

Generative AI in Research Writing: An Exploratory Factor Analysis

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ABSTRACT

This study investigates the opportunities and challenges associated with the use of Generative Artificial Intelligence (GenAI) in research writing among graduate students and instructors. Employing a descriptive research design utilizing exploratory factor analysis (EFA), the study examines the underlying dimensions of GenAI utilization in academic writing within selected state universities. Quantitative data were collected through survey questionnaires administered to graduate students and faculty members to determine patterns of GenAI use, perceived benefits, and existing concerns.

Findings reveal that both students and instructors widely utilize GenAI for cognitive and compositional support, including idea generation, content organization, language refinement, grammar correction, and formatting assistance. Exploratory factor analysis identified multiple dimensions underlying GenAI utilization, highlighting its role in enhancing writing efficiency, research development, and higher-order thinking skills. The results further indicate that GenAI functions as both a cognitive and technical support tool that contributes to improved productivity and the overall quality of academic writing.

However, the findings also reveal significant concerns related to ethical issues, academic integrity, unreliable AI-generated outputs, and the lack of clear institutional policies governing AI use in academic contexts. Respondents emphasized the importance of accountability, transparency, and critical evaluation of AI-generated content to maintain scholarly standards. Despite these challenges, the study concludes that GenAI presents substantial opportunities to support research writing when used responsibly and ethically. The study recommends the development of institutional guidelines, AI literacy initiatives, and ethical frameworks to ensure that GenAI complements rather than replaces human critical thinking and academic integrity in academic research and writing.

Keywords: Generative Artificial Intelligence, Research Writing, Opportunities, Challenges

INTRODUCTION

Research writing is a fundamental component of academic scholarship that facilitates knowledge production, critical inquiry, and scholarly communication. Traditionally, academic writing followed structured and linear processes emphasizing clarity, coherence, and methodological rigor. However, rapid technological advancements have transformed contemporary research practices, leading to the integration of digital and AI-driven tools that enhance efficiency, accessibility, and collaboration in scholarly work (Dong et al., 2023; Kurtz & Manger, 2024).

Among these innovations, Generative Artificial Intelligence (GenAI) has emerged as a transformative technology in academic writing. AI-powered tools such as ChatGPT are increasingly utilized for literature review generation, proofreading, paraphrasing, summarization, and manuscript drafting. Previous studies suggest that GenAI improves research productivity, writing quality, and workflow efficiency by automating repetitive academic tasks (GoogleCom & Shamim, 2024; Shopovski, 2024). Moreover, these technologies support interdisciplinary collaboration and accelerate knowledge production in higher education and research environments (Balat et al., 2024; Hanafi et al., 2025).

Despite these benefits, the integration of GenAI in research writing raises significant ethical and academic concerns. Existing literature highlights issues related to plagiarism, fabricated information, algorithmic bias, authorship accountability, and overreliance on AI-generated content, which may compromise research integrity and critical thinking (Jain & Jain, 2023; Rentier, 2024). Furthermore, the absence of clear institutional policies and transparency in AI-assisted writing practices creates challenges in maintaining ethical standards in scholarly publication (Tang et al., 2023). These concerns emphasize the need for responsible and ethical integration of GenAI in academic writing (Lund et al., 2024).

Although studies have explored the advantages and limitations of GenAI, empirical investigations focusing on its actual utilization in research writing among graduate students and instructors or professors remain limited, particularly in developing educational contexts. There is insufficient understanding of how academic users integrate GenAI into different stages of research writing and how they navigate its associated opportunities and challenges. This gap is particularly relevant in Philippine higher education institutions that continue to strengthen research productivity and global academic competitiveness.

Hence, this study examines the opportunities and challenges associated with the use of Generative Artificial Intelligence in research writing among graduate school students and instructors or professors. Specifically, it seeks their level of GenAI utilization in research writing, identify the issues and challenges they encounter, examine the opportunities provided by GenAI, and explore their experiences regarding its use in academic writing. Through this investigation, the study aims to contribute empirical evidence that may support the development of ethical and evidence-based frameworks for responsible GenAI integration in higher education research practices.

METHODOLOGY

Research Design

This study employed a quantitative research design utilizing Exploratory Factor Analysis (EFA) to examine the underlying dimensions of Generative Artificial Intelligence (GenAI) utilization in research writing among graduate students and faculty members. Exploratory Factor Analysis is a multivariate statistical technique commonly used to identify latent constructs and determine the factor structure of variables within a dataset, particularly in educational and social science research (Hair et al., 2019). The study focused on identifying the significant factors associated with GenAI utilization, perceived opportunities, and related challenges in research writing. Through EFA, the study was able to reduce observed variables into meaningful components that explain patterns of responses and reveal the multidimensional nature of GenAI use in academic writing contexts. This design is appropriate for investigating emerging educational technologies where underlying constructs are not yet fully established, thereby providing empirical and evidence-based insights into the integration of GenAI in research writing.

Participants and Sampling

The study was conducted in two higher education institutions in the Ilocos Region, Philippines, specifically in La Union and Pangasinan. The participants consisted of graduate students and instructors/professors involved in graduate-level education. The two state universities included in the study offer both master's and doctorate programs across various academic disciplines.

The population included 309 graduate students and 60 faculty members from the lone state university in La Union, and 749 graduate students and 72 faculty members from the lone state university in Pangasinan. In total, the study population comprised 1,190 participants, including 1,058 graduate students and 132 faculty members. From this population, a total sample of 343 respondents was obtained, consisting of graduate students ($n = 286$) and instructors/professors ($n = 57$).

The sample characteristics reflected a diverse representation of respondents from various academic disciplines and professional backgrounds, thereby providing a comprehensive perspective on the utilization of Generative Artificial Intelligence (GenAI) in research writing within graduate education contexts.

Stratified sampling was employed to ensure proportional representation of participants across academic groups and colleges. This sampling technique enhanced representativeness and minimized sampling bias, thereby strengthening the reliability and statistical rigor of the study (Taherdoost, 2022). The use of stratification was considered appropriate for exploratory factor analysis, as it facilitated adequate representation of subgroups necessary for identifying the underlying dimensions of Generative Artificial Intelligence (GenAI) utilization in research writing.

Research Instruments

A researcher-developed survey questionnaire served as the primary instrument for data collection. The instrument consisted of close-ended items measured using a five-point Likert scale to assess the level of Generative Artificial Intelligence (GenAI) utilization, perceived opportunities, and challenges encountered in research writing among graduate students and faculty members. Likert-scale questionnaires are widely used in educational and social science research because of their effectiveness in measuring attitudes, perceptions, and behavioral tendencies with high reliability and ease of interpretation (Taherdoost, 2022).

The questionnaire was structured according to the objectives of the study and designed to capture the multidimensional aspects of GenAI use in academic writing. Prior to administration, the instrument underwent expert validation to ensure content relevance, clarity, and alignment with the study constructs. Pilot testing was likewise conducted to establish the reliability and internal consistency of the instrument, making it suitable for Exploratory Factor Analysis (EFA). According to recent methodological literature, validated survey instruments are essential in factor analytic studies to ensure accurate identification of latent constructs and meaningful interpretation of factor structures (Hair et al., 2019).

Data Gathering Procedure

Prior to data collection, ethical clearance and institutional permission were secured from the respective academic authorities. Participation in the study was voluntary, and informed consent was obtained from all respondents before the administration of the survey questionnaire. To ensure anonymity and confidentiality, respondents' identities were excluded from all survey forms and research records. Codes were utilized in place of personal identifiers, and all collected data were treated with strict confidentiality and used solely for academic and research purposes. These procedures adhered to established ethical principles in educational research involving human participants ("Publication Manual of the American Psychological Association (7th Ed.)," 2020).

Following the approval process, the survey questionnaires were distributed to the identified respondents. The retrieved data were organized, encoded, and analyzed using appropriate statistical tools to determine the underlying dimensions of Generative Artificial Intelligence (GenAI) utilization, opportunities, and challenges in research writing. Exploratory Factor Analysis (EFA) was employed to identify significant latent constructs and examine the factor structure of the variables included in the study. This procedure enabled the extraction of meaningful components that explained patterns of GenAI use among graduate students and faculty members, thereby strengthening the empirical rigor and validity of the study findings (Hair et al., 2019).

Data Analysis

Exploratory Factor Analysis (EFA) was further employed to identify the underlying dimensions and relationships among variables associated with GenAI utilization in research writing. EFA is a multivariate statistical technique used to reduce complex datasets into meaningful latent constructs and determine the factor structure of observed variables.

The analysis involved examining factor loadings, eigenvalues, and variance explained to identify significant components underlying the responses of graduate students and faculty members. This method is highly recommended in educational research for validating constructs and improving the interpretability of survey-based instruments (Hair et al., 2019).

RESULTS

Tests of Sampling Adequacy and Sphericity

This study used SPSS software to conduct an EFA. The sample size for students was 286 and 57 for instructors/professors. Prior to factor analysis, in order to assess the appropriateness of the data, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of Sphericity were conducted. This test are used to determine the appropriateness of the data for factor analysis (**Shrestha, 2021**). When the KMO value is greater than 0.8-1 and the result of Barlett's test of Sphericity is significant, this means that the data is suitable for determining underlying factor structures (**Ghadrdoost et al., 2021**).

Table 1. Kaiser-Meyer-Olkin (KMO) Measure and Bartlett's Test of Sphericity for Sampling Adequacy

Statistic	Utilization				Issues and Challenges				Opportunities			
	Students		Instructors/ Professors		Students		Instructors/ Professors		Students		Instructors/ Professors	
	Value	Sig.	Value	Sig.	Value	Sig.	Value	Sig.	Value	Sig.	Value	Sig.
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.914	---	0.927	---	0.844	---	0.886	---	0.892	---	0.950	---
Bartlett's Test of Sphericity	770.175	.000	1,949.386	.000	741.333	.000	2144.580	.000	1,005.681	.000	2,700.466	.000

Table 1 presents the findings on the utilization of GenAI of students garnered a KMO value of 0.914 and 0.927 on the part of instructors/professors, which is above the threshold, implying that the correlation if variables is robust and appropriate for factor analysis. Meanwhile, the Bartlett's test of Sphericity was at 770.175 and a level of significance of $p < .000$ for students and 1949.386 and level of significance of $p < .000$ for instructors/professors, which also verifies that the data has a significant factor structure. This suggest that the data from on the Utilization of GenAI of Students and Instructors/Professors is statistically well suited for Exploratory Factor Analysis.

Next, the findings on the issues and challenges on GenAI use of students garnered a KMO value of 0.844 and 0.886 on the part of the instructors/professors which indicates a high degree of sampling adequacy, indicating that the data is suitable for determining underlying factor structures. Additionally, Bartlett's Test of Sphericity yielded a value of 741.333 with a significance level of $p < .000$ on the part of the students and 2144.580 with a significance level of $p < .000$ on the part of the instructors/professors, indicating that the correlation matrix significantly differs from an identity matrix.

Lastly, the findings on the opportunities on GenAI use of students garnered a KMO value of 0.892 and 0.950 on the part of the instructors/professors indicates a high degree of sampling adequacy, indicating that the data is suitable for determining underlying factor structures. Additionally, Bartlett's Test of Sphericity yielded a value of 1,005.681 with a significance level of $p < .000$ on the side of the student and 2,700.466 with a significance level of $p < .000$ on the part of the instructors/professors indicating that the correlation matrix significantly differs from an identity matrix.

Exploratory Factor Analysis

After establishing the suitability of the data for factor analysis through the KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity, Principal Component Analysis (PCA) was employed as the extraction method to identify the underlying factor structure of the variables (Watkins, 2021).

Eigenvalues and scree plot examination were utilized to determine the number of factors to retain. Following the Kaiser criterion, factors with eigenvalues greater than 1.0 were retained for interpretation. The scree plot was further examined to identify the point where the curve leveled off, indicating the optimal number of meaningful factors (Knekta et al., 2019).

Figure 1 presents the scree plot of the extracted components illustrating the eigenvalues associated with each of the 15 components of the utilization of Gen AI of students. The plot reveals a sharp decline in eigenvalues after the first component, followed by a more gradual leveling off, indicating the point at which additional components contribute minimally to explaining variance. According to the screen test and Kaiser's criterion (eigenvalues > 1), two components should be retained for further analysis.

Figure 1. Scree Plot of the Extracted Components of Utilization of Gen AI of students and instructor/professor

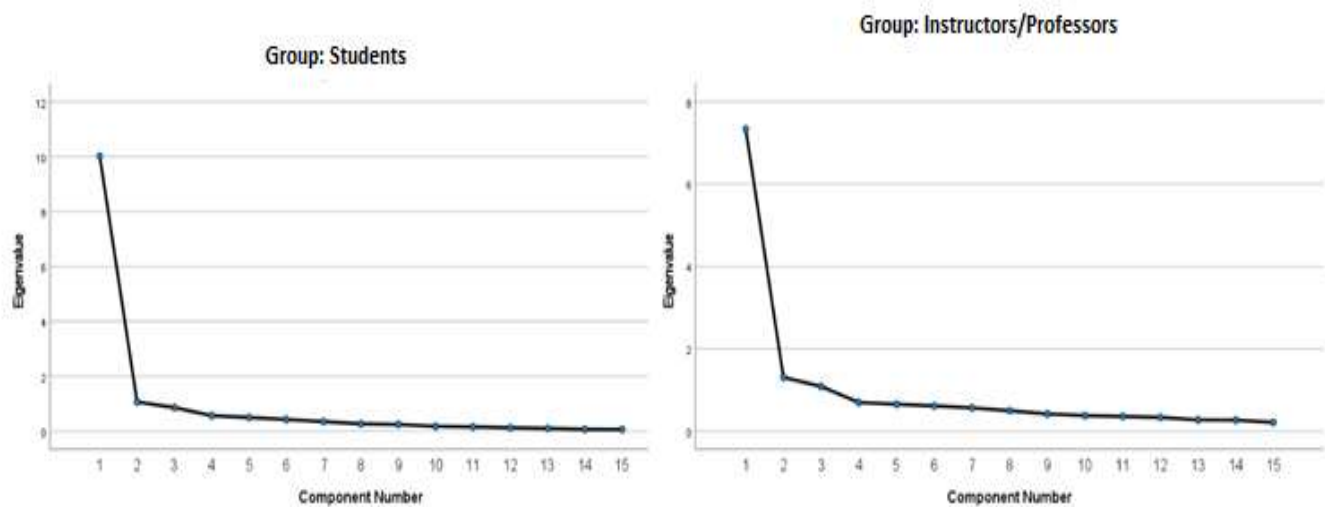


Figure 2. Scree Plot of the Extracted Components of Issues and Challenges of utilizing Gen AI of students and instructor/professors

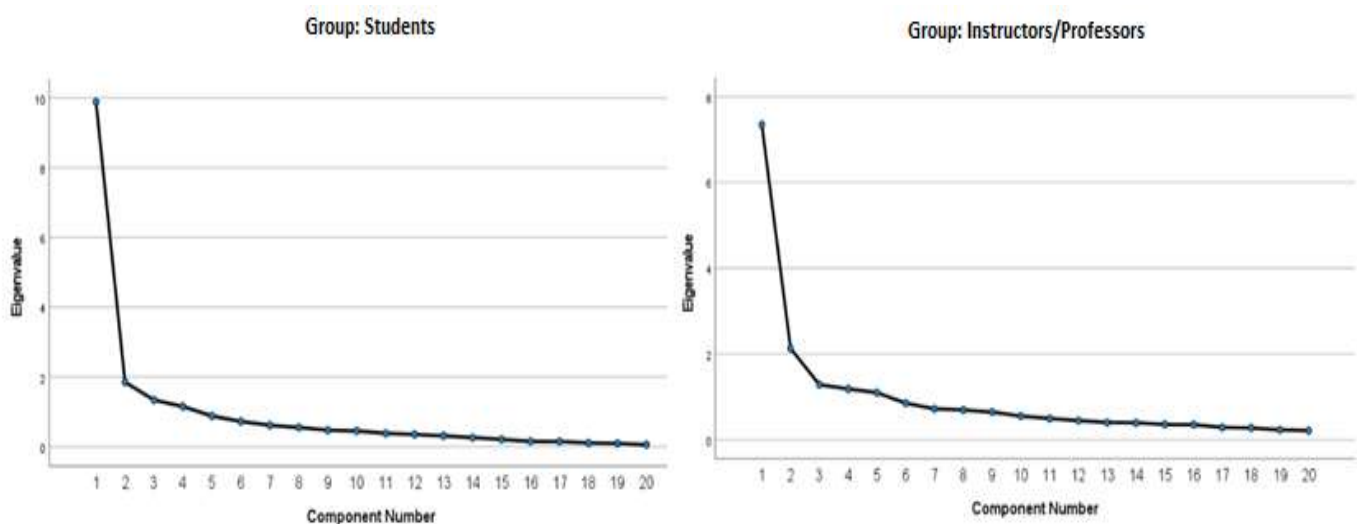


Figure 2 presents the scree plots of the extracted components illustrating the eigenvalues associated with the 20 variables pertaining to the issues and challenges in utilizing Generative Artificial Intelligence (GenAI) in research writing among students and instructors/professors. The scree plots demonstrate a sharp decline in eigenvalues after the first component, followed by a gradual leveling off of the curve, indicating the point at which succeeding components contribute minimally to the total variance explained. Based on the scree test and

Kaiser's criterion, wherein factors with eigenvalues greater than 1.0 are retained, the analysis identified four components for the student group and five components for the instructors/professors group for further factor extraction and interpretation.

Figure 3. Scree Plot of the Extracted Components of Opportunities of utilizing Gen AI of students and instructor/professors

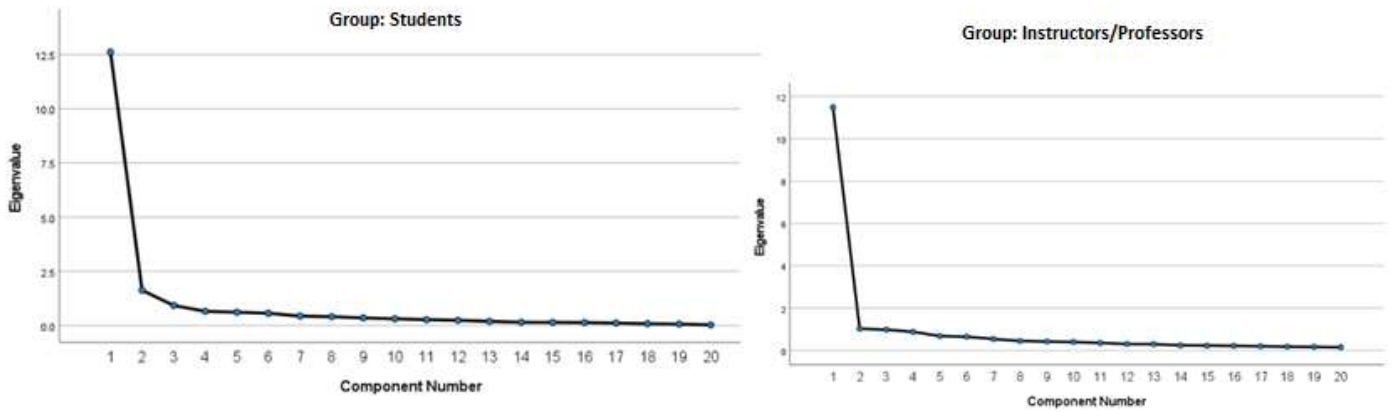


Figure 3 presents the scree plots of the extracted components illustrating the eigenvalues associated with the 20 variables related to the opportunities in utilizing Generative Artificial Intelligence (GenAI) in research writing among students and instructors/professors. The scree plots reveal a sharp decline in eigenvalues after the first component, followed by a gradual leveling off of the curve, indicating the point at which succeeding components contribute minimally to the explanation of variance. Based on the scree test and Kaiser's criterion, wherein factors with eigenvalues greater than 1.0 are retained, the analysis identified two components for both the student group and the instructors/professors group for further factor extraction and interpretation.

Subsequently, to enhance interpretability and achieve a simpler factor structure, Varimax orthogonal rotation was applied. Factor loadings of 0.40 and above were considered significant in identifying the variables associated with each component (Watkins, 2021). Items with high loadings within the same factor were grouped and interpreted according to their conceptual similarities.

The extracted factors were subsequently labeled based on the thematic characteristics of the variables with the highest loadings. The total variance explained by the retained factors was also examined to determine the adequacy of the factor solution in representing the dataset (Yong & Pearce, 2020).

Table 2 shows the factor loading values, factor characteristics, and variance explained for the remaining items that had met the requirements set.

Table 2. Utilization of GenAI on Students and Instructors/Professors EFA result.

Students			Instructors/Professors			
Utilization of Generative Artificial Intelligence	Components		Utilization of Generative Artificial Intelligence	Components		
	1	2		1	2	3
I use Generative AI to detect and reduce redundancy in my writing.	0.881		I use AI-generated suggestions to develop the structure of my paper	0.740		
I use AI tools to check the coherence and flow of my paper.	0.854		I use Generative AI to help write sections of my research paper.	0.727		

I use Generative AI to find relevant keywords or search terms for literature review.	0.840		I generate transitional phrases or connectors using AI tools.	0.705		
I generate transitional phrases or connectors using AI tools.	0.761		I use AI to help generate arguments or support points in the discussion section.	0.695		
I use AI to help generate arguments or support points in the discussion section.	0.723		I rely on Generative AI to organize my ideas before writing.	0.682		
I use AI-generated suggestions to develop the structure of my paper.	0.666		I use Generative AI to enhance the academic tone of my writing.	0.660		
I use Generative AI to help write sections of my research paper.	0.636		I use AI tools to rephrase or paraphrase text for clarity and originality.	0.630		
I rely on Generative AI to organize my ideas before writing.	0.620		I use Generative AI to find relevant keywords or search terms for literature review.	0.525		
I use AI tools to formulate or refine my research questions.		0.818	I use Generative AI to correct grammar, punctuation, and spelling.		0.790	
I use Generative AI to brainstorm or explore research topics.		0.787	I use Generative AI to detect and reduce redundancy in my writing.		0.773	
I use Generative AI to enhance the academic tone of my writing.		0.752	I use AI tools to check the coherence and flow of my paper.		0.768	
I use AI tools to rephrase or paraphrase text for clarity and originality.		0.702	I believe Generative AI improves the quality and efficiency of my final paper.		0.583	
I believe Generative AI improves the quality and efficiency of my final paper.		0.699	I use Generative AI to brainstorm or explore research topics.			0.749
I use Generative AI to correct grammar, punctuation, and spelling.		0.662	I use AI to format citations and references (e.g., APA, MLA).			0.703
I use AI to format citations and references (e.g., APA, MLA).		0.654	I use AI tools to formulate or refine my research questions.			0.611
Eigenvalue	5.75	5.34	Eigenvalue	5.75	5.34	4.21
Variance explained (%)	38.36	35.58	Variance explained (%)	38.36	35.58	28.06
Cumulative Variance explained (%)	38.36	73.93	Cumulative Variance explained (%)	38.36	73.93	28.06

On the part of the students Factor 1 contained 8 items and was identified as “AI-Assisted Academic Writing and Content Development” with a contribution of 38.36%, Factor 2 contained 7 items and was identified as “AI-Assisted Research Ideation and Writing Refinement” with a contribution of 73.93%. While on the side of the instructor/professors Factor 1 contained 8 items and identified as “AI-Assisted Academic Writing and Content Development” with a contribution of 38.35%, Factor 2 contained 4 items and identified as “AI-Assisted Writing

Quality Enhancement” with a contribution of 79.93% and Factor 3 contained 3 items and identified as “AI-Assisted Research Planning and Technical Support” with a contribution of 28.06%.

Table 3 shows the issues and challenges on GenAI used of students and instructors/professors factor loading values, factor characteristics, and variance explained for the remaining items that had met the requirements set.

On the part of the students, Factor 1 contained 7 items and was identified as “Ethical, Legal, and Institutional Concerns about AI Use in Research” with a contribution of 24.05%, Factor 2 contained 7 items also and identified as “Accountability, Transparency, and Integrity Concerns in AI Use for Research” with a contribution of 46.81%, Factor 3 contained 5 items and identified as “Accuracy, Authorship, and Appropriateness Concerns in AI-Assisted Writing” with a contribution of 63.73%, Factor 4 contained 1 item and identified as “Plagiarism” with a contribution of 71.15%. On the other hand, Factor 1 on the side of the instructors/professors contained 5 items and identified as “Issue on Responsible and Ethical Use of AI in Academic Writing” with a contribution of 17.18%, Factor 2 contained 4 items and identified as “Reliability and Accuracy Concerns in AI-Generated Content” with a contribution of 32.04%, Factor 3 contained 5 items and identified as “Concerns about Academic Skills, Originality, and Intellectual Property” with a contribution of 45.89%, Factor 4 contained 4 items and identified as “Concerns regarding Accountability, Transparency, and Ethical Guidelines in AI Use” with a contribution of 57.07%, Factor 5 contained 2 items and identified as “Legal and Policy Uncertainty in AI Use for Research” with a contribution of 65.25%.

Table 4 shows the opportunities on GenAI used of students and instructors/professors factor loading values, factor characteristics, and variance explained for the remaining items that had met the requirements set.

On the part of the students, Factor 1 contained 11 items and identified as “AI-Assisted Productivity, Writing Efficiency, and Accessibility” with a contribution of 38.57%, Factor 2 contained 9 items and identified as “AI-Assisted Research Development, Drafting, and Creativity” with a contribution of 71.23%. While on the part of instructors/professors, Factor 1 contained 12 items and identified as “AI-Assisted Writing Support, Creativity, and Research Enhancement” with a contribution of 32.33%, Factor 2 contained 8 items and identified as “AI-Assisted Productivity, Efficiency, and Research Development” with a contribution of 62.64%.

Table 3. Issues and Challenges on GenAI use of Students and Instructors/Professors EFA result.

Students					Instructors/Professors					
Issues and Challenges	Component				Issues and Challenges	Components				
	1	2	3	4		1	2	3	4	5
Clear institutional policies would encourage responsible use of AI in research.	0.880				Clear institutional policies would encourage responsible use of AI in research.	0.771				
I am unclear about the legal implications of using AI generated content in publications.	0.847				There is a need for training or workshops on ethical AI use in academic writing.	0.763				
I worry that using AI tools could inadvertently violate copyright laws.	0.836				AI should only be used to support writing, not to generate entire sections of research papers.	0.725				
There is a need for training or workshops on ethical AI use in academic writing.	0.689				AI use in writing can compromise academic integrity if not properly managed. 14. Students may	0.705				

					misuse AI tools without fully understanding the content.					
Dependence on AI tools may hinder the development of academic writing skills.	0.563				AI use in writing can compromise academic integrity if not properly managed. 14. Students may misuse AI tools without fully understanding the content.	0.699				
AI-generated references and citations are not always reliable.	0.547				I have encountered factual errors in content produced by AI tools.	0.805				
AI-generated references and citations are not always reliable.	0.449				AI-generated references and citations are not always reliable.	0.784				
Students may misuse AI tools without fully understanding the content.		0.757			AI lacks the contextual understanding required for complex research topics.	0.749				
Researchers should be held accountable for any inaccuracies produced by AI tools.		0.747			Generative AI tools often produce inaccurate or fabricated information.	0.733				
Verifying AI-generated content adds significant time to the research process.		0.725			Using AI in research writing may reduce the originality of scholarly work.		0.715			
AI-generated content should be clearly disclosed in academic research.		0.700			Dependence on AI tools may hinder the development of academic writing skills.		0.710			
Ethical guidelines for AI use in academic writing are currently insufficient.		0.691			Verifying AI-generated content adds significant time to the research process.		0.581			
Using AI in research writing may reduce the originality of scholarly work.		0.675			I worry that using AI tools could inadvertently violate copyright laws.		0.564			
Journals and institutions lack consistent policies regarding AI use in research.		0.640			I am concerned that using AI tools may lead to unintentional plagiarism.		0.532			
Generative AI tools often produce inaccurate or fabricated information.			0.760		AI-generated content should be clearly disclosed in academic research.				0.822	
AI lacks the contextual understanding required for complex research topics.			0.727		Researchers should be held accountable for any inaccuracies produced by AI tools.				0.621	

The use of AI in writing can result in authorship misrepresentation.			0.688		The use of AI in writing can result in authorship misrepresentation.				0.614	
I have encountered factual errors in content produced by AI tools.			0.546		Ethical guidelines for AI use in academic writing are currently insufficient.				0.507	
AI should only be used to support writing, not to generate entire sections of research papers.			0.507		I am unclear about the legal implications of using AI generated content in publications.					0.761
I am concerned that using AI tools may lead to unintentional plagiarism.				0.829	Journals and institutions lack consistent policies regarding AI use in research.					0.689
Eigenvalue	4.81	4.55	3.38	1.49	Eigenvalue	3.44	2.97	2.77	2.24	1.64
Variance explained (%)	24.05	22.76	16.92	7.42	Variance explained (%)	17.18	14.86	13.85	11.18	8.18
Cumulative Variance explained(%)	24.05	46.81	63.73	71.15	Cumulative Variance explained(%)	17.18	32.04	45.89	57.07	65.25

DISCUSSION

The findings of this study indicate that Generative Artificial Intelligence (GenAI) has become an increasingly significant academic support tool among graduate students and instructors/professors engaged in research writing. The extracted dimensions from the exploratory factor analysis demonstrate that both groups primarily utilize GenAI for academic writing assistance, research ideation, productivity enhancement, technical support, and manuscript refinement. These results suggest that GenAI is no longer viewed merely as an auxiliary technology but has become embedded within contemporary academic writing practices in higher education.

The factor structure among students revealed two dominant dimensions: AI-assisted academic writing and content development, and AI-assisted research ideation and writing refinement. These dimensions reflect students' extensive use of GenAI for organizing ideas, improving coherence, generating arguments, refining research questions, and enhancing the overall quality of academic manuscripts. The strong factor loadings associated with writing organization and refinement indicate that students perceive GenAI as a cognitive support mechanism that facilitates both conceptual and technical writing processes. This finding aligns with recent studies emphasizing that AI-assisted writing technologies reduce cognitive burden and improve academic engagement by supporting drafting, paraphrasing, and idea generation in scholarly writing (Kasneci et al., 2023). Similarly, UNESCO (2023) emphasized that generative AI technologies have the potential to enhance educational accessibility and learner productivity when integrated responsibly within academic environments.

Table 4. Opportunities on GenAI use of Students and Instructors/Professors EFA result.

Students			Instructor/Professors		
Opportunities	Components		Opportunities	Components	
	1	2		1	2
Using AI reduces the time I spend on repetitive writing tasks.	0.904		AI tools can offer alternative perspectives or phrasing that enhance my writing.	0.795	

Generative AI helps me write research drafts more quickly.	0.824		I find AI helpful for paraphrasing and summarizing complex ideas.	0.777	
AI tools help non-native English speakers write more effectively.	0.790		Generative AI assists in summarizing literature or previous studies.	0.713	
Generative AI helps improve the clarity and coherence of my writing.	0.784		AI makes academic writing more accessible to students and researchers at all levels.	0.698	
AI reduces language barriers in publishing research in international journals.	0.757		I use AI to explore various ways of framing or articulating research questions.	0.693	
Generative AI assists in correcting grammar and improving sentence structure.	0.747		I find AI useful in reviewing and editing my research drafts.	0.629	
I find AI helpful for paraphrasing and summarizing complex ideas.	0.713		AI helps me generate outlines or research paper structures based on prompts.	0.616	
AI increases my overall productivity during the research writing process.	0.696		Generative AI assists in correcting grammar and improving sentence structure.	0.594	
AI makes academic writing more accessible to students and researchers at all levels.	0.674		Generative AI helps improve the clarity and coherence of my writing.	0.588	
Generative AI helps me brainstorm new ideas for research topics or sections.	0.663		AI helps me generate multiple drafts for comparison and refinement.	0.585	
AI tools assist in organizing my thoughts and structuring research papers.	0.657		I believe AI can support researchers in producing higher-quality papers.	0.546	
AI can help identify gaps or weaknesses in my research arguments.		0.807	Generative AI helps me brainstorm new ideas for research topics or sections.	0.523	
AI helps me generate outlines or research paper structures based on prompts.		0.797	Generative AI helps me write research drafts more quickly.		0.833
I use AI to explore various ways of framing or articulating research questions.		0.781	AI tools help non-native English speakers write more effectively.		0.801
I find AI useful in reviewing and editing my research drafts.		0.780	Using AI reduces the time I spend on repetitive writing tasks.		0.741
I believe AI can support researchers in producing higher-quality papers.		0.778	AI increases my overall productivity during the research writing process.		0.724

Generative AI assists in summarizing literature or previous studies.		0.716	AI tools assist in organizing my thoughts and structuring research papers.		0.634
AI helps me generate multiple drafts for comparison and refinement.		0.691	AI reduces language barriers in publishing research in international journals.		0.585
AI tools can offer alternative perspectives or phrasing that enhance my writing.		0.670	AI can help identify gaps or weaknesses in my research arguments.		0.548
AI stimulates creativity in how I present and develop arguments.		0.636	AI stimulates creativity in how I present and develop arguments.		0.542
Eigenvalue	7.71	6.53	Eigenvalue	6.47	6.06
Variance explained (%)	38.57	32.66	Variance explained (%)	32.33	30.31
Cumulative Variance explained(%)	38.57	71.23	Cumulative Variance explained(%)	32.33	62.64

Among instructors/professors, three dimensions emerged: AI-assisted academic writing and content development, AI-assisted writing quality enhancement, and AI-assisted research planning and technical support. Compared with students, faculty members demonstrated broader and more specialized applications of GenAI, particularly in citation management, manuscript refinement, literature synthesis, and research planning. These findings may be associated with their active engagement in publication-oriented scholarly work and advanced research activities. The results support recent literature indicating that faculty members strategically utilize AI technologies to improve **scholarly** productivity while maintaining academic rigor and professional standards (Dwivedi et al., 2023). Moreover, the findings suggest that instructors/professors perceive GenAI as a complementary professional support tool rather than a substitute for disciplinary expertise and scholarly judgment.

Despite the widespread utilization of GenAI, significant ethical, academic, and institutional concerns were identified among both students and instructors/professors. Students' concerns clustered around ethical and legal issues, accountability and transparency, accuracy and authorship concerns, and plagiarism-related risks. These findings indicate that although students recognize the efficiency and convenience of GenAI, they remain apprehensive regarding academic integrity, originality, and overreliance on AI-generated content. Concerns surrounding fabricated information, unreliable references, and weakened critical thinking reflect broader international debates regarding responsible AI use in higher education. This finding is consistent with UNESCO (2023), which warned that generative AI systems may increase risks associated with misinformation, authorship ambiguity, and ethical misuse when institutional safeguards are absent. Likewise, Cotton et al. (2023) argued that excessive dependence on AI-generated outputs may undermine authentic learning and critical academic engagement.

Similarly, instructors/professors expressed concerns related to responsible AI use, reliability and accuracy, originality and intellectual property, accountability, and policy uncertainty. The emergence of policy-related concerns among faculty members reflects heightened awareness of the institutional and legal implications of integrating AI into academic writing and scholarly publication. Faculty respondents emphasized the necessity of ethical guidelines, disclosure policies, and institutional regulations governing AI-assisted academic work. These findings corroborate recent studies suggesting that higher education institutions worldwide continue to face challenges in establishing standardized frameworks for AI governance and responsible academic use (Bo, 2024). Furthermore, UNESCO (2023) emphasized that educational institutions must develop transparent AI governance policies that preserve academic integrity while supporting technological innovation.

The findings regarding opportunities further reinforce the transformative potential of GenAI in research writing. Students identified opportunities associated with productivity, efficiency, accessibility, research development, drafting support, and creativity enhancement. High factor loadings on rapid draft generation, grammar correction, time reduction, and research structuring suggest that GenAI substantially improves writing efficiency and accessibility, particularly for non-native English-speaking learners. These findings support previous studies indicating that AI-powered writing tools democratize academic communication by minimizing linguistic barriers and increasing participation in scholarly writing (Tlili et al., 2023). Moreover, the findings imply that GenAI may facilitate higher-order thinking processes by assisting students in organizing ideas and constructing coherent arguments during research development.

Instructors/professors similarly identified opportunities related to writing support, creativity enhancement, research development, productivity, and efficiency. Faculty members recognized GenAI's capacity to support literature synthesis, conceptual framing, and refinement of scholarly outputs. These findings align with recent evidence demonstrating that AI-assisted technologies can enhance research productivity and publication readiness when used critically and responsibly within academic contexts (Zhong & Rosli, 2025). The results further suggest that GenAI may contribute to innovation in scholarly writing by streamlining repetitive technical tasks and allowing researchers to focus on higher-level analytical and conceptual activities.

Overall, the study demonstrates that GenAI offers substantial opportunities for improving research writing while simultaneously presenting ethical, legal, and institutional challenges. The coexistence of these benefits and concerns underscores the necessity for balanced and responsible AI integration in higher education. Educational institutions must therefore establish comprehensive ethical guidelines, strengthen AI literacy initiatives, and provide training programs focused on responsible AI-assisted writing practices. These measures are essential to ensure that GenAI functions as a tool for scholarly enhancement rather than academic dependency. This perspective is supported by UNESCO (2023), which emphasized that the long-term success of AI integration in education depends on ethical governance, transparency, human oversight, and responsible pedagogical implementation.

The study contributes valuable empirical evidence regarding GenAI utilization within Philippine higher education institutions. The findings highlight that although GenAI significantly enhances productivity, creativity, and accessibility in research writing, its effectiveness ultimately depends on ethical awareness, institutional regulation, and the critical engagement of academic users. Consequently, higher education institutions should adopt evidence-based policies and pedagogical strategies that encourage transparent, ethical, and academically sound utilization of GenAI in scholarly research and writing.

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