

Research Skills and AI Tool Use in Research Writing: A Correlational Study Among SHS Students

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ABSTRACT

This study examined the relationship between the research skills of Senior High School (SHS) students and their use of Artificial Intelligence (AI) tools in research writing at Balayang High School during School Year 2025–2026. Grounded in the Department of Education’s vision of developing critical, independent, and innovative learners, the research addressed the growing integration of AI technologies such as ChatGPT, Grammarly, and Quillbot in academic writing. A descriptive-correlational mixed-methods design was employed, combining quantitative data from 74 Grade 12 students and qualitative insights from 10 purposively selected participants. Standardized instruments, including the Research Skills Scale and an AI usage questionnaire, were used alongside semi-structured

interviews. Findings revealed that students demonstrated moderate proficiency in research skills, particularly in problem identification, literature review, and methodology, while showing lower confidence in higher-order competencies such as statistical analysis and conceptual framework development. AI tools were widely used, primarily to support writing, idea generation, and editing tasks. A statistically significant moderate positive correlation ($r = 0.591$, $p < .001$) was found between AI tool usage and research skills, suggesting that AI can enhance research-related competencies when used appropriately. However, both quantitative and qualitative results highlighted concerns regarding overreliance, accuracy, and ethical use of AI. Students perceived AI as a supportive tool that improves efficiency and writing quality but emphasized the importance of maintaining critical thinking and academic integrity. The study concludes that while AI tools offer benefits, balanced and guided integration is essential to ensure the development of independent research skills among SHS learners.

Keywords: *Research skills, Artificial Intelligence (AI), AI tool usage, Research Writing, Academic Writing*

INTRODUCTION

Research writing is a core skill in Senior High School (SHS) as it develops students’ ability to think critically, analyze information, and contribute to academic discourse. Anchored in the Department of Education (DepEd) Vision of producing “Filipino learners who passionately love their country and whose values and competencies enable them to realize their full potential and contribute meaningfully to building the nation” (DepEd, 2013), research writing becomes a vital avenue for shaping independent, reflective, and innovative thinkers. It stands as both a personal intellectual pursuit and a national imperative—cultivating graduates who are capable of addressing pressing issues and actively participating in nation-building.

In a study by global educational technology, Anthology, it was mentioned by its Chief Executive Officer (CEO) Dahlgren as cited in an article Business World (2024) that 54% of Filipino students emerged with highest level of confidence across 11 countries with the perception that AI will help them in enhancing their engagement and interactivity among peers especially in their academic pursuits. While this is a good thing, it also raises important contemplations regarding how students critically use these AI tools, balance it with critical thinking,

and address potential challenges such as overreliance, ethical concerns, and even digital equity, particularly in education.

Despite this growing trend in this technological advancement, there remains a gap in understanding how students' use of AI tools meets with their actual research skills in the classrooms. Previous studies have focused either on the development of research competencies or on the educational implications of AI integration, but few have examined their relationship in the SHS context in the Philippines. This gap is critical because, while AI tools may assist students solve research writing issues, an overreliance on them may damage the very skills that DepEd seeks to teach.

The significance of this study arises from the growing use of AI in education, as well as a lack of clear standards governing its effective deployment. In addition to navigating a digital environment filled with AI-assisted shortcuts, SHS students must strike a balance between the convenience of these tools and the need to promote critical thinking, creativity, and academic integrity. This is because they are at the formative stage, which requires them to master essential research abilities. When developing instructional strategies, curriculum revisions, and rules for suitable AI integration, it is vital to determine whether the usage of AI promotes or impedes skill development.

As the teacher-researcher, who also serves as the Practical Research teacher at Balayang High School, it has been noticed that many students tend to rely heavily on digital tools when completing research tasks. While some use AI to enhance their outputs, others show signs of overdependence, such as difficulty in formulating research questions, limited originality in writing, and reduced persistence in problem-solving. These classroom experiences emphasize the necessity of investigating how AI determines students' research practices and checking whether it contributes to or impedes the development of essential academic skills, that sooner or later, may serve as the foundation of their higher education, professional growth, and capacity to contribute meaningfully to academic and societal advancement.

Thus, this study is conducted to determine the relationship between the research skills of SHS students and their use of AI tools in research writing. By examining not only the extent of AI use but also students' perceptions and challenges, the study provided a timely and relevant basis for schools to strike a balance between encouraging independent research competencies and embracing technological innovation.

Research Questions

This study aimed to determine the relationship between the research skills of SHS students and their use of AI tools in research writing. It seeks to assess their level of research skills, measure the extent of AI tool use, and examine how these two variables relate while also considering students' perceptions and challenges.

Specifically, the study sought to answer the following:

1. How is the level of SHS students' research skills be described in the areas of:
 - 1.1 problem identification;
 - 1.2 literature review;
 - 1.3 methodology design; and
 - 1.4 data analysis?
2. What is the extent of SHS students' use of AI tools in supporting various stages of research writing?
3. Is there a significant relationship between SHS students' research skills and their use of AI tools in research writing?
4. How do students perceive the role of AI tools in enhancing or hindering their research writing skills?
5. What challenges do SHS students face when balancing research skills development and the use of AI tools in research writing?

Hypothesis

H₀: There is no significant relationship between SHS students' research skills and their use of AI tools in research writing.

Literature Review

This study aimed to examine the relationship between AI use and research skills among Senior High School students, while also exploring their perceptions and challenges of its usage in academic contexts. This section draws on international and domestic research to provide a comprehensive overview of how students engage with AI and how this impacts their academic development. The topics include senior high school research writing, artificial intelligence in education, AI tools for research writing, AI applications, research skills, and student perspectives.

Scholarly Writing in the Senior High School Level

Research writing is a necessary academic activity in SHS where students are given the opportunity to add to the pool of knowledge and skills. The K-12 Basic Education Program integrates research in its curriculum to develop students' critical and analytical thinking skills, communication skills, and life-long learning skills. This allows them to not only interact with challenging academic issues but also apply their knowledge to real-world scenarios, make wise decisions, and make significant contributions to society at large. This course can also help in developing intellectual discipline necessary for higher education and to preferred fields as they pursue professional practice.

Central to research writing, this study is primarily anchored to the core dimensions identified in the book of Creswell and Creswell (2018) namely: problem identification, literature review, methodology design and data analysis. Problem identification enables learners to recognize gaps in knowledge and formulate researchable questions. The literature review dimension further enhances this by training students to examine prior studies, synthesize scholarly discussions with the inclusion of foreign and local literature as well as studies, and establish a foundation for the research they have chosen. Students are introduced to systematic approaches to data collection and organization through methodology design, which emphasizes ethical considerations like gaining informed consent, maintaining confidentiality, and upholding academic integrity. By connecting evidence to conclusions, data analysis teaches students how to understand findings methodically. By combining critical thinking, organized methodology, and ethical considerations into a more cohesive research practice that gives students a fundamental introduction to the field, these dimensions collectively contribute to the holistic development of research competence, enabling students to communicate their ideas clearly, logically, and persuasively.

Therefore, the teacher-researcher employed the Research Skills Scale created and utilized by Lacson and Dejos Jr. (2022) to gauge students' research abilities. According to Creswell and Creswell (2018), the fundamental dimensions of research competence such as problem identification, literature review, technique design, data analysis, as well as overall study writing, align with this instrument, making it appropriate. Additionally, the scale has been tested in earlier research, guaranteeing its dependability and capacity to precisely assess students' research abilities in these crucial domains. Adapting this scale allows the teacher-researcher to systematically assess students' competencies in conducting research while maintaining consistency with established theoretical frameworks.

By engaging students in research, the SHS curriculum in the country equips them not only with academic competencies that they can use within the four corners of the classrooms but also with the ability to engage with social realities, propose effective and efficient solutions to local problems, and embody values of responsibility while cultivating innovation. This is further corroborated by the study by Gopez et al. (2024), which claimed that incorporating research into SHS improves students' readiness for both post-secondary education and the workforce by bridging the gap between classroom theory and practical application.

Furthermore, most people believe that research writing in SHS is a comprehensive learning experience rather than just an academic obligation. The main objectives of the K-12 curriculum are represented by its fundamental dimensions, which help students develop higher-order thinking abilities, develop academic discipline, and match their learning with the larger educational vision of nation-building. Despite the acknowledged value of research in SHS, little is known about how students deal with the difficulties of research writing and how these experiences affect their capacity to use research skills in practical settings.

AI Technologies in the Field of Education

With its ability to provide individualized learning experiences, automate administrative work, and increase student engagement, AI is becoming more and more integrated into educational environments. Similar to this, more educational institutions in the Philippines are investigating AI-powered learning management systems and solutions to enhance both teaching and learning processes (Co, 2025). These initial initiatives show a growing interest in its ability to improve results, increase administrative efficiency, and promote a steady level of student participation (Soliman, 2024).

Globally, more educational institutions are implementing AI-powered solutions to improve instruction, learning, and administrative duties. The results of a study by Jin et al. (2024) that looked at the adoption methods of generative AI in higher education across 40 universities from six different regions of the world showed a proactive approach to its integration, with an emphasis on equity, instructional improvement, and academic integrity. Jala (2025) supports this by pointing out how it can help the nation with issues like individualized instruction in the face of big class numbers and even a shortage of local teachers. By understanding the global and Philippine perspectives on AI in the education sector, this further provide context for examining how SHS students use AI tools in research writing and how such tools may influence the development of their research skills.

In the Philippines, DepEd has partnered with multiple organizations in the past, with just recently this year for the launch of Education Center for AI Research (E-CAIR) together with the Southeast Asian Ministers of Education Organization (SEAMEO). The breakthrough was led by Education Secretary Sonny Angara in a vision to modernizing the education sector in the country.

Even with these opportunities, there is still a digital divide because internet connectivity is still inconsistent (Soliman, 2024). Furthermore, according to Soliman, there are risks associated with AI, including algorithmic prejudice, data privacy issues, and the possibility of widening educational disparities. Educators and legislators may create plans to provide fair access to AI technologies, train instructors and students, and set precise rules for ethical AI use by comprehending these issues in the context of SHS. In order to maximize the advantages of AI while avoiding any potential negative effects, it is imperative that these challenges be addressed. This may ultimately help SHS students build excellent research abilities and effectively use AI technologies for academic objectives.

AI Tools in Research Writing

Artificial intelligence (AI) technologies, which provide immediate support from ideation to final editing, have become essential in many phases of research writing. Numerous researches conducted both domestically and internationally support this. According to research by Villarino (2025), all rural college students in Cebu, Philippines, reported using AI tools; 78.54% of them particularly used ChatGPT, highlighting its user-friendliness. Same results were generated by Xu (2025) citing the similar tool as the lead AI primarily used for academic writing assistance. Contrary, Fabro et al. (2024) cited Grammarly and Quillbot as their highest preferences, where ChatGPT is only close behind. The provision of valuable suggestions for improvement has made both Grammarly and Quillbot as the most convenient. On a similar note, these three platforms were also reported as the most favored AI tools in the study of Demirel (2024).

AI technologies have become more popular in recent years, particularly after the pandemic, according to studies from both domestic and international references, underscoring their expanding significance in academic workflows. ChatGPT, Grammarly, Quillbot, Google Docs, Scribbr, SummarizeBot, EndNote, Turnitin, Academic PhraseBank, ProWritingAid, Google Gemini, Llama, Jenny AI, and Deepl are a few of them (Xu, 2025; Villarino, 2024; Fabro et al., 2024).

By understanding these AI tools and their use in academic writing is vital for enhancing not just only learning experience, but also opportunities in teaching strategies, and potential improvement in research quality. In addition, this allows educators to guide students on a more effective and ethical AI use, eventually helping them develop critical thinking and writing skills while avoiding over-reliance on technology. Additionally, being aware of how AI is used supports effective, superior research outputs and ultimately upholds academic integrity.

AI Integration, Research Skills Development, and Learners' Perceptions

According to Demirel's (2024) study, students who use AI tools to compose scholarly papers are nonetheless mindful of errors and ethical issues. As a proof, Spinellis (2025) discovered that though it can provide information, ChatGPT still generates fabricated a Direct Object Identifier (DOI) and author names for a paper that did not exist in the majority of its generation time. This inaccurate content may be overlooked by many researchers, including students, and mistakenly considered reliable if not properly verified.

Moreover, while many of the students today rely on AI for efficiency and convenience, there are more who testified that these tools may hinder creativity and skill development, and in case of over-reliance/dependence in the long term, this could undermine critical thinking skills and jeopardize academic integrity (Demirel, 2024). Villarino (2025) shared similar worries, noting out that students' lack of diligence in schoolwork has resulted from an over-reliance on AI. This, in turn, contributes to a decline in independent thinking, contrary to the DepEd's vision.

In addition, despite the rapid advancement of AI technologies in educational set-up, there remains a limited understanding of how students' use of AI tools relates to their actual research skills in the classroom. Globally, studies have shown that AI tools can enhance students' academic writing by improving organization, coherence, and grammar, as well as supporting idea generation and revision processes (Sanz-Tejeda et al., 2025; Song & Song, 2023). However, researchers also emphasize that excessive reliance on AI may reduce students' critical thinking, metacognitive engagement, and independent learning, potentially weakening essential research competencies (Deep & Chen, 2025; Sanz-Tejeda et al., 2025).

Through these related studies, understanding AI tools and its usage, its relation to research skills, and knowing student perceptions have become crucial as these highlights how students interact with AI tools and the effects of these interactions on their academic development. While these researches provide important understanding, most research focuses either on AI usage and its benefits in learning or on students' research skill development as separate areas. There is a shortage of data-driven research that directly examine the relationship between AI tool usage and research skills among Senior High School students, particularly in the context of Philippine Senior High Schools. This gap is critical because, although AI tools may assist students in overcoming research difficulties, an overdependence on these tools may negatively affect development of essential research skills that the DepEd aims to cultivate. Therefore, this study sought to address this gap by examining how AI tool usage relates to students' research skills among Grade 12 students at Balayang High School.

METHODS

Research Design

This study employed a descriptive-correlational mixed-methods design. The descriptive-correlational component assessed and described the level of Senior High School (SHS) students' research skills in problem identification, literature review, methodology design, data analysis, and overall research writing, as well as the extent of their AI tool usage in research writing. It also examined the relationship between these two variables.

With the objective to examine students' views on AI tools and the difficulties they encounter in establishing a balance between the development of research competencies and AI-assisted writing, the mixed-methods component incorporated qualitative data. This design offered deeper insights into the function of AI in research writing through the combination of quantitative and qualitative methods to create a more thorough knowledge of both quantifiable patterns and the underlying experiences, attitudes, and challenges of students.

Research Locale

This study was conducted at Balayang High School, located in Barangay Balayang, Victoria, Tarlac, during the School Year 2025-2026. The school offers Senior High School education under the Academic and Technical-Vocational-Livelihood (TVL) tracks, exposing students to various research-related learning experiences. Through subjects such as Practical Research, learners are provided opportunities to develop research competencies and engage in research writing activities as part of their academic requirements.

Balayang High School served as an appropriate setting for the study due to its population of Grade 12 students, who were actively involved in conducting research projects and utilizing digital tools to support academic tasks. The school's location also enabled the teacher-researcher to conveniently conduct data gathering activities, distribute and retrieve research instruments, and facilitate interviews with participants. These conditions provided access to relevant respondents and supported the collection of accurate and reliable data on students' research skills and use of AI tools in research writing.

Participants and Sampling Technique

In order to choose respondents from the entire population of 95 Grade 12 students at Balayang High School for the School Year 2025–2026, the study used a combination of stratified random selection and purposive sampling.

To ensure proportionate representation across all learning groups, the population was first categorized according to academic tracks and strands, including both the Academic Track and the Technical-Vocational-Livelihood (TVL) Track. The study was able to capture differences in research skills and AI tool usage across strands attributable to this stratification.

Ninety of the ninety-five Grade 12 students who responded in an informal survey conducted in June 2025 had previously utilized AI tools for research writing. Given their direct relevance to the study's aims, only these 90 students were deemed suitable to participate in the quantitative phase.

From this eligible population, the sample size was determined using a sample size calculator with a 95% confidence level and a 5% margin of error, resulting in a required sample of 74 respondents. These respondents were then selected through stratified random sampling, ensuring proportional representation from each track and strand while maintaining randomness within each stratum.

For the qualitative component, purposive sampling was used to select 10 participants from the same population. Selection was based on maximum variation, particularly in terms of academic track and strand, to capture a wide range of perspectives. These participants were chosen to provide in-depth insights into students' experiences, perceptions, and challenges in balancing research skills development with the use of AI tools in research writing.

Research Instrument

The primary instrument used in this study is a structured survey questionnaire. This survey was designed to gather quantitative data regarding students' research skills and their use of AI tools in academic writing. It is divided into three parts:

Part I - Frequency of AI Tools Used in Research Writing: This section gathered data on the AI tools used by Senior High School students in research writing. The information obtained was used to determine the frequency of use of each AI tool among the respondents.

Part II - Self-Reported Research Skills Scale: This section examined students' proficiency in key research topics such as problem identification, information and evidence gathering, research technique, and statistics/quantitative analysis. Respondents indicated their agreement with each statement using a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The teacher-researcher adopted the Research Skills Scale developed and used by Lacson and Dejos Jr. (2022). This instrument was suitable because it aligned with the core dimensions of research competence as outlined by Creswell and Creswell (2018), including problem identification, literature review, methodology design, data analysis, and overall research writing. Furthermore, the scale has been confirmed in previous studies, demonstrating its dependability and capacity to effectively reflect students' research skills in these crucial areas. Adopting this scale allowed the teacher-researcher to systematically assess students' competencies in conducting research while maintaining consistency with established theoretical frameworks.

Part III - AI Tools Usage in Research Writing: This section measured the extent and impact of AI tool usage. Respondents first indicated which AI tools they use and then rate statements on a 5-point Likert scale regarding the efficiency, accuracy, and effectiveness of AI tools in supporting various research tasks. This study

adopted the validated, self-designed AI in Academic Writing and Publication (AIWQ-40) questionnaire with a Likert scale developed by Guhan et al. (2023). This instrument was appropriate because it has been specifically designed to assess the frequency, purpose, and perceived effectiveness of AI tools in academic writing and research. The use of a Likert scale allowed the quantification of students' replies, resulting in a more nuanced knowledge of their AI usage patterns, while questionnaire validation assured dependability and correctness in capturing the desired notions.

Although the Research Skills Scale (Lacson & Dejos Jr., 2022) and the AIWQ-40 (Guhan et al., 2023) were previously validated, re-evaluation was necessary to ensure that the instruments remain valid within the specific educational and cultural context of SHS students in this study.

First, the questionnaire and semi-structured interview guide were subjected to content validation by experts. Master Teachers specializing in research and English instruction reviewed the instruments in terms of clarity, relevance, and alignment with the research objectives. Their feedback led to minor revisions in wording and structure to improve comprehensibility and appropriateness for the target respondents.

Second, a pilot test was conducted among a small group of SHS students who were not included in the actual sample. This process helped identify ambiguous or unclear items and ensured that the instructions and statements were easily understood. Necessary adjustments were made based on the responses and feedback gathered during the pilot testing.

In addition, qualitative method used semi-structured interviews among the participants. This approach allowed the teacher-researcher to explore students' perceptions and challenges in using AI tools for research writing in depth, while providing the flexibility to probe for additional insights and clarify responses. Similarly, the semi-structured interview guide was reviewed by experts to ensure that the questions were clear, unbiased, and capable of eliciting meaningful responses aligned with the objectives of the study.

Data Gathering

The data collection was carried out in two phases: survey administration and interviews. Prior to data gathering, the teacher-researcher secured approval from the school principal and obtained informed consent from the participants. Students were also assured of the confidentiality of their responses and the voluntary nature of their participation.

In the first phase, the survey questionnaire was administered to the participants. The questionnaires were distributed during their vacant periods or scheduled research classes to avoid disruption of academic activities. Clear instructions were provided, and students were given sufficient time to answer all parts of the survey. Completed questionnaires were collected immediately to ensure a high retrieval rate.

In the second phase, semi-structured interviews were conducted with selected participants. The interviewees were chosen purposively to represent diverse strands and exposure on AI tools. The interviews were scheduled at convenient times for the students and conducted in a quiet setting to allow focused discussion. With participants' consent, the interviews were audio-recorded and supplemented by teacher-researcher notes. Each session lasted approximately 20–30 minutes.

Following data collection, survey responses were counted, encoded, and statistically analyzed to identify relationships between research abilities and AI tool usage. Meanwhile, interview data were transcribed and thematically analyzed to give deeper insights into students' experiences and perspectives of using AI tools in research writing.

Data Analysis

The data collected for this study were examined using both quantitative and qualitative methods to offer an in-depth understanding of SHS students' research skills and utilization of AI tools in research writing.

For Research Question 1, "How is the level of SHS students' research skills be described in the areas of problem identification, literature review, methodology design, data analysis, and overall research writing?", responses from the Self-Reported Research Skills Scale were summarized using descriptive statistics such as mean and standard deviation to determine students' level of competence in each area.

For Research Question 2, “What is the extent of SHS students’ use of AI tools in supporting various stages of research writing?”, responses from the AI Tools Usage Scale were analyzed using frequency, percentage, mean, and standard deviation to determine the extent of AI tool use across different research tasks.

For Research Question 3, “Is there a significant correlation between SHS students’ research skills and their use of AI tools in research writing?”, scores from the Self-Reported Research Skills Scale and AI Tools Usage Scale were subjected to Spearman’s Rank Correlation. In addition, data gathered through semi-structured interviews were examined to provide deeper insights into students’ experiences and perceptions regarding the use of AI tools in research writing and their influence on research skill development.

For Research Question 4, “How do students perceive the role of AI tools in enhancing or hindering their research writing skills?”, data from semi-structured interview transcripts were coded and analyzed thematically to identify recurring ideas and themes that reflect students’ perceptions of AI tool usage.

Finally, for Research Question 5, “What challenges do SHS students face when balancing research skills development and the use of AI tools in research writing?”, interview responses were also analyzed thematically to extract patterns and themes describing students’ common challenges and difficulties.

Ethical Consideration

The study followed ethical guidelines to guarantee the rights, safety, and well-being of participants. Participation was fully optional, with no coercion, and students were advised that it had no effect on their grades. Students were also notified of their ability to withdraw at any moment and without penalty. The study ensured that no volunteers suffered any physical, psychological, or emotional damage. Informed permission was acquired from both students and their parents or guardians. Personal identifiers were considered as optional and kept safe, ensuring confidentiality and anonymity. Data was collected only for research purposes, published in aggregate form, and correct citation methods were employed to acknowledge all sources and avoid plagiarism.

RESULTS AND DISCUSSION

Frequency and Usage of AI Tools by SHS Students in Research Writing

Reflected in Table 1 was the commonly used AI tools in research writing by the participants of the study, with ChatGPT having the highest frequency ($f = 71$). This is followed by Quillbot ($f = 34$), Grammarly ($f = 27$), Google Docs ($f = 23$), and Google Gemini ($f = 18$). These results indicate strong reliance on AI tools for drafting, paraphrasing, and editing academic work. In contrast, tools such as EndNote ($f = 1$), Turnitin ($f = 1$), and ProWritingAid ($f = 1$) were rarely used, while LLaMA, Jenny AI, and DeepL had no usage.

Table 1. Frequency of AI Tools Used By Senior High School Students In Research Writing

AI Tool	Frequency
ChatGPT	71
SummarizeBot	11
Google Gemini	18
Grammarly	27
EndNote	1
Quillbot	34
Turnitin	1
Google Docs	23
Academic PhraseBank	4
Scribbr	11
ProWritingAid	1
Others: (Copilot, Dola, Perplexity, Cici)	7

The dominance of ChatGPT shows that students predominantly utilize generative AI for a range of tasks, including idea creation and content generating, which is consistent with research findings demonstrating that this

tool increases writing efficiency and decreases cognitive load (Mahapatra, 2024; Zhao et al., 2024). Meanwhile, the widespread use of Grammarly and Quillbot indicates students' preference for grammatical correction and paraphrasing, which is in accordance with studies indicating that AI writing assistants improve writing quality by real-time feedback (Escalante et al., 2023).

The low utilization of citation and plagiarism tools such as EndNote and Turnitin indicates that students tend to be less engaged with academic integrity tools, with an emphasis on writing content rather than citation systems. Overall, the data suggest that students depend substantially on AI for writing assistance, but rely on research and reference tools significantly less frequently. This suggests the need for a more balanced use of AI in academic writing, especially in combining writing assistance with proper research and citation practices.

Level of SHS Students' Research Skills

Problem Identification and Conceptualization Skills

Table 2 indicates that Senior High School (SHS) students generally agree that they possess problem identification and conceptualization skills, as reflected in the overall mean of 3.52. A finding emerges from the contrast between students' competence in formulating and justifying topics (e.g., writing a research title and establishing the rationale for the research, both with means of 3.70) and their neutral self-assessment in more abstract, higher-order skills such as creating concept maps and formulating research hypotheses (both with means of 3.27). This pattern suggests that while students display moderate confidence in basic research procedures, they exhibit lower confidence in handling abstract and theory-based research tasks. The neutral evaluations in these areas point to an increasing degree of skill growth, where students may rely on guided frameworks rather than self-directed conceptual thinking.

Table 2. SHS Students' Research Skills in terms of Problem Identification and Conceptualization Skills

Statement	Mean	Verbal Description
If confronted by a question/problem, I can see it as an opportunity to do research.	3.49	Agree
I can identify and ask useful, challenging questions; always curious.	3.54	Agree
I can formulate my research topic/problem based on related literatures and other sources.	3.59	Agree
I can write a research title.	3.70	Agree
I can create mind or concept mapping of my research topic/problem.	3.27	Neutral
I can generate research questions based on the topic/problem.	3.65	Agree
I can justify the reasons for conducting the research.	3.70	Agree
I can formulate my research hypotheses.	3.27	Neutral
I can elaborate key variables in my research topic.	3.54	Agree
I can indicate the scope and delimitation of my research.	3.42	Agree
Composite Mean	3.52	Agree

Legend: 1 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neutral; 3.41 – 4.20 = Agree; 4.21 – 5.00 = Strongly Agree

Recto's (2025) local study on the research capacity of SHS students in Batangas, Philippines, validates this conclusion. The study discovered that students had more skill in recognizing broad research topics and objectives, but showed lower capability in refining problems and developing conceptual frameworks. Recto argued that these challenges result from limited instruction in abstract research thinking, despite students' familiarity with basic research requirements. In contrast, an international study among university students in Ecuador highlighted that strong performance in hypothesis formulation and conceptualization is closely linked to a deep understanding of theoretical and methodological foundations (Salguero Rosero et al., 2025). Their findings point to the importance of systematic and progressive engagement with conceptual research elements, without which learners tend to remain at foundational descriptive or procedural skill levels. When viewed alongside the

present findings, this contrast reflects that SHS students' neutral ratings in hypothesis formulation may suggest developmental and instructional gaps rather than absence of interest or motivation.

Information and Evidence Seeking Skills

As shown in Table 3, SHS students generally agree that they possess information and evidence seeking skills, with an overall mean of 3.50. While students report relative ease in locating and working with information to support their topics, less certainty in comparison is observed in tasks that require evaluative judgment, such as on more critical information literacy tasks, particularly identifying appropriate scholarly sources ($M = 3.39$), evaluating source credibility ($M = 3.30$), and using citation and referencing styles ($M = 3.32$). This disparity suggests that even though students can effectively locate and transform information into usable content, they experience uncertainty in evaluating the quality and authority of sources. In other words, the skill to find information appears more developed than the skill to judge it. This pattern is significant because the ability to critically evaluate sources serves as the foundation for ethical and evidence-based research writing, especially in an educational setting increasingly saturated with technological advantage for easily accessing information in digital platforms where learners can retrieve answers within seconds.

Table 3. *SHS Students' Research Skills in terms of Information and Evidence Seeking Skills*

Statement	Mean	Verbal Description
I can gather information about my research topic through various means (e.g., electronic media, images, audio and video).	3.89	Agree
I can identify and access appropriate bibliographical resources, archives and other sources of relevant information (*including web-based resources, primary sources and repositories).	3.39	Neutral
I can assess the reliability, reputation, currency, authority and relevance of sources.	3.30	Neutral
I can evaluate the accurateness of the content by reading other sources mentioned by the writer.	3.50	Agree
When searching for information, I can arrange each item systematically.	3.51	Agree
I write down the important concepts myself using my own words to support my topic.	3.57	Agree
I can use the main ideas obtained from the information researched to support my topic.	3.47	Agree
I can combine the main ideas from one source or more to form a new idea.	3.54	Agree
I can write my references in any citation and referencing formats or styles.	3.32	Neutral
I follow ethical standards in writing related literature.	3.50	Agree
Composite Mean	3.50	Agree

Legend: 1 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neutral; 3.41 – 4.20 = Agree; 4.21 – 5.00 = Strongly Agree

These findings are corroborated by Recto (2025), who found that Filipino students were generally proficient in finding material online and summarizing content but demonstrated lesser competence in recognizing genuine academic sources and consistently implementing citation formats. Recto emphasized that students' reliance on general web sources, when combined with insufficient formal instruction in judgment of information quality acquired online, may explain their moderate confidence in these areas. Moreover, the study by Head and Eisenberg's (2009) revealed that learners often prioritize convenience and ease of use over authority and credibility when selecting sources they found online. This tendency aligns with the neutral self-assessment of SHS students in evaluating source reliability in the present results. Head and Eisenberg further argued that without clear and sustained pedagogical guidance in information literacy, students may continue to experience difficulties to transition from data gathering to critical source evaluation.

Research Methodology Skills

Table 4 shows that SHS students generally agree that they possess research methodology skills, as indicated by an overall mean of 3.43. In the results, students appear more confident in procedural methodological tasks including planning the research process ($M = 3.50$), instrument selection ($M = 3.41$), and identification of respondents ($M = 3.46$), compared to conceptual and design-oriented competencies such as developing a conceptual framework ($M = 3.34$) and selecting an appropriate research design ($M = 3.36$). This implies that, while students may adhere to outlined stages while conducting research, they might have difficulty when asked to participate in higher-level methodological thinking that involves aligning theory, design, and variables. The neutral scores in these areas imply that such abilities may still be developing rather than completely integrated.

Table 4. SHS Students' Research Skills in terms of Research Methodology Skills

Statement	Mean	Verbal Description
I can formulate a conceptual framework of my research.	3.34	Neutral
I can plan and design the research process of a research topic.	3.50	Agree
I can determine the appropriate research design or method of my research	3.36	Neutral
I understand relevant research methodologies and techniques and their appropriate application within own research area.	3.47	Agree
I can justify the principles and experimental techniques used in own research.	3.46	Agree
I can select or develop a research instrument to gather necessary data for my research.	3.41	Agree
I can determine my appropriate respondents and number of respondents necessary for my research.	3.46	Agree
I understand and apply the relevant codes of conduct and guidelines for the ethical conduct of research; seeks advice from supervisor.	3.38	Neutral
I have basic understanding of legal requirements surrounding research, e.g., Data Protection Act, Freedom of Information Act.	3.46	Agree
I can formulate a conceptual framework of my research.	3.34	Neutral
Composite Mean	3.43	Agree

Legend: 1 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neutral; 3.41 – 4.20 = Agree; 4.21 – 5.00 = Strongly Agree

This observation is reinforced by a local study by Samante (2023), who discovered that SHS students in Camarines Norte, Philippines, had significant difficulties conceptualizing and identifying relevant research procedures. The study found that, while students could complete defined research steps, they challenged with research methodology, especially when they were asked to defend frameworks and designs independently. Samante linked these issues to a lack of attention on conceptual basis in Practical Research subjects. This means that while SHS students may look competent of executing research tasks on the surface, their comprehension of the fundamental conceptual foundations of research technique remains limited. While they can follow processes and finish required components, they frequently fail when asked to independently justify methodological choices, connect frameworks to research challenges, or comprehend the logical purpose behind research designs.

Tabuena et al. (2021) provide an insightful comparison from an international perspective. According to their findings, instructional materials that clearly mimic the development of conceptual frameworks, research designs, and ethical issues boost students' grasp of research methodology significantly. The authors stressed that without specific examples and regular methodological scaffolding, students perceive methodology as a procedural obligation rather than a systematic, theory-driven process. Viewed alongside the present findings, this suggests that SHS students' moderate confidence in procedural tasks may not yet be matched by a comparable level of conceptual methodological competence. The findings further suggest that this difficulty may stem from insufficient instructional emphasis on conceptual and analytical aspects of research methodology.

Statistics / Quantitative Analysis and Evidence Evaluation Skills

The results in Table 5 suggest that SHS students demonstrate varying levels of confidence across different components of quantitative research skills. The highest mean ratings are observed in items related to organizing and interpreting data using tables and graphs ($M = 3.64$), and observing and collecting necessary data ($M = 3.54$), as well as determining what method to use ($M = 3.42$), of which all fall under the “Agree” category. These findings imply that students prefer procedural and tangible jobs, particularly those that require handling directly and visual data organization. These skills are often taught early in research discussions and are commonly used across disciplines, which may explain why these zones have higher levels of self-assessment. Local study with Filipino SHS students showed a similar tendency, with students functioning better in data collection and presentation tasks than in analytic reasoning, indicating a curriculum-based emphasis on observable research processes (Morata & Poblete, 2024).

Table 5. SHS Students’ Research Skills in terms of Statistics / Quantitative Analysis and Evidence Evaluation Skills

Statement	Mean	Verbal Description
I can observe and collect necessary data.	3.54	Agree
I can determine which statistical tool or method analysis to use for my research.	3.42	Agree
I can perform common statistical tools in any statistical applications like MS Excel, SPSS, Minitab, or others app.	3.22	Neutral
I can analyze and interpret the results of my statistical treatment or method analysis.	3.11	Neutral
I can evaluate and systematically organize the data I have gathered.	3.38	Neutral
I can draw conclusions from patterns and themes gathered from the data.	3.36	Neutral
I can organize and interpret data using tables and graphs.	3.64	Agree
I can observe and collect necessary data.	3.54	Agree
I can determine which statistical tool or method analysis to use for my research.	3.42	Agree
I can perform common statistical tools in any statistical applications like MS Excel, SPSS, Minitab, or others app.	3.22	Neutral
Composite Mean	3.38	Neutral

Legend: 1 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neutral; 3.41 – 4.20 = Agree; 4.21 – 5.00 = Strongly Agree

Several skill areas produce mean scores within the “Neutral” range, including the students' ability to evaluate and systematically organize gathered data ($M = 3.38$), draw conclusions from identified patterns and themes ($M = 3.36$), perform statistical procedures using applications such as MS Excel or SPSS ($M = 3.22$), and analyze and interpret statistical results ($M = 3.11$). Both data suggest that, while students may have had basic exposure to statistical tools and procedures, their confidence in using these abilities independently is moderate. Prior Philippine-based research has linked this uncertainty to insufficient chances for repeated, supervised practice in quantitative analysis, particularly in inferential statistics, which are frequently taken into account as challenging by learners (Morata & Poblete, 2024). Comparable findings have been documented in international contexts, where secondary students exhibit familiarity with statistical processes but have difficulty translating step-by-step knowledge into higher-order interpretation and reasoning (Hasim et al., 2024).

Overall, this suggests that learners are still in the process of attaining full proficiency, particularly in statistics and quantitative research skills. While they display a functioning basis for organizing, handling, and presenting data, their knowledge may be greater in fundamental or procedural activities than in more complex higher-order analytical and interpretative processes. The “Neutral” composite mean indicates that students are neither very confident nor entirely incapable of doing quantitative research. Instead, individuals may feel uncertain when dealing with more advanced statistical ideas, interpreting results, or critically analyzing evidence. Overall, the findings suggest a need for further instructional support and practice in higher-order quantitative thinking, particularly data interpretation, analysis, and evidence-based decision making.

Qualitative Findings on their Use of AI tools in conducting research

Table 6 shows reflect the key themes that emerged from students' responses during interviews regarding their experiences in conducting research and their use of AI tools. These themes reflect both the difficulties encountered and the growth achieved throughout the research process.

Table 6. *Students' Qualitative Responses on Research Experience and AI Use*

Emergent Theme	Interpretive Meaning
Research Challenges and Stress	Students experience pressure throughout the research process, including difficulties in writing, source validation, and external factors, which all causes anxiety and stress.
Skill Development and Learning Growth	Despite initial difficulties, students gradually perceived development of research skills, discipline, responsibility, and deeper understanding.

Note: The perceptions were gathered through interviews

Research Challenges and Stress

Participants A, C, D, F, G and I describe research as mentally demanding and pressure-inducing. This suggests that research tasks are not easily manageable for many students and can create anxiety. Participants C and F found technical elements of writing difficult, such as APA citation and finding reputable sources. Participant C stated, "*For me, challenging talaga siya, especially sa paghanap ng credible sources, kasi hindi pwede basta Google lang.*" [For me, it is really challenging, especially when it comes to finding credible sources, because you cannot just rely on Google alone. Participant I also found data gathering difficult, stating, "... *nahirapan ako sa data gathering kasi hindi agad sumasagot yung respondents.*" [...I had difficulty in data gathering because the respondents did not respond immediately]. This shows that research is not only about writing, but also about managing real-world data collection problems. On the other hand, Participants D and G experienced a stress peak during assessment along with cooperation activities, the former expressing, "*Nakaka-pressure siya minsan, lalo na group work tapos hindi lahat nagco-contribute equally.*" [Sometimes it feels pressuring, especially in group work when not everyone contributes equally]. This points to problems in teamwork, such as unequal contribution. Similarly, Participant A experienced pressure but found fulfillment after completion, "...*research writing is really stressful, like ang daming parts, pero fulfilling naman kapag natatapos.*" [...Research writing is really stressful because there are many parts, but it is also fulfilling when it is completed].

The qualitative findings suggest learners may feel overwhelmed by the structure and requirements of research projects but even with stress, there is still an emphasis in a sense of accomplishment after completion. Furthermore, the quantitative and qualitative data suggests that even though there is a strong foundational knowledge and concepts, learners generally still perceive research writing as a complex, stressful, and multifaceted task due to technical, procedural, and collaborative challenges in which most of its aspects require higher-order thinking skills. However, it also shows that completing a research paper can lead to a sense of fulfillment and achievement, indicating both negative and positive experiences.

Skill Development and Learning Growth

Participant H did not find any challenges nor stress but reflected how research and using AI both promote discipline and responsibility, "*Parang napilitan akong maging responsible kasi ang daming deadlines and revisions.*" [It feels like I was forced to become responsible because of so many deadlines and revisions]. It suggests that for some learners, academic workload can function as a catalyst for building work ethic and accountability rather than simply being a stressor. Similarly, Participants G and J emphasized how self-discipline and balance ensures genuine learning and understanding, where the former said, "...*honestly, I try not to rely too much, so I set a rule na I finish a section muna bago gumamit ng AI.*" [...honestly, I try not to rely too much, so I set a rule that I finish a section first before using AI].

Moreover, Participant B, similar to Participant H, was able to see the positive side of experience where initial difficulty led to gradual understanding of research concepts, especially in writing Review of Related Literature (RRL). Likewise, Participants C, F and I found that while active validation is important, independent research remains foundation and they emphasized comprehension before assistance, to which Participant C stated,

“...I make sure na I understand the topic first bago ako mag-consult sa AI, hindi ‘yung una agad AI.” [...I make sure that I understand the topic first before I consult AI, not going to AI right away]. This implies that some learners adopt a reflective and responsible approach to learning, where they recognize the value of initial difficulty in developing deeper understanding of research concepts. They highlight that self-sufficient effort and understanding should come first, before seeking external support, including AI.

Participant E, like B and H, noted that effective guidance boosts student competence and confidence, noting, “... medyo overwhelming siya at first, pero nung na-explain step by step, mas naging manageable naman.” [At first it was a bit overwhelming, but when it was explained step by step, it became more manageable]. This demonstrates that, while self-sufficient effort is crucial, advice from teachers, peers, or tools may help learners deal with challenges more effectively, eventually increasing both their skill and confidence in completing research projects.

Overall, the quantitative and qualitative findings suggest that students gain discipline, responsibility, and deeper comprehension by combining individual effort with correct supervision, with AI serving as a supplement rather than a replacement for learning.

Extent of SHS Students’ Use of AI Tools in Supporting Various Stages of Research Writing

Table 7 presents the participants’ perceptions of AI tools in research writing, revealing three interrelated themes: selective enhancement of writing processes, measured confidence in analytical outputs, and persistent reservations in trust and autonomy.

Table 7. *Extent of SHS Students’ Use of AI Tools in Supporting Various Stages of Research Writing*

Statement	Mean	Verbal Description
AI tools have improved my efficiency in conducting literature reviews.	3.32	Neutral
Using AI tools has increased the accuracy of my research findings in comparison to findings of other studies.	3.35	Neutral
AI tools have helped in generating better research findings.	3.35	Neutral
AI tools have enhanced the organization and structure of my research papers.	3.32	Neutral
AI tools have facilitated the identification of relevant research sources.	3.28	Neutral
I feel more confident in citing sources accurately due to just few AI tools.	2.95	Neutral
I feel more confident in citing sources accurately due to AI tools in general.	2.74	Neutral
AI tools have improved the quality of my academic writing.	3.41	Agree
Using AI tools has expedited the process of data analysis in my research.	3.19	Neutral
AI tools have increased the creativity in my research work.	3.47	Agree
I believe AI tools have positively impacted my research productivity.	3.41	Agree
AI tools have aided in identifying potential research gaps.	3.45	Agree
I find AI tools user-friendly and easy to navigate.	3.39	Neutral
AI tools have reduced errors in my academic writing.	3.35	Neutral
AI tools have improved the clarity and coherence of my research papers.	3.27	Neutral
AI tools have assisted in identifying potential journals for publication.	3.05	Neutral
Using AI tools has expanded the scope of my research ideas.	3.19	Neutral
AI tools have helped in managing references and citations effectively.	3.41	Agree
AI tools have made collaboration with co-authors more efficient.	3.08	Neutral
I trust the suggestions and recommendations provided by AI tools.	3.08	Neutral
I feel AI tools have enhanced the overall quality of my research output.	3.34	Neutral
AI tools have helped in paraphrasing and summarizing research content effectively.	3.38	Neutral
AI tools have increased my confidence in meeting publication requirements.	3.18	Neutral
AI tools have facilitated the integration of diverse research perspectives.	3.31	Neutral
I believe AI tools have reduced the time required for proofreading and editing.	3.22	Neutral
Using AI tools has improved the overall structure of my research manuscripts.	3.24	Neutral
AI tools have helped in avoiding plagiarism in my academic work.	3.24	Neutral
I feel more confident in conducting statistical analyses with AI-powered tools.	3.08	Neutral

AI tools have improved my ability to present complex data effectively.	3.12	Neutral
AI tools have contributed to increasing the impact of my research.	3.26	Neutral
I believe AI tools have simplified the process of formatting manuscripts.	3.33	Neutral
AI tools have helped in generating insightful visual representations of data.	3.34	Neutral
I find AI tools helpful in suggesting relevant keywords for my research.	3.41	Agree
AI tools have increased the speed of initial draft creation in my research.	3.24	Neutral
Using AI tools has improved the citation style consistency in my papers.	3.26	Neutral
AI tools have helped in enhancing the readability of my research papers.	3.45	Agree
I trust the accuracy of grammar and spell check features in AI tools.	3.27	Neutral
AI tools have facilitated better communication of my research findings.	3.12	Neutral
AI tools have contributed to improving the overall academic rigor of my work.	3.28	Neutral
I believe AI tools have positively influenced my decision-making in research.	3.20	Neutral
Composite Mean	3.26	Neutral

Selective Enhancement of Writing Quality and Idea Development

Responses indicate students' stronger appreciation for AI tools in tasks associated with foundational dimensions of writing. Higher mean scores are observed in creativity ($M=3.47$, item 10), identification of research gaps ($M=3.45$, item 12), and readability ($M=3.45$, item 36), suggesting that AI is perceived as particularly effective in idea expansion and enhancement of language use. Similarly, improvements in writing quality, productivity, and citation management typically fall into the "Agree" category. This shows that participants saw AI as a tool for improving clarity of speech and concept structure. The clustering of agreement around writing-related functions suggests that the benefits of AI are most evident in textual output. This observation is consistent with the findings of a Philippine-based study by Estacio (2025), which reported that AI tools are increasingly being used for grammar correction, paraphrasing, and even summarization, significantly assisting writing processes and facilitating a collaborative human-AI writing model. Similarly, Khalifa and Albadawy (2024) found that AI technologies are very good at idea development, content organization, and academic writing clarity. Overall, AI is seen as a helpful tool that promotes expressiveness and concept organization, corresponding with local and worldwide research demonstrating its usefulness in writing aid and idea development.

Measured Confidence in Research Rigor and Analytical Contributions

While AI tools are acknowledged for improving writing-related aspects, students' responses shift toward neutrality when evaluating higher-order research functions, such as accuracy of findings ($M=3.35$, item 2), data visualization ($M=3.34$, item 32), literature review efficiency ($M=3.32$, item 1), and overall academic rigor ($M=3.28$, item 39). This distribution suggests that students recognize the potential of AI in assisting research processes, yet they do not perceive it as having strong influence to it in areas requiring critical thinking and interpretation. The overall mean ($M=3.26$, Neutral) supports the concept that AI is viewed as supporting rather than transformational in higher-order intellectual qualities of research. Santiago et al. (2023) revealed that while Filipino researchers embrace AI technologies for improving efficiency and clarity, concerns regarding overreliance continue to exist, as does the potential impact they have on critical thinking abilities. On the worldwide level, Huff (2024) emphasizes that while AI tools are best suited for routine and preliminary work, human judgment and oversight are still required to guarantee the validity and reliability of research findings.

Persistent Reservations in Trust, Accuracy, and Academic Integrity

Lower mean values can be observed in areas involving dependence on trust, notably in referencing and arranging sources ($M=2.74$ and 2.95 , items 7 and 6), trusting AI recommendations ($M=3.08$, item 20), and confidence in statistical analysis ($M=3.08$, item 28). These findings suggest a modest hesitancy in totally relying on AI systems for activities requiring precision, accountability, and even ethical responsibility. Notably, even elements supposed to improve accuracy, such as grammar checking and citation consistency, remain in neutral agreement, implying that students utilized AI outputs with caution and exposed them to scrutiny. This reflects a perceived limitation of AI tools; while they are efficient, they are still not entirely trusted as authoritative or error-free systems.

The findings reflect broader scholarly concerns. According to Pangandaman (2024), despite AI's efficiency and analytical powers, fears like as bias, transparency, and trustworthiness continue to pose substantial barriers. It implies that consumers should be more cautious of AI-generated information, as these deficiencies may have an impact on the quality and credibility of the results. Similarly, Smeds et al. (2023) found that AI-generated material is not always 100% correct, underlining the significance of rigorous human validation. AI may occasionally offer inaccurate, incomplete, or misleading information despite seeming confident; consequently, users should not depend on it automatically without first verifying its veracity before employing it in research or academic work.

Overall, the data show that AI tools are most securely incorporated into improving writing mechanics and idea production, but its involvement in deeper research activities is helpful but slightly assessed. This reserved caution can also be interpreted favorably, since it implies that individuals continue to doubt the reliability of AI-generated products despite their confident presentation. Moreover, the relatively neutral overall stance reflects a balanced perspective in which respondents neither reject nor fully depend on AI, but instead position it as a complementary tool within a human-centered research process.

Qualitative Findings on the Academic Functions of AI

Table 8 presents the themes generated from the qualitative findings gathered from the interviews on how students utilize AI tools across different stages of research writing. Students' answers emphasize both the academic uses of AI, such as aiding with idea development, organizing, and writing, as well as the challenges and restrictions they face while using it. These perspectives help explain and support the quantitative results by illustrating the practical experiences behind students' level of AI usage.

Table 8. Students' Qualitative Responses on the Academic Functions of AI

Emergent Theme	Interpretive Meaning
AI as Academic Task Assistant	Students perceive AI as a helpful support tool that makes technical parts of research, such as citation and formatting, easier and less stressful to accomplish.
AI as Cognitive Starter / Idea Generator	Students view AI as a starting point for thinking, helping them generate initial ideas, organize thoughts, and overcome writer's block, but they still believe that final outputs should reflect their own understanding and effort.
AI as Conceptual Learning Aid	Students see AI as a learning buddy that simplifies knowledge and offers lessons easier to understand.
AI as Writing and Language Support	Students see AI as a tool that enhances their writing by improving academic tone, while recognizing that they need to review, revise, and personalize the output.

Note: The perceptions were gathered through interviews

AI as Academic Task Assistant

Participant H perceived AI tools as an assistant with technical aspects (e.g., citation), which helps in reducing difficulty with research writing processes. It also indicates that citation remains a moderate challenge for students, as referenced from Table 5 with mean ratings of 2.74 (item 7) and 2.95 (item 6), Participant H cited how AI tools contributed stating, "...I used AI when I was confused about citation format, like *tinulungan niya [AI] ako sa proper APA style.*" [...I used AI when I was confused about citation format, like it helped me with proper APA style]. This experience suggests that AI helps reduce difficulties in tasks that are often confusing or detail-oriented, such as applying APA style correctly. In addition, it was AI which serves as a support tool that improves efficiency and accuracy in their research papers meeting formatting requirements. This supports the quantitative findings where students agreed that they perceived AI tools have positively impacted their research productivity (M=3.41, item 11) and have helped them in managing references and citations effectively (M=3.41, item 18).

AI as Cognitive Starter / Idea Generator

Participants A, E, I and J all agreed that AI as a tool has helped them overcome writer's block, helping them to initiate academic tasks by providing draft ideas that they later personalize. Participant A explicitly stated, "...there was this time na hindi ko talaga ma-start yung introduction ko, so I used ChatGPT for ideas, then doon ako nag-base para makagawa ng sarili kong version." [...there was this time when I really couldn't start my introduction, so I used ChatGPT for ideas, then I based my own version on it to create my output]. This suggests that while AI tools were seen as a threat by many, students still perceive it as help in reducing difficulty especially in initiating academic tasks, making the writing process easier and more manageable, while still allowing them to maintain ownership of their final work.

This supports the quantitative findings where students agreed that they perceived AI tools as helpful in suggesting relevant keywords for their research ($M = 3.41$, item 33) and ease of creating their initial draft ($M = 3.24$, item 34), aided in identifying potential research gaps ($M = 3.45$, item 12) as well as a noticeable increased creativity in research work ($M = 3.47$, item 10).

AI as Writing and Language Support

On the other hand, Participants B, C, F and G found AI tools as writing and language support. The use of Quillbot and Grammarly were mentioned, Participant B stated, "...nung gumagawa kami ng RRL, nahirapan ako mag-paraphrase, so ginamit ko Quillbot, then in-edit ko na lang para maging mas accurate." [...when we were doing the RRL, I had a hard time paraphrasing, so I used Quillbot, then I just edited it to make it more accurate]. Participant C also added, "Honestly, I used Grammarly before submitting our paper, and ang dami niyang na-correct na errors na hindi ko napansin." [Honestly, I used Grammarly before submitting our paper, and it corrected a lot of errors that I didn't notice]. These results suggest that AI is being used as a supportive layer in the writing process, where students retain control over their work through revision after using the tools. Overall, AI is still perceived to function as a proofreading and language enhancement aid rather than a replacement for their own writing skills.

This supports the quantitative findings where students agreed that they perceived AI tools have helped in enhancing the readability of their research papers ($M=3.45$, item 36) as well as improved quality of their academic writing ($M=3.41$, item 8).

AI as Conceptual Learning Aid

Participant D described AI as a tutor by simplifying complex concepts, improving comprehension of challenging topics, stating, "...may time na hindi ko gets yung methodology, so I used AI to explain it in simpler terms, tapos mas naintindihan ko siya." [...there were times when I didn't understand the methodology, so I used AI to explain it in simpler terms, and then I was able to understand it better]. It suggests that AI helps bridge gaps especially in comprehension, allowing students to better grasp abstract concepts and improve understanding, breaking down terminologies into easier blocks. However, this learning support is mainly dependent on clarification and simplification rather than direct instruction from formal teaching materials.

This is consistent with the relatively consistent neutral mean ratings, which indicate moderate but not strong support of AI as a source of academic authority. As an instance, the statements "AI tools have helped in generating better research findings" ($M = 3.35$, item 3) and "Using AI tools has increased the accuracy of my research findings in comparison to findings of other studies" ($M = 3.35$, item 2) reflect perceived improvements in understanding and output quality, similar to how Participant D used AI to better grasp difficult concepts. In addition, the neutral ratings for items such as "AI tools have contributed to improving the overall academic rigor of my work" ($M = 3.28$, item 39) and "AI tools have contributed to increasing the impact of my research" ($M = 3.26$, item 30) suggest that while AI is perceived as helpful, it is not viewed as a definitive driver of scholarly quality. This mirrors the qualitative finding that AI support is primarily reliant on clarification and emphasis on simplification over formal instructional depth indicating a supportive but limited authoritative role in educational growth.

Relationship Between SHS Students' Research Skills and Their Use of AI Tools in Research Writing

Table 9 presents the relationship between SHS students' research skills and their use of AI tools in research writing. It shows the correlation coefficient, p-value, and corresponding statistical interpretation. The results were analyzed to determine whether a statistically meaningful relationship exists between the two variables.

Table 9. Relationship Between SHS Students' Research Skills and Their Use of AI Tools in Research Writing

Variables	Correlation Coefficient	p- value	Remarks
Research Skills x Use of AI Tools	0.591**	<.001	Highly Significant

The scores from the Self-Reported Research Skills Scale and AI Tools Usage Scale were subjected to Spearman's Rank Correlation. The results in Table 9 indicate a moderately strong positive correlation between the two variables ($r = .591$, $p < .001$), which is statistically significant at the 0.01 level; this suggests that as students' use of AI tools increases, their research skills also tend to improve. The low p-value ($<.001$) indicates that the association is extremely significant, rejecting the null hypothesis. Thus, there is enough data to indicate that using AI tools is strongly connected with improved research abilities in SHS students.

This finding implies that AI tools (e.g., ChatGPT, Grammarly, Quillbot, etc.) may function as support tools in the development of fundamental research competencies such as organizing ideas, improving writing quality, and even processing information. However, while the relationship is positive, it does not suggest a causal relationship; hence, other factors may also influence the development of these research skills.

The current finding is confirmed by a local research done by Dingal et al. (2024), which found a strong positive association between AI usage and students' academic writing ability, demonstrating that more interaction with AI tools improves learners' writing abilities. This is consistent with the current findings, as research skills are directly related to writing competence in academic environments.

Similarly, an international study conducted by Deep and Chen (2025) discovered that when used appropriately, AI tools can improve students' writing fluency, organization, and overall academic performance, indicating their potential to support skill development, particularly in the fields of academic writing and research. This substantiates the idea that AI-assisted tools yield positive effects to the development of research-related skills.

Overall, the findings demonstrate that the use of AI tools is significantly and positively associated with students' research skills. This demonstrates that AI technologies may be useful learning aids, particularly for enhancing research writing and associated abilities, as long as they are utilized properly and with sufficient instruction.

Qualitative Findings

Table 10 summarizes the themes that arose from students' opinions of utilizing AI in academic/research writing, emphasizing how they combine convenience with the need for critical and ethical use.

Table 10. Relationship Between SHS Students' Research Skills and Their Use of AI Tools in Research Writing

Emergent Theme	Interpretive Meaning
Dependence vs. Critical Use	Students see AI as a useful but possibly misused instrument, and they recognize the need to limit their use and retain personal effort in order to avoid losing critical thinking and accountability in their work.
Ease and Support	Students see AI as a helpful learning tool that helps students produce ideas, improve writing mechanics, organize their thoughts, and establish formal academic language, so making the writing process smoother and more controllable.

Efficiency with
Accountability

Students see AI as a time-saving tool that boosts productivity, but they are also concerned about the accuracy of its outputs, prompting them to feel the need to check information and balance efficiency with rigorous review.

Note: The perceptions were gathered through interviews

When asked about their perceptions of whether AI has made research writing easier or more difficult, all participants affirmed that it has made research writing easier. Participants A, B, D, F and I acknowledged the use of AI as a cognitive aid which supports them, thus reducing difficulty on different parts of the research process. Participant B stated, “...*mas naging madali siya, especially sa grammar and sentence construction, hindi na ako masyadong nahihirapan.*” [...it became easier, especially in grammar and sentence construction, and I no longer struggle as much]. In addition to the parts, students were also able to find help from AI in the improvement of writing fluency by making it easier for them to form correct and well-structured sentences, leading to less struggle and greater confidence in writing tasks.

Similarly, Participants C, E and H believed that AI has simplified the tasks and improved their speed, however, there is still the anxiety about correctness and reliability. Participant H mentioned, “...*easier siya kasi less time na sa paggawa, pero may pressure din na baka mali yung content.*” [...it was easier because it took less time to do, but there was also pressure that the content might be wrong]. Even though tasks become easier and require less time, there remains an underlying concern that the generated content may not always be correct or reliable.

Another theme emerged was the ‘Dependence vs. Critical Use’ which recognizes perceptions of AI as an overused tool but and may require the need for self-regulation in its use. Participants G and J both agreed that AI should not be a replacement, which needs continued effort and responsibility. Participant J said, “...*I’d say easier siya overall, pero kailangan pa rin mag-effort kasi hindi pwedeng iasa lahat sa AI.*” [I’d say it’s easier overall, but you still need to put in effort because you can’t rely on AI for everything]. This suggests that learners see a balance between utilizing AI as a useful tool and not relying too much on it. While AI simplifies tasks, they believe technology should not take the place of human labor, intellect, and responsibility.

Overall, the quantitative and qualitative data show that participants consistently see AI as a tool that boosts research writing efficiency by acting as an intellectual help, increasing grammar, sentence construction, and writing fluency. Despite these advantages, some participants continue to voice worries about the correctness and dependability of AI-generated information, creating a sense of academic pressure and ambiguity. Furthermore, both the quantitative and qualitative results show that students are becoming more aware of the importance of balancing AI use with personal effort, as they recognize the dangers of over-reliance and emphasize that AI should support rather than replace critical thinking, responsibility, and active participation throughout the research process.

Perceptions of SHS Students of the Impact of AI Tools on Research Writing Skills

Table 11 reflects the themes generated from the students’ responses in semi-structured interviews on how they perceived the impact of AI tools on their research writing skills. When asked about whether AI makes students too dependent, or does it act more as a support tool, half of the interviewed participants (A to E) acknowledged AI tools as supplementary aid in enhancing research work. Participant E stated, “...*I feel like support siya, pero kailangan talaga ng discipline para hindi ka umasa masyado.*” [...I’d say it’s easier overall, but you still need to put in effort because you can’t rely on AI for everything]. It suggests that students remain aware of the necessity of sustained effort and manage their use of AI to ensure they continue learning and maintain partial reliance rather than total dependence.

Table 11. *Students' Perceptions of the Impact of AI Tools on Research Writing Skills*

Emergent Theme	Interpretive Meaning
Balanced Perspective (Dual Role)	Students believe AI may have both positive and negative effects on research writing, depending on how it is employed, particularly in terms of independence and practice.
Conditional Use as Support Tool	AI is perceived as a helpful supplementary tool that enhances writing quality and skill development when used with moderation, discipline, and self-regulation, without replacing students' own thinking and effort.
Risk of Student Dependency	Students perceive that excessive or unregulated use of AI may lead to over-reliance, which can weaken critical thinking, analytical skills, and independent learning.

Note: The perceptions were gathered through interviews

On the other hand, Participants F, G and H saw the risks associated with using AI tools in research writing, calling for self-monitoring and discipline. Participant F mentioned, “... *it can make students dependent if ginagamit siya for everything, like kahit analysis na inaasa na lang.*” [...it can make students dependent if it is used for everything, like even analysis is just being relied on]. This implies that over time, there is likelihood of overdependency while using the tools which eventually may result to reduction of critical thinking and the development of independent learning. While this is dependent and subjective per learner, there is always a risk to be over reliant if there is no self-checking, Participant H added.

In addition, Participants I and J recognized AI's dual function as both helpful and potentially harmful depending on usage. Participant I mentioned that AI both have the advantages and risks, while dependency arises when independent practice is neglected. Overall, this highpoints the importance of balanced and responsible use of AI rather than relying on it completely.

In conclusion, while participants recognized various benefits to employing AI in the research process, they also repeatedly underlined the significance of responsible and restricted use. This common understanding points out their fear that excessive reliance on AI may erode their analytical abilities and decrease meaningful participation in the research process, reinforcing the importance of responsible and purposeful use.

Challenges and Considerations of SHS Students in AI Use

Table 12 reflects the themes generated from students' responses in the semi-structured interviews regarding how they perceived the challenges they faced when using AI in their research works. Participants A, B, D, E and H perceived AI sometimes as unreliable especially when generated outputs do not match their research needs. This limitation and inaccuracy resulted to outputs which can be vague or incorrect, leading to more confusion. Participant B stated, “...*minsan mas nakakadagdag siya ng confusion kasi mali or too general yung suggestions niya.*” [...sometimes it adds more confusion because its suggestions are wrong or too general]. This suggests that becoming overly dependent on AI without sufficient verification can negatively affect comprehension and decision-making and may compromise critical thinking in the long run, highlighting the need for critical evaluation of AI-generated suggestions.

Table 12. *Students' Qualitative Responses on Challenges and Considerations in AI Use*

Emergent Theme	Interpretive Meaning
AI Limitations and Inaccuracy	Students regard AI as an unreliable instrument that frequently generates ambiguous, inaccurate, or disordered outputs, particularly in technical and context-specific activities that need critical judgment and information reorganization.
Increased Workload and Preference for Independent Methods	Students see AI as adding to their burden since it requires verification, correction, and validation, which sometimes encourages them to depend more on conventional research techniques and their own correctness.
Pressure and Need for Balance and Support	Students are under pressure to balance creativity, instructor requirements, and time limits, while simultaneously dealing with the need for supervision and the expectation of independent work.
Unclear AI Use Boundaries and Academic Expectations	Students feel confused about the acceptable limits of AI use due to unclear guidelines and conflicting expectations regarding originality and academic requirements.

Note: The perceptions were gathered through interviews

On the other hand, some participants expressed that they need to revert to traditional methods when AI fails to provide useful outputs. Participants C, F, G, I and J found verifying AI outputs makes the research process more demanding. Participant J affirmed that there are times when AI was not able to give what they need, making research harder, “*Honestly, yes, so minsan I prefer doing it on my own kasi mas sure ako sa result...*” [Honestly, yes, so sometimes I prefer doing it on my own because I am more confident in the result...]. Though participants admitted using AI in their research writing, they noticed that there are times when its responses are not accurate, specific, or useful enough, provide unreliable or unsatisfactory outputs. Because of this, students sometimes choose to return to traditional methods, such as doing the work manually or relying on their own understanding. Instead of entirely believing AI, students feel compelled to validate the correctness of the material, and some gain confidence in the findings they create on their own.

Another discussion emerged: participants felt pressured to preserve their individuality despite limited time and resources while fulfilling formal academic requirements. Participants D, E, F, H, and I had this sentiment, as they hesitated to put in extra effort for fear of being evaluated for overusing AI. Participant D stated: “*... nahihirapan ako i-balance yung sariling idea ko and yung expectations ng teacher na very formal and well-structured...*” [...I find it difficult to balance my own ideas and the teacher’s expectations for the work to be very formal and well-structured...]. Participants feel pushed to convey their own thoughts while keeping the work professional, orderly, and academically structured. The fear of being judged even for simply using AI may further contribute to pressure and uncertainty in the entire research writing process. This reflects that students are not only managing academic expectations but are also navigating concerns about originality, credibility, and possible negative perceptions regarding AI-assisted work.

In relation to this, Participants A, B, C, G and J expressed confusion on the AI-use boundaries and academic expectations. To quote, Participant C said, “*Honestly, challenging siya lalo na kapag strict sa originality, kasi minsan nagagamit mo na yung AI pero bawal pala masyado.*” [Honestly, it is challenging, especially when strict originality is required, because sometimes you end up using AI but it turns out you are not supposed to rely on it too much]. Participant G, similarly expressed, “*... minsan nakakalito yung guidelines, like kung ano yung considered as acceptable assistance.*” [...sometimes the guidelines are confusing, like what is considered acceptable assistance]. This merely shows a lack of standardized instruction, which leads to worry, reluctance, and the potential of inadvertent academic misconduct. As a result, students may struggle to utilize AI confidently and ethically, not out of a lack of desire, but due to unclear boundaries and expectations.

Overall, overreliance on AI without sufficient verification might have a severe influence on students' comprehension, decision-making, and critical thinking abilities. As a result, many students choose to combine AI

with traditional approaches, such as double-checking facts or relying on their own expertise to acquire confidence in their efforts. Furthermore, the dread of being judged, as well as worries about originality and trustworthiness, add pressure to research writing. The absence of defined norms for AI usage contributes to uncertainty, anxiety, and the possibility of inadvertent abuse, making it difficult for students to utilize AI confidently and responsibly.

CONCLUSION

Based on the findings, Senior High School students frequently use AI tools, particularly ChatGPT, QuillBot, and Grammarly, to support various stages of research writing. Students generally demonstrated acceptable levels of research skills, with stronger competence in topic development, information gathering, and research procedures, while showing less confidence in higher-order tasks such as hypothesis formulation, source evaluation, statistical analysis, and data interpretation. Both quantitative and qualitative results revealed that AI tools are mainly used to enhance writing quality, generate ideas, improve productivity, and support learning. Moreover, a significant positive relationship was found between students' use of AI tools and their research skills, suggesting that AI can serve as a valuable supplementary tool in research writing when used responsibly, critically, and with proper human judgment.

Recommendations

The following recommendations are based on the findings:

1. Standardized AI Guidelines and Training Framework

To overcome inconsistent practices, schools can create a Standardized AI Guidelines and Training Framework that outlines appropriate AI use across disciplines. This comprises structured training sessions, examples of relevant applications, and assessment standards that consider ethical AI deployment. By offering consistent direction, schools can help eliminate uncertainty, avoid misuse, and enable students to utilize AI confidently and responsibly.

2. Quantitative Thinking Through Micro-Data Projects

Schools may use Micro-Data Projects to help students build their quantitative research abilities over time by using tiny, manageable datasets. Instead than depending primarily on major research projects, students frequently evaluate graphs, spot trends, and draw conclusions based on real-world data. By comparing their findings against AI-generated interpretations, students improve their procedural and analytical skills in dealing with quantitative data.

3. AI Transparency Portfolio Requirement

An AI Transparency Portfolio may be required, in which students document all AI-related components of their work, such as prompts utilized, corrections made, and thoughts on their learning experience. This portfolio promotes ethical use, critical review, and personal contribution, so normalizing AI use while maintaining openness and accountability in academic activities.

4. Dual-Track Learning Model

A Dual-Track Learning Model may be used to balance autonomous and AI-assisted learning. In this technique, students will be required to perform assignments in two ways: manually and with AI assistance. They then compare the results and consider variations in accuracy, knowledge, and confidence. This strategy encourages self-awareness and guarantees that students do not become unduly reliant on AI while still reaping its benefits.

5. Introductory AI Familiarization Modules

Schools can provide introduction modules to students with little to no exposure with AI, gradually building familiarity and confidence. These modules can contain basic guided tasks, demonstrations, and low-stakes exercises that allow students to experiment with AI without feeling pressured. This guarantees inclusion and eliminates gaps in competency amongst students with different levels of exposure.

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