefore stressing the important part academic context plays in supporting the practical implementation of AI technologies for active writing tasks. Emphasizing the ongoing relevance of technology exposure during the writing phase, the gadget utilized ($r = 0.286$, $p < 0.001$) and the AI-powered tool employed ($r = 0.270$, $p < 0.001$) both maintain minor positive relationships.

Regarding sex, the analysis in the rewriting stage reflects the previous stages with a small positive and statistically significant association ($r = 0.215$, $p = 0.001$). Likewise, age is still small and statistically meaningless ($r = 0.018$, $p = 0.784$), thereby supporting the consistent result that chronological age had no appreciable impact on AI-powered tool usage throughout the research writing process. But in this stage, track and strand exhibit the strongest link ($r = 0.419$, $p = 0.001$), therefore highlighting the great impact of the academic field on editing and improving written work using AI techniques. Further underlining the importance of technical knowledge and access in the rewriting process, gadget utilization ($r = 0.299$, $p < 0.001$) and AI-powered tool usage ($r = 0.265$, $p < 0.001$) show still modest positive relationships.

These findings highlight how important the track and strand in senior high school were at all phases of the study writing process; correlations grew steadily from pre-writing to revising. They also align with current studies stressing the need for technology engagement in educational settings in improving the application of AI technologies in English research writing (Khalifa & Albadawy, 2024).

Discussion

The findings indicate that a significant proportion of senior high school students (61.32%) are female, emphasizing the importance of research and writing skills. Smartphones serve as the main devices for composing English research papers, with 35.5% utilizing ChatGPT.

The accessibility of AI-powered tools is somewhat moderate, reflected in a composite mean of 2.23, suggesting that respondents engage with them to a certain degree. Nonetheless, their accessibility is not consistently maximized across all modalities. The cost of AI-powered tools is relatively moderate, reflected in a composite mean of 2.75, suggesting that financial constraints hinder broader access and utilization. The accessibility of AI-driven products is moderate, with the top-rated item being the application of artificial intelligence technology alongside a strong and stable internet connection.

The application of AI-driven tools is assessed as moderate, with an average score of 2.55 reflecting a level of limited expertise. The performance of functions is average, with a composite mean of 2.82, suggesting that AI tools demonstrate sufficient capability, yet have not attained high levels of efficiency. The utility of functions is average, reflected by a composite mean of 3.08, suggesting that AI technologies provide some benefits for academic endeavors, yet are not regarded as particularly effective or crucial. Grammar-checking features are regarded as the most advantageous application of AI-driven tools.

This investigation delves into the utilization of AI-driven instruments throughout the prewriting, writing, and rewriting phases of English research papers. The findings indicate that a portion of participants intermittently utilize AI tools, including ChatGPT and Quillbot, for the purpose of locating credible sources and fulfilling writing assignments. During the rewriting phase, tools such as Grammarly are employed to effectively proofread paragraphs, optimizing both time and effort.

Educators employ AI-driven tools to uphold the standards of English research writing, yet they frequently advise against their utilization. They highlight the importance of conventional research techniques and advocate for students to engage with printed materials, avoiding the use of devices in the classroom. They also advise against the use of

AI plagiarism checker applications and instruct students on how to analyze and interpret data independently of digital tools. Students are encouraged to compose their research papers without the use of smartphones or other electronic devices.

The findings indicate that educators are adept at leveraging AI-driven tools to uphold the standards of English research writing, emphasizing conventional approaches while judiciously integrating technology to enhance these practices. The findings indicate that educators recognize both the advantages and disadvantages of AI-driven tools in academic research.

This investigation explores how the profiles of student-respondents influence the accessibility and use of AI-powered tools in English Research Writing. The findings indicate minimal correlations among sex, age, gadget usage, and affordability across the majority of variables. Nevertheless, significant patterns emerge regarding track and strands, gadget utilization, and the application of AI-driven tools.

Concerning reachability, the data indicates a slight negative correlation between track and strands, implying that students in specific educational pathways might encounter challenges in accessing AI-powered products. The device utilized shows the most significant positive correlation, suggesting that students who engage with contemporary gadgets are more inclined to access technologies powered by artificial intelligence. The implementation of AI-driven tools is positively associated with accessibility, highlighting the importance of prior knowledge and experience to address limitations in reachability.

Regarding the understanding of usage, minimal correlations are noted for gender, age, and device utilization, suggesting a limited impact on participants' awareness of AI-driven tools. Nonetheless, a noteworthy positive yet minimal correlation is observed with the utilization of AI-powered tools, indicating that greater exposure to these tools marginally improves familiarity with them. The academic track/strand demonstrates a significant positive negligible correlation, highlighting that the curricular context has a minor yet noteworthy influence on the understanding of AI tool usage.

During the pre-writing stage, there is a slight positive correlation between sex and the application of AI tools, indicating a minor but statistically significant influence of gender on the use of AI tools in this phase. The employment of AI tools during this phase is not significantly affected by age. The relationship between track and strand demonstrates a notable correlation during the writing phase, underscoring the essential influence of academic context in facilitating the effective use of AI tools for engaging in writing activities.

Conclusion

The study's findings on the accessibility, utilization, and implementation of AI-powered tools in English research writing provide essential insights into the evolution of technology in education. The study elucidated the degree to which mobile technology influences English research writing. The availability, cost-effectiveness, and accessibility of these tools revealed the socioeconomic gaps affecting students' capacity to effectively utilize AI technology for educational objectives. Students predominantly utilized AI tools for grammar verification, summarization, and rephrasing, indicating a concentration on limited applications rather than a comprehensive exploration of the technology's capabilities. The findings regarding the use of AI tools during the prewriting, writing, and rewriting stages indicated that students perceived these tools as advantageous for activities such as information gathering and grammatical proofreading; however, their application generally supplemented rather than replaced traditional research techniques. They also disclosed the tension between embracing technological advancements and maintaining ethical research norms. They identified distinct obstacles and ethical implications, alongside the transformative potential of AI-driven tools in improving English research writing. Students may use these powerful tools with limitations. They must not use these tools to generate information as they may make false data. Instead, use them by checking the output's grammar or for summarizing and paraphrasing purposes only. The results further necessitate focused endeavors, including enhanced technology accessibility, training programs for digital tool utilization, and institutional regulations that reconcile academic integrity with innovation.

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