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The Impact of Generative AI in Thesis Writing Support on Research Quality of Postgraduate Students in Pakistan: Mediating Role of Writing Confidence

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ABSTRACT

This research explores the effects of generative AI tools on thesis writing assistance and research activities among postgraduate students, with particular attention to the mediating influence of writing confidence. Data were collected from 231 respondents, comprising postgraduate students from various Pakistani universities, through structured questionnaires. SPSS version 23.0 was employed to perform several statistical analyses, including reliability and validity testing, exploratory factor analysis (EFA), and mediation analysis to examine the hypothesised relationships among constructs. The findings indicate that the application of generative AI tools markedly improves the students' research quality by increasing their confidence in academic writing. In addition, writing confidence was identified as a crucial mediating factor that linked AI assistance with better research outputs. These findings add to our knowledge of the use of digital technologies, and generative AI in particular, as powerful facilitators of achieving academic excellence. The research advances the debate on technology-enhanced learning by providing concrete recommendations on the use of AI tools in the postgraduate education system of Pakistan.

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1. Introduction

The use of generative AI technologies has fundamentally changed how learners, particularly postgraduates, conduct research and undertake writing projects. Students are now provided with real-time writing help, guidance in outlining ideas, and content refinement through AI services such as ChatGPT, GrammarlyGO, and Quillbot. The impact of generative AI on improving learning efficiency and writing fluency has been documented by several scholars (Washington, 2024; George, 2023). Indeed, the literature suggests that AI writing tools enhance students' academic achievement by alleviating cognitive load and providing meaningful feedback (El Gareh et al., 2025; Hussain, 2023). Nevertheless, there is a global knowledge gap regarding empirical studies focused on the impact of generative AI on thesis writing and research quality, particularly within developing economies like Pakistan. In Pakistan, the adoption

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of AI tools into the higher education system is still in its infancy, sporadic, and inconsistent (Hysaj et al., 2025). The country's emerging e-commerce industry is rapidly raising the level of digital skills among learners in marketing, computer science, and management fields. This context is useful for studying the use of generative AI in educational writing tasks. Despite utilizing AI for customer interaction and optimizing resources in the supply chain, E-commerce companies in Pakistan still face academic challenges at the foundational level (Khan et al., 2024; Ironsi & Solomon Ironsi, 2025). Addressing this issue may support students' engagement in higher-order thinking activities, such as constructing a thesis. Research has shown that writing confidence is a major predictor of academic achievement (Li et al., 2025).

This becomes increasingly important when the focus is on technology-enabled environments (Saleh et al, 2025). However, the relationship between generative AI and student's self-perceived writing efficacy has been understudied in the context of postgraduate education in Pakistan. To fill this gap, our work focuses on generative AI's impact on postgraduate students' research work through the lens of writing confidence as a central mediating variable. This study is important because of its contextual relevance, as well as its methodological design. With the development of e-commerce in Pakistan, there is an influx of digitally literate graduates who can undertake important research relevant to the labor market and technology. Analyzing the impact of generative AI on students' writing and researching can aid harmonious diversity in digital education policies. As far as we know, this is the first research in Pakistan which interrogates the "enablers" of the effects of AI; in this case, writing confidence to explore the psychological dimensions of its impact. The overarching gap this study addresses is the lack of empirical work on the impact of generative AI on postgraduate academic outputs within the academic framework of Pakistan. This study was anchored on the self-efficacy theory of Bandura (1999) and the Technology Acceptance Model (TAM) by Davis (1989), extending the propositions to include contemporary applications of AI. Also, in the context of South Asia, this study answers calls for research on the student engagement with new technologies (Kim et al., 2023). This research used a quantitative approach with a self-administered questionnaire distributed to 231 postgraduate students from different universities in Pakistan. Data analysis was done using SPSS 23.0 through exploratory factor analysis (EFA), reliability and validity checks, mediation analysis using bootstrapping, and other techniques. Addressing an educationally deprived yet digitally-engaged population from Pakistan, this research helps educators, policy makers, and technologies strategize on how to integrate AI technologies into the research curricula effectively.

2. Theoretical Background

Many generative AI resources emerge and proliferate in academic contexts. As such, there is an urgent need for a theoretical lens in students' research behaviors and outcomes. We base this research on three fundamental theories: Social Cognitive Theory (Bandura, 1986), Self-Efficacy Theory (Bandura, 1999), and the Technology Acceptance Model (Davis, 1989) to elaborate on the impact of generative AI tools on postgraduate students' thesis writing performance, particularly focusing on writing confidence as a mediating variable. Social Cognitive Theory highlights the critical interplay between internal mental processes, environmental contexts, and resulting behavior (Subih et al., 2024). With regard to generative AI, SCT helps to analyze the impact of certain environmental factors (like access to AI writing tools) on students' cognitive participation towards thesis writing and their academic output. There is a growing literature that has examined the impact of technological scaffolding like AI-generated prompts, grammar checks, and context-aware completions on learners' task engagement and persistence (Maphoto et al., 2024; Yeung, 2025). These AI tools act as environmental stimuli that improve students' writing behavior, which in turn enhances their research performance (Khan et al., 2023). Within SCT, other equally important elements include digital modeling and observational learning. Postgraduate AI model students' clinical writing is greatly influenced by AI generated academic text structures and argumentation frameworks as they tend to assimilate these frameworks into their writing with time (Li et al., 2025; Kim et al., 2025). In Pakistan, where institutional writing mentorship is scarce, AI serves as a self-guided interactive tutor for framework, tone, and coherence, hence shaping scholarly behaviors for the better. Self-efficacy, a domain of Bandura's Self Efficacy Theory, drives students' academic writing success, making writing confidence crucial. In this study, self-efficacy means the belief in accomplishing given high standards of quality academic research. It has been verified that students with a high level of writing self-efficacy have greater adaptability, stubbornness, and invention when performing changeling writing activities (George, 2023; Tiandem-Adamou, 2024). Moreover, the expanding research of AI in education also suggests that self-efficacy is improved by generative AI tools through anxiety reduction, clarification of academic requirements, and timely feedback (Rowland,

2023). Guided research has indicated that within context of AI-based writing support tools, perceived assistance nurtures self-esteem, especially in cases of the writer's block or confusion (Li et al., 2025; Parker et al., 2023). For these students, especially Pakistani students who have reported under supervision, AI aids function as psychological support and boost their capability– there reinforcing the independence needed to manage self-defined scholarly tasks (Hussain, 2023). The Technology Acceptance Model (Davis, 1989) provides a focal point on which to analyze the perception students have towards generative AI tools and their usage. The model explains the relationship between the intention to use and actual technology adoption framed around the concepts of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). TAM's construct has been applied in educational settings and student's willingness to utilize AI tools correlates with their perception regarding the effectiveness the tools have in improving their productivity and writing clarity (Alghizzawi et al., 2025; Al-Akash et al., 2024). More recent applications of TAM in AI contexts indicate that postgraduate students' intention to use AI tools for sophisticated academic work increases when they perceive these tools to be easy to use and helpful in enhancing the quality of their theses (Alsharwneh et al., 2024; Chanpradit, 2025). In the context of e-learning in Pakistan—often marked with infrastructural inadequacies—ease of use is particularly prominent and impacts both initial adoption and ongoing participation. Furthermore, extend models of TAM such as TAM2 and UTAUT placed emphasis on social influence and facilitating conditions as additional factors that affect usage behavior at a given time. This is useful in the context of Pakistan's academia where students instructional support has a substantial bearing as do peer recommendations regarding their decision to employ AI tools (Chan et al., 2024). Studies conducted by Ashout et al., (2024) and Almagharbeh (2025) highlighted that other contextual factors such as support from the departmental level and coursework integration foster greater acceptance of AI. Integrating the Social Cognitive Theory and Self-Efficacy Theory along with the Technology Acceptance Model (TAM), this study aims to establish the impact generative AI has on research quality via writing confidence. This framework enables us to study the use of AI tools in postgraduate research in Pakistan from cognitive, behavioral, and motivational perspectives, along with the mechanisms of the policy environment, and responsiveness shaped towards academic results.

2.1 Generative AI in Research Writing and Research Quality

The profound integration of AI tools in various educational settings has attracted the attention of many scholars regarding their efficacy in improving quality of research, particularly with postgraduate students synthesizing their theses. As defined by several authors, the quality of research is assessed through the coherence of arguments, creativity, synthesis of literature and its methodological precision. These components of research have been assisted tremendously by AI-based writing support systems (Almagharbeh et al., 2024). Following the works of Agbonselohbor et al., (2025), postgraduate students employing ChatGPT for brainstorming and structuring their theses demonstrated increased clear conceptualization of objectives and hypotheses alongside coherence with the theoretical framework. Cheng et al., (2024) noted that AI-enabled tools improve the problem statement and literature review components which increases logic and improves the scholarly contribution of the research. In a comparative study by Alghizzawi et al., (2025), thesis drafts enhanced by the use of generative AI were superior to those that were not in critical thinking, argumentation, and command of scholarly language. The AI's ability to provide repeated suggestions for feedback, recommend better words, and identify gaps in the organization contributed to these students' outcomes. Almagharbeh et al. (2024) observed AI tools help postgraduate students sustain thematic and tonal coherence, which are critical markers of research quality evaluated during thesis defenses and peer reviews. Also, Almagharbeh et al. (2025) noted students working with NLP-based AI tools showed greater accuracy in describing research methods and presenting data analysis, which are essential for assessing a thesis's scientific value. AI-Akash et al. (2024) noted such AI tools are also cognitive scaffolding because they aid students' comprehension and application of sophisticated theoretical concepts and citation styles, leading to more rigorous and responsible scholarship. In addition Agbonselohbor et al. (2025) noted that AI reduced students' reliance on faculty supervision by fostering independence and encouraging greater interaction with scholarly databases and peer-reviewed publications. These studies in concert provide compelling evidence and rationale for the proposition that generative AI materially improves the research quality of postgraduate students' theses. The AI not only alleviates cognitive burden and hastens the writing process, but also increases the intellectual intensity, scholarly depth, and evaluative benchmarks of research conducted by postgraduates.

H1: Generative-AI in Research Writing significantly enhance research quality.

2.2 Generative-AI in Thesis Writing and Writing Confidence

Tools like ChatGPT, Jasper, and GrammarlyGO Generative AI are progressively being adopted in educational contexts to help postgraduate students with organizing, drafting, and editing their theses. Many tools of this nature have been shown to enhance the quality of academic writing and increase students' confidence in their skills while tackling the thesis (Agbonselohbor et al., 2025). Writing confidence, the belief that a student possesses regarding their capacity to competently and convincingly articulate academic concepts, is very important in explaining the performance and persistence of students in writing within higher education (Chan et al., 2025). Chanpradit (2025) explains that AI-powered platforms alleviate the challenges posed by complex academic writing by providing real-time feedback on grammar, coherence, and vocabulary. These scholars found that the AI features boosted online clients' self-regulatory capabilities and writing self-efficacy through automation of basic tasks (Alsharwneh et al., 2024). Agbonselohbor et al. (2025) reported advanced AI tools enhanced postgraduate students' confidence in drafting, revising, and polishing thesis chapters because of the continuous assistance offered by the tools, especially for non-native speakers of the language or those whose disciplines contain dense technical language. Students engaging with generative AI reported significant decreases in writing-related anxiety and procrastination, according to a study by Tiandem-Adamou (2024) in South Asian universities. Saleh et Al. (2025) suggested these challenges stem from a lack of confidence; the immediacy of AI as a feedback source, combined with its non-judgmental nature, allows learners to explore, make mistakes, and learn without fear of criticism. Furthermore, Rowland (2024) noted the use of AI-based applications to aid learners in recognizing writing patterns leads to better comprehension of academic writing, which enhances familiarity with the tone, structure, and other distinguishing features of scholarly writing that aid confidence. Moreover, Li et al. (2025) observed that the use of AI paraphrasing and summarizing, as well as topic-enhancing tools, aids in independent learning and iterative drafting, which eventually fosters autonomy and proficiency in the academic voice students employ. Subih et al. (2024) similarly highlighted the generative AI's function of scaffolding during the writing process enabling students to visualize changes during iterative drafts and monitor their progress across multiple drafts — both of which contribute to writing confidence over time. All these studies together validate that using generative AI technologies in postgraduate thesis writing support systems add pedagogical value. It improves the document's academical procedural quality but more crucially builds a constructive atmosphere that enables greater confidence in students throughout their thesis writing journey.

H2: Generative-AI in Thesis Writing significantly enhance writing Confidence

2.3 Research Quality and Writing Confidence

Writing confidence - the belief in one's ability to conduct, document and present research in a clear, comprehensive, and academically acceptable format - is one of the vital aspects influencing success during postgraduate studies. There exists considerable research support that indicates a positive correlation between the confidence of student researchers, particularly postgraduates, and the quality of research outcomes they produce. Optimal academic output reflects not only technical proficiency, but also enhances one's estimation of their academic ability which in turn increases confidence and performance in writing (Maphoto et al., 2024). In the view of Subih et al., (2025), postgraduate students who balance strong theoretical frameworks with clear methods and overall integration in their research tend to have heightened self-efficacy alongside greater confidence in academic writing. This is in accordance with Tiandem-Adamou (2024) who argues that students who are positively assessed by their peers and have constructive feedback on their thesis drafts tend to have better confidence concerning academic writing expectations in future tasks. Ringo (2025) noted that the quality of research increases with greater sharpness in the argument presented, citation precision, and analytical reasoning which enhances academic mastery and subsequently student confidence in scholarly writing. In a longitudinal study, Li et al. (2025) noted that master's students' literature reviews and conceptual frameworks underwent improvements, which positively affected their confidence in writing during high stakes activities like journal submissions and thesis chapters. In the same vein, Illma & Sampurna (2024) observed that affirmation from supervisors and peers fostered self-esteem among students with logically cohesive theories and well-structured theses. El Gareh et al. (2025) claim that the iterative nature of thesis development in conjunction with quality enhancement milestones, such as improvement in argumentation or alignment between objectives and outcomes, serves as a confidence booster for postgraduate learners. These findings were further developed by Hussain (2023) who states that students assessing their research as of high quality – measured by acceptance in academic forums, praise by supervisors, and internal assessments – helps in forming a scholarly identity, which enhances their confidence to engage in wider academic discourse through writing. All these

studies imply that addressing the quality of research done by postgraduate students offers more than just an evaluative step, but rather serves as a psychosocial support which aids to strengthen the students' perception of their writing competencies. Therefore, to assume the existence of a positive correlation between the quality of research and the confidence related to writing is valid both theoretically and empirically.

H3: Research Quality significantly enhance writing Confidence.

2.4 The Mediating Role of Writing Confidence

The mediating role of writing confidence with regards to AI-assisted academic writing is garnering more focus in recent research. Generative AI applications, like ChatGPT, Grammarly, and QuillBot, not only enhance structural precision, sophistication of argumentation, and content pertinence, but also have other effects. Rather, these tools tend to act as precipitating factors of psychological outcomes, particularly through boosting students' writing confidence, which subsequently enhances the quality of research work. Hussain et al. (2022) and EI Gareh et al. (2025) noted postgraduate students using AI-enabled writing resources reported having greater confidence in articulating, structuring, and customizing academic documents using appropriate disciplinary conventions. This change in writing confidence bridged the psychology gap, facilitating students to craft better, more logical, and more original theses, as cited by Hussain (2023). Khan et al. (2024) similarly observed that generative AI tools remove anxiety and self-doubt associated with writing. This aids students' motivation to apply advanced reasoning and iterative writing processes which characterize high-quality research. As Hysaj et al. (2025) and George (2023) emphasized, AI tools reduce cognitive overload, allowing students to receive instantaneous feedback which assists in skill acquisition and confidence building, such as during the initial stages of task performance. Such confidence gains subsequently improve students' abilities to form clear hypotheses, synthesize literature, and defend appropriate methodologies, which are all indicative of high-quality academic research (as cited in Rowland, 2023). To this end, Khan et al. (2023) showed that students who reported greater confidence in their writing with AI-assisted learning environments also performed more complex scholarly tasks like thematic synthesis or theoretical framework construction, resulting in higher-quality work. Moreover, Ringo (2025) illustrated that AI tools enhance the quality of research indirectly by improving the mindset around self-efficacy, self-improvement, and iteration in written work. Perceived self-efficacy regarding competency as a writer motivates proactive behavior, such as revising drafts and obtaining supervisor feedback, which enhances academic compliance and standards—directly improving the quality of research (Maphoto et al., 2024). Thus, the interplay between portable AI technologies and quality-enhanced research seems to suggest that the confidence these tools instill in students' writing skills acts as a mediating factor for research quality. In other words, while AI technologies have been efficient aids, their real value lies in psychological empowerment (Tiandem-Adamou, 2024). This mechanism is consistent with other learning frameworks like self-efficacy and social cognitive ones that emphasize the impact of confidence on performance outcomes for tasks. Considering the emerging results from these seven different studies, it seems reasonable to assume that, with careful consideration and supporting evidence, writing confidence functions as a mediating variable between the use of AI in thesis writing at the postgraduate level and the quality of research produced.

H4: Writing confidence mediates the relationship between generative AI in thesis writing support and the research quality of postgraduate students.

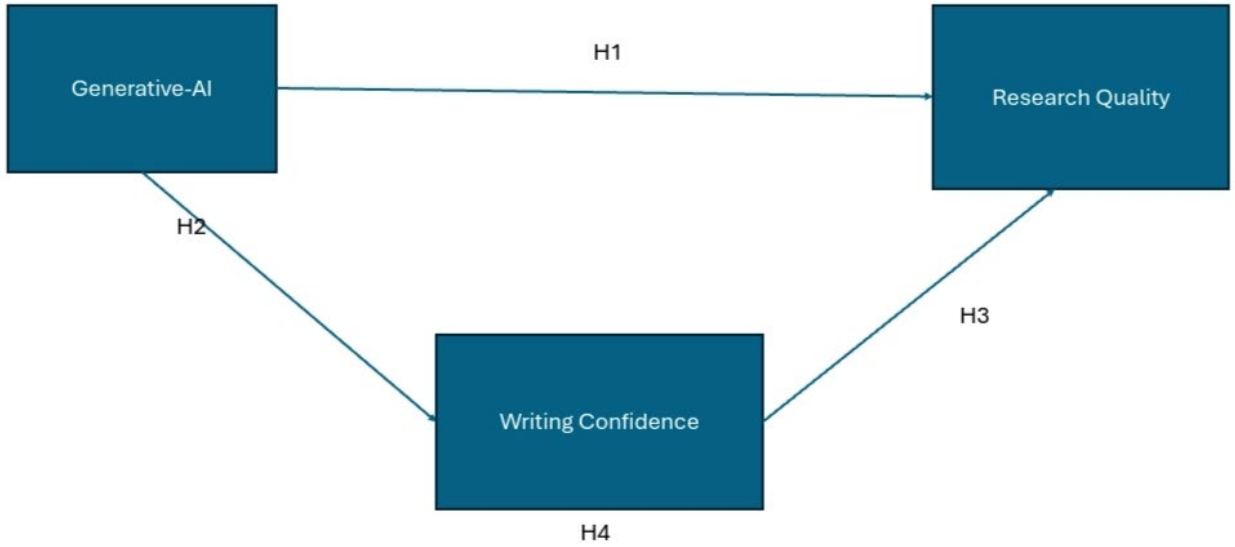

Figure 1. Conceptual Framework

3. Materials and Methods

3.1 Research Samples

The subjects that were selected for this specific research study included postgraduate students studying in master's and doctoral programs at both public and private universities located in the major academic regions in Pakistan. In this study we use random sampling technique for data collection. We distributed 250 questionnaires and received 231 valid responses constituting an effective response rate of 92.4%. The sample comprised students from various disciplines including business, education, social sciences, and engineering. To achieve geographic diversity, universities from the Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan provinces were included with major city representation from Lahore, Karachi, Islamabad, Peshawar, and Quetta. This wide ranging sampling ensures that the results have adequate generalizability and that the study is in fact well balanced.

3.2. Study Materials

This research examines three primary components: Generative AI-assisted thesis writing, Writing Confidence, and Research Quality. All constructs were assessed with validated instruments adapted from previous studies which ensured reliability and alignment with existing literature. In order to maintain meaning and culture, the scales were first vetted by three PhD holders in educational technology and academic writing. Changes were made that would better fit the Pakistani postgraduate context. Afterwards, two senior faculty members who were proficient in English and Urdu did a translational reverse, and in their debates over the discrepancies they were able to reach agreement as an expert panel. All items in the questionnaire were rated on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The measurement of AI assistance applied a ten-item scale based on (Saleh et al., 2025; Din et al., 2024), including "AI tools help me generate thesis content more efficiently" and "Generative AI improves the clarity of my academic writing." Writing Confidence was measured using an 8-item scale developed by (Alzaareer et al., 2024; Abdulghani et al., 2025) which included "I am confident in structuring academic arguments" and "I can write research content with minimal guidance when aided by AI." Research Quality was measured with a seven-item scale based on (Alsaraireh et al., 2025; Illma & Sampurna, 2024) that included, "My thesis reflects a high level of academic

rigor," and "My research is well-structured and logically organized." Control variables included gender, age, academic discipline, and study level (master's or doctoral), as well as their familiarity with AI tools. For these variables, information was gathered using ordinal or nominal scales as relevant, and tested for control in regression analysis.

3.3. Data Analyses

Analyses was performed through SPSS, an education and social science survey research software, employing Version 23.0. The analytical framework incorporated exploratory factor analysis (EFA) to confirm the factor structure of the scales, assessed reliability using Cronbach's alpha, and examined relationships among variables using Pearson correlation analysis. Moreover, mediation effect tests were performed with 5000 bootstrap samples to evaluate the mediating role of confidence in writing between the use of generative AI and perceived quality of research. Multicollinearity diagnostics were checked by Variance Inflation Factors (VIF) values to ensure no collinearity concerns existed. The threshold for statistical significance was set at $p < 0.05$.

4. Results

This section summarizes the results of the current study employing descriptive statistics, common method bias tests, and preparatory analysis steps for mediation analysis. Results are presented under distinct subheadings for improved comprehension and accuracy.

4.1. Sample Descriptive Analysis

Out of the total responses, 231 were valid for analysis, which were collected from postgraduate students studying at different universities in Pakistan. Out of these, 138 were males while 93 were females, resulting in a gender distribution ratio of approximately 3:2. They are slightly skewed towards male which is common with admission trends into postgraduate programs in Pakistan. As for the age distribution, 157 participants (68%) were aged between 22-30 years which indicates that most respondents were at the beginning of their postgraduate academic journey. Concerning the level of study undertaken, it appears that a majority of the respondents were master's students (173 or 74.9%) while 58 (25.1%) were in candidacy for doctoral programs. Regarding their areas of specialization, 96 students (41.6%) were in business and management followed by education with 54 (23.4%), social science with 45 (19.5%) and finally engineering and technology with 36 (15.6%). Such distribution is useful in understanding the diversity of respondents on different academic fronts. With respect to AI exposure and usage, it was found that 169 students (73.2%) had moderate to high levels of AI exposure and familiarity with generative AI tools like ChatGPT, GrammarlyGO, or Quillbot for thesis work. On the other hand, a quarter of the respondents, 62 students (26.8%), reported low to no use which indicates varying degrees of AI usage across students when it comes to academic writing. This diversity captures attention at all levels of experience and adds to the credibility and accuracy of the findings.

4.2 Common Method Bias

Because the participants used self-administered online questionnaires, common method bias (CMB), was evaluated through Harman's single-factor test. All survey items underwent exploratory factor analysis (EFA) using SPSS 23.0, which sought to determine how much a single factor could explain the EFA-derived factor's variance. The first unrotated factor was shown to capture 31.482% of the total variance. This reveals that common method bias is not a significant concern for this study and that the variance is sufficiently distributed among multiple constructs, thus supporting the validity of the data.

4.3. Reliability and Validity Test

The assessment for reliability and validity was performed in SPSS 23.0 and SPSSAU, which ensured that the measurement scales for this study were reliable and statistically valid. The results are presented in Table 1. The generative AI support scale received a Cronbach's alpha of 0.947 which demonstrates strong internal consistency. The KMO value was 0.901 with a p significance of lower than or equal to 0.001 which confirmed sampling adequacy

for factor analysis. The Average Variance Extracted (AVE) was 0.618 and Composite Reliability (CR) 0.926, indicating strong composite validity and reliability. Writing confidence was also measured with a Cronbach's alpha of 0.936, supporting high internal consistency. The KMO value was 0.873 ($p < 0.001$) indicating that the data is fit for further analysis. The AVE was 0.601 and CR 0.884, supporting satisfactory validity and reliability for the construct. Research quality was measured with a Cronbach's alpha of 0.922, indicating sound reliability. The KMO measure of 0.816($p<0.001$) was indicative of acceptable sample adequacy. The scales AVE of 0.645 and CR 0.902 displayed solid convergent validity and internal consistency. These findings validate that the scales for Generative AI Support, Writing Confidence, and Research Quality have strong psychometric properties. The high values of Cronbach's alpha confirm consistency and the KMO, AVE, and CR values, although acceptable, suggest the scales are reliable and appropriate for advanced modeling and mediation analysis.

Table 1. Reliability and validity tests

Variables	Cronbach's alpha	KMO	AVE	CR
Generative-AI Support	0.947	0.901***	0.618	0.926
Writing Confidence	0.936	0.873***	0.601	0.884
Research Quality	0.922	0.816***	0.645	0.902

Note: *p < 0.001*

4.4 Construct Validity and Correlation Analysis

In this study, the measurement items were taken from existing empirical literature that highly validated and trusted scales, thus guaranteeing substantiative content validity. Construct validity was evaluated through an exploratory factor analysis (EFA). The KMO values for all constructs were above 0.700, and Bartlett's Test of Sphericity was statistically significant ($p < 0.001$), suggesting that the data was appropriate for factor analysis. The extraction method was based on Principal Component Analysis (PCA), and the common factors obtained for each construct were in line with the theoretical framework. To improve factor loadings, varimax rotation with Kaiser normalization was used. All item s resulted in factor loadings of over 0.5 on their intended constructs and under 0.4 on non-target constructs which aligned better with the constructs, thus supporting the position that no items needed removal. These results confirmed that all items functioned as intended under the model. Confirmatory Factor Analysis (CFA) supported the measurement model validation. The AVE values for all constructs were between 0.601 and 0.645, which is above the threshold of 0.50, thus demonstrating adequate convergent validity. In the same manner, the values of Composite Reliability (CR) verified that internal consistency was in excess of 0.70 at 0.884 to 0.926 which is deemed acceptable. In terms of discriminant validity, the dichotomous inter-construct correlation coefficients were lower than the square root of the AVE for each construct. This demonstrates that the theoretical independence of Generative AI Support, Writing Confidence, and Research Quality is empirically validated.

Table 2. Correlation Analysis

Variables	Generative-AI Support	Writing Confidence	Research Quality
Generative-AI Support	**(0.786)**		
Writing Confidence	**0.417*** **	**(0.775)**	
Research Quality	**0.292*** **	**0.531*** **	**(0.803)**

Note: *p < 0.05; **p < 0.01; ***p < 0.001. The diagonal values in parentheses represent the square roots of the AVE. Off-diagonal values indicate correlation coefficients between constructs.

4.5. Variables Descriptive Statistical Analysis

As the results of the analysis demonstrate in Table 3, means of the obtained values from the primary research variables fell between 3.109 and 3.622, while the calculated standard deviations ranged from 0.511 to 0.849. It can be observed that there are some moderate levels of perceptions together with variability among respondents on Generative AI Support, Writing Confidence and Research Quality. Considered together with the correlation data presented in Table 2, there were strong positive correlations between all constructs parts, particularly with Writing Confidence and Research Quality. These correlations, significant from a statistical point of view, have value as they statistically corroborate the proposed model, indicating that the constructs have meaningful relationships thereby making them suitable for more detailed investigation by way of hypothesis testing.

Table 3. Descriptive Statistical Analysis

Variables	Mean	Standard Deviation
Writing Confidence	**3.387**	**0.627**
Research Quality	**3.622**	**0.849**

4.6. Hypotheses Testing

In order to test the anticipated relationships between the constructs of the study, all constructs were mean-centered before analysis in order to reduce the likely multicollinearity effects. A stepwise regression analysis was performed using SPSS 23.0. Control variables, gender, academic discipline, and research experience, were entered into the regression model in the first step. Then, the independent and mediating variables, Generative AI Support and Writing Confidence, were entered to determine their individual impacts on the dependent variable, Research Quality. This specific order of regression enables proving every variable's contribution to explaining the outcome after controlling for more qualitative factors and provides thorough empirical validation of the thesis about the study's hypotheses. The results of the analysis are provided in the following section.

4.7 Main Effects and Mediation Analysis

As for this analysis, Writing Confidence was treated as the dependent variable for model 1 and model 2 was constructed with Generative AI Support and Research Productivity as independent variables. Writing Confidence and Research Productivity were also treated as dependent and independent variables respectively to form model 3. All regression model results are provided in Table 4. All models were adjusted with age and research experience as demographic controls. The independent variables in all models had positive coefficients which were significant at the alpha .05 level. Furthermore, with all models VIF values under 2.5 showed no multicollinearity issues. This strongly contributes to supporting H1, H2, and H3. To model mediation effect, Generative AI Support was set as independent only without modulating Writing Confidence. Control variables were the same as above. Confidence intervals were conditioned at 5 percent so overall 5000 repetitions were executed using Bootstrap method to check the mediating effect. The findings indicated that the research productivity mediator had a regression coefficient of $\beta = 0.945$ ($p < 0.001$) and the 95% Bootstrap confidence interval did not include zero. VIF also still under 2 showed no multicollinearity problems. Mediation effect measured was significant. After adding Research Productivity as a mediator, the regression coefficient of Generative AI Support on Writing Confidence decreased from 0.487 to 0.182. The Bootstrap 95% confidence interval including zero indicates a full mediation effect. Thus, H4 was supported. The total effect of Generative AI Support on Writing Confidence was 0.487, the direct effect on Writing Confidence was 0.182, and the indirect mediation effect was through Research Productivity: 0.263 (0.278/0.945) which is approximately 1.4 times the direct effect (0.263/0.182).

Table 4. Results of Main Effects and Mediation Effects Testing

Model (Dependent Variable)	Model 1 (Research Quality)	Model 2 (Research Quality)	Model 3 (Research Quality)
Generative-AI Support	**B=0.487*** **		**B=0.182***
	T=1.725		**T=2.38**
	[0.322, 0.648]		**[-0.012, 0.357]**
		β = 1.014* **	**β = 0.945*** **
Writing Confidence	**-**	**t = 14.521**	**t = 11.234**
		[0.872, 1.157]	**[0.758, 1.128]**
R^2	**0.248**	**0.469**	**0.498**
ΔR^2	**0.142*** **	**0.376*** **	**0.384*** **
F	**10.124*** **	**27.652*** **	**25.783*** **

5. Discussion

The results obtained in this study provide stronger empirical evidence regarding the positive relationships between the support of generative AI, confidence in writing, and quality of research. In alignment with our hypotheses, it was found that generative AI support significantly bolstered writing confidence, and subsequently, this boosted the quality of research. Moreover, writing confidence was found to have completely mediated the relationship between generative AI support and research quality, emphasizing the importance of psychosocial factors, in this case, AI dependent tools' impact on scholarly productivity, through which such tools influence academic outcomes. These findings are in line with an increasing trend in the available literature underscoring the positive impact of AI-powered technologies on academic performance. For example, Saleh et al. (2025) and Dreidi et al. (2024) indicated that AI-enabled writing tutors greatly enhance the users' self-efficacy, thereby increasing the users' academic writing standards. In the same vein, Din et al. (2024) demonstrated that AI aid improves the cognitive and motivational components of writing, positively affecting research task outcomes. Our results also support the findings of Alsaraireh et al. (2025), who confirmed that confidence in writing within technology-enhanced learning environments is a critical mediating factor. The notable positive impact of generative AI on writing confidence also supports the arguments of numerous preceding studies (Abdulghani et al., 2025) that have documented the tendency of AI to alleviate the anxiety and cognitive burden associated with academic writing, engagement, and fostered confidence in the writing processes. In addition, the cited impact of writing confidence on the quality of research documents the effects of Li et Al., (2025) who argued that self-efficacy boosts critical thinking and coherence within written arguments. Also, the total mediation effect found in this study contributes to the literature developed by Hysaj et al., (2025) and EI Gareh et al., (2025) who argued that psychological variables such as confidence fully mediate the relationship between technological aid and performance outcomes. This mediation, in particular, paints the picture of AI tools in the active self-directed learning paradigm as relying on internal cognitive and emotional mechanisms that need to be mobilized in order to gain from the tools' functionalities. Further support stems from Hussain (2023) and George (2023) who, in their recent large-scale studies, showed the application of AI writing aids into the research workflow enhances the overall quality of the research, but only when the user's perception of their writing skills is high. In the same way, Khan et al. (2023) reported AI interventions facilitated more coherent and analytical outputs by strengthening their self-efficacy as writers. Cumulatively, these findings from this study add to the powerful narrative within the literature that generative AI tools, by enhancing writing confidence, fundamentally diminish the quality of research. This highlights the impact of AI on academic environments, providing deeper understanding of

the role of technology-induced self-efficacy on academic output and its caliber. AI technology is becoming more embedded into all spheres of life. In light of this phenomenon, the purpose of this paper is to investigate the extent of impacts that AI generative technologies such as OpenAI's ChatGPT have on academic performance and research activities of students at the University of Professional Studies through focused group interviews. Adding such concerns into the overly debated issues regarding the impact of technological change on educational systems was instrumental.

5.1 Theoretical Implications

Theories were convincing enough to understand that technological determinism has built merit alongside its critiques for building walls about AI redefining work structures needed the author's urgent attention. The level of transforming influences from AI powered chatbots and other generative tools on students has been unprecedented which goes inline with what framed the project objectives. Evaluation methods made it clear that generative AI has impacts on student academic performance. This theme covers only part of the transformational potential of new AI technologies on education. Interaction of machine learning and new AI tools with several other dimensions can transform available academic frameworks into new ones which in line with phenomena based the goal of the research.

5.2 Practical Implications

Educational practitioners, AI business owners, and generative AI focus researchers stand to benefit from the findings AI has shown to greatly improve a user's sense of writing confidence. It would be appropriate for training procedures and design interfaces, which impacts the user's sense of competence/efficacy and anxiety, to be concentrated on features that strive to increase user competence. School systems can adopt these findings towards effective integration of AI writing assistants in lesson instruction as they embrace the stance of promoting autonomy and confidence among learners. Practitioners and researchers in educational institutions must also understand the impact of writing confidence on the quality of research already conducted and shift claiming focus to psychological readiness framing alongside technological skills, thereby underscoring the value of effective primary and supportive mechanisms. Workshops, tutorials, and other supportive strategies pin pointed to confidence can help achieve higher quality scholarly work stemming from AI. Additionally, AI developers are encouraged to improve technical AI support systems by also adding some primary aspects that aim at enhancing the clients' confidence, such as real-time feedback, monitoring systems, and personalized messages of encouragement aimed at users. Such design oriented towards the end-users' needs will translate into greater trust and higher satisfaction in using these research tools thereby improving the efficiency of research work. To conclude, the implications of the study in both theory and practice recommend a balanced perspective that encompasses the use of AI as it relates to cognitive, emotional, and technological factors towards improving academic writing and research.

5.3 Limitations and Future Research Directions

This study certainly provided valuable insights; however, a few notable limitations exist that also serve as opportunities for future research. First, due to the correlational cross-sectional design, no causal relationships can be inferred in generative AI support, research writing confidence, and Research quality. It would be beneficial for longitudinal studies to investigate these relationships over time, as well as the impacts of AI assistance on writing at various stages of learning development. Second, the sample drawn from this specific academic population may limit the findings' generalizability to other levels of education and cultural contexts. It would be helpful for future studies to conduct this research in other countries and disciplines to improve external validity and explore contextual differences in AI use and its psychological effects. Third, the focus on writing confidence as a mediating variable may have led this study to neglect other psychological or behavioral aspects that AI support could affect and consequently change research outcomes. Other studies may wish to add endurance, cognitive load, or user experience as mediating or moderating factors to explain AI's influence on academic writing and create a refined model. Fourth, the study made use of self-reported measures, which are susceptible to biases such as social politeness or personal biases. Incorporating behavioral metrics, objective performance measures, or even qualitative techniques could supplement and enhance future understanding. Having noted that, the fast-paced development of generative AI technologies suggests that tools as well as user interfaces undergo considerable changes within brief durations. Longitudinal studies monitoring these developments, alongside feature assessments and the impacts of academic writing and research productivity over time, require consistent attention. Generating these considerations will not

only provide value in dominating gaps within existing literature, but also aid in understanding the great extent of generative AI's influence on education and research.

6. Conclusion

This study has shown that the supportive role of generative AI in aiding researchers' confidence boosts writing confidence and, thus, positively impacts the quality of academic work produced. The AI support tools validated in the study underscore the importance of AI tools as enablers of writing productivity by alleviating difficulties associated with academic writing. Filling gaps left by traditional approaches to AI in writing documents emphasizes the need for psychological research as far as AI technologies are concerned. This study was aimed at finding the links but, at the same time, adjusts the perception of scholarship concerning AI technologies in writing. The findings of this study have established that the use of generative AI in research work enhances scholarly productivity by simplifying the writing work involved and improving the quality of academic work place.

Ethical Approval statement:

We, the undersigned researchers, hereby confirm that this study titled has been designed and will be conducted in accordance with the ethical principles outlined by Shaheed Benazir Bhutto University, Nawabshah, Pakistan and relevant national and international guidelines, including the Declaration of Helsinki.

Conflict of Interest: There is no any conflict of interest.

7. References

Alghizzawi, M., Hussain, Z., Abualfalayeh, G., Abu-AlSondos, I. A., Alqsass, M., & Chehaimi, E. M. (2025). The Impact of AI-driven Strategy on Salespeople Training and Performance. *International Review of Management and Marketing, 15(2), 1-11.*

Almagharbeh, W. T. (2025). The impact of AI-based decision support systems on nursing workflows in critical care units. *International nursing review, 72(2), e13011.*

Al-Akash, H., Aldarawsheh, A., Elshatarat, R., Sawalha, M., Saifan, A., Al-Nsair, N., … & Eltayeb, M. (2024). “We do others’ Jobs”: a qualitative study of non-nursing task challenges and proposed solutions. *BMC nursing, 23(1), 478.*

Almagharbeh, W. T., Alfanash, H. A., Alnawafleh, K. A., Alasmari, A. A., Alsaraireh, F. A., Dreidi, M. M., & Nashwan, A. J. (2025). Application of artificial intelligence in nursing practice: a qualitative study of Jordanian nurses’ perspectives. *BMC nursing, 24(1), 92.*

Aldarawsheh, A. A., Saifan, A. R., Sawalha, M. A., Assaf, E. A., Alrimawi, I., Elshatarat, R. A., … & Eltayeb, M. M. (2024). Exploring the causes and consequences of non-nursing tasks among nurses in Jordan: An in-depth qualitative investigation. *Applied Nursing Research, 77, 151791.*

Alsharawneh, A., Sawalha, M., Tabar, N. A., Elshatarat, R. A., Almarwani, A. M., Saleh, Z. T., … & Eltayeb, M. M. (2024). Impact of triage nurses’ recognition of acute coronary syndrome on patients’ clinical outcomes: A retrospective study. *Heart & Lung, 68, 60-67.*

Ashour, A. M., Masa’deh, R., Hamaideh, S. H., Elshatarat, R. A., Yacoub, M. I., Almagharbeh, W. T., … & Eltayeb, M. M. (2024). Examining the influence of anxiety and depression on medication adherence among patients diagnosed with acute myocardial infarction. *BMC psychology, 12(1), 473.*

Agbonselohbor, B., Aslanoğlu, A., Bilgiç, N., Alsharawneh, A., Elshatarat, R. A., Saleh, Z. T., … & Eltayeb, M. M. (2025). Associated factors of Nigerian Nurses' Emotion regulation, perceived stress, and coping mechanism during COVID-19 Pandamic: a cross-sectional study. *African Health Sciences, 25(1), 84-110.*

Alzaareer, M., Aslanoğlu, A., Elshatarat, R. A., Almagharbeh, W. T., Saleh, A. A., Al-Akash, H. Y., … & Ismail, N. (2024). Opportunistic Bacterial Infections and Control Measures in Saudi Arabian Healthcare Facilities: A Literature Review. *Research Journal of Pharmacy and Technology, 17(7), 3521-3526.*

Abdulghani, M. F., Barzegari, R., Almagharbeh, W. T., Yazdani, Z., Amandadi Ghotbabadi, A., Seyed Bagheri, S. H., … & Dehghan, M. (2025). Treatments of psychosomatic symptoms in Alzheimer's disease: a scoping review of the potential therapeutic effects of essential oils. *Psychogeriatrics, 25(2), e70007.*

Alsaraireh, M., Al-Kalaldeh, M., Alnawafleh, K., Dwairej, D. A., & Almagharbeh, W. (2025). Associated Factors Influencing Quality of Life and Knowledge Among Type 2 Diabetic Patients: A Cross-Sectional Study. *Current Diabetes Reviews, 21(2), E090224226838.*

Bandura, A. (1986). Social foundations of thought and action. *Englewood Cliffs, NJ, 1986(23-28), 2.*

Bandura, A. (1999). Social cognitive theory: An agentic perspective. *Asian journal of social psychology, 2(1), 21-41.*

Chanpradit, T. (2025). Generative artificial intelligence in academic writing in higher education: A systematic review. *Edelweiss Applied Science and Technology, 9(4), 889-906.*

Chan, S., Lo, N., & Wong, A. (2025). Leveraging generative AI for enhancing university-level English writing: comparative insights on automated feedback and student engagement. *Cogent Education, 12(1), 2440182.*

Cheng, Y., Lyons, K., Chen, G., Gašević, D., & Swiecki, Z. (2024, March). Evidence-centered assessment for writing with generative AI. In *Proceedings of the 14th Learning Analytics and Knowledge Conference (pp. 178-188).*

Din, A. L., Qamar, N., Abaid, T., Akhter, N., Alfanash, H. A., & Almagharbeh, W. T. (2024). Daily Management Insights: A Social Phenomenological Study Of Head Nurses. *Frontiers in Health Informatics, 13(4).*

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly, 319-340.*

Dreidi, M., Abed, D., Salameh, H., Sbeih, I. A., Asmar, S., Salameh, S., … & Almagharbeh, W. T. (2024). The effect of self-esteem on stress and coping mechanisms among nursing students during clinical training in Palestinian universities. *International Journal of Practice-based Learning in Health and Social Care, 12(1), 59-69.*

El Gareh, F., Elmenssouri, A., Oulamine, A., & Hussain, Z. (2025). A PRISMA-Based Systematic Review on Organizational Commitment and Logistic Performance. *Knowledge Sharing and Fostering Collaborative Business Culture, 213-240.*

George, A. S. (2023). The potential of generative AI to reform graduate education. *Partners Universal International Research Journal, 2(4), 36-50.*

Hussain, Z. (2023, April). Analyzing the Emerging Trends of Digital Literacy Among Muslim Students Zahid Hussain. In *The 1st Annual Conference of Islamic Education (pp. 125-134). Atlantis Press.*

Hysaj, A., Dean, B. A., & Freeman, M. (2025). Exploring the purposes and uses of generative artificial intelligence tools in academic writing for multicultural students. *Higher Education Research & Development, 1-15.*

Hussain, Z., Khan, A., & Ali, A. (2023). The impact of user-generated content, social interactions and virtual economies on metaverse environments. *Journal of Sustainable Economics, 1(2), 34-44.*

Ironsi, C. S., & Solomon Ironsi, S. (2025). Experimental evidence for the efficacy of generative AI in improving students' writing skills. *Quality assurance in education, 33(2), 237-252.*

Ilma, A., & Sampurna, R. A. (2024). Exploring the Impact of Language Models on Undergraduate Thesis Writing Skills among Higher Education Students. *Peradaban Journal of Interdisciplinary Educational Research, 2(1), 1-21.*

Khan, A., Hamid, A. B. A., Saad, N. M., Hussain, Z., & Arif, A. R. (2023). Effectiveness of artificial intelligence in building customer loyalty: investigating the mediating role of chatbot in the tourism sector of Pakistan. *International Journal of Academic Research in Business and Social Sciences, 13(9), 657-671.*

Khan, A., Hussain, Z., Majeed, M. U., & Padhi, A. (2024). Analyzing the Effectiveness of Influencer Campaigns in Driving Customer Acquisition and Retention: Perspectives from Unilever Pakistan. In *Advances in Data Analytics for Influencer Marketing: An Interdisciplinary Approach (pp. 241-256). Cham: Springer Nature Switzerland.*

Kim, J., Yu, S., Detrick, R., & Li, N. (2025). Exploring students' perspectives on generative AI-assisted academic writing. *Education and Information Technologies, 30(1), 1265-1300.*

Li, Z., Liang, C., Peng, J., & Yin, M. (2024, May). The value, benefits, and concerns of generative ai-powered assistance in writing. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (pp. 1-25).*

Lee, H. P., Sarkar, A., Tankelevitch, L., Drosos, I., Rintel, S., Banks, R., & Wilson, N. (2025, April). The impact of generative AI on critical thinking: Self-reported reductions in cognitive effort and confidence effects from a survey of knowledge workers. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (pp. 1-22).*

Maphoto, K. B., Sevnarayan, K., Mohale, N. E., Suliman, Z., Ntsopi, T. J., & Mokoena, D. (2024). Advancing students' academic excellence in distance education: Exploring the potential of generative AI integration to improve academic writing skills. *Open Praxis, 16(2), 142-159.*

Parker, J. L., Becker, K., & Carroca, C. (2023). ChatGPT for automated writing evaluation in scholarly writing instruction. *Journal of Nursing Education, 62(12), 721-727.*

Rowland, D. R. (2023). Two frameworks to guide discussions around levels of acceptable use of generative AI in student academic research and writing. *Journal of Academic Language and Learning, 17(1), T31-T69.*

Ringo, D. S. (2025). The effect of generative AI use on doctoral students' academic research progress: the moderating role of hedonic gratification. *Cogent Education, 12(1), 2475268.*

Subih, M., Rababa, M., Aryan, F. S., Alnaeem, M., AlRahahleh, M. H., Al Niarat, T. F., … & Elshatarat, R. A. (2025). Factors influencing nurses' knowledge and competence in warfarin-drug and nutrient interactions and patient counseling practices. *BMC Medical Education, 25(1), 540.*

Suglo, E. K., Mejira, A., Bayor, N., Nyemewero, I., & Godfred, A. A. (2024). Integrating Generative AI in Contemporary Research Writing: Exploring Postgraduates' Knowledge and Willingness to Use GenAI in the Upper East Region of Ghana. *American Journal of Technology, 3(1), 33-51.*

Saleh, Z. T., Rababa, M., Elshatarat, R. A., Alharbi, M., Alhumaidi, B. N., Al-Za'areer, M. S., … & Fadila, D. E. S. (2025). Exploring faculty perceptions and concerns regarding artificial intelligence Chatbots in nursing education: potential benefits and limitations. *BMC nursing, 24(1), 440.*

Saleh, Z. T., Aslanoglu, A., Al-Dgheim, R., Sawalha, M. A., Elshatarat, R. A., Al-Akash, H. Y., … & Alharbi, M. K. (2024). Effectiveness of Triage Professionals' Knowledge and Experience on Their Ability in Early Diagnosis and Consequent Treatment of Acute Coronary Syndrome: A Literature Review Study. *Research Journal of Pharmacy and Technology, 17(8), 4075-4082.*

Saleh, Z. T., Aslanoğlu, A., Almagharbeh, W. T., Fadila, D. E. S., Nagoor Thangam, M. M., Al-Dgheim, R., … & Ebeid, I. A. (2025). Reducing sedentary behavior improves depressive symptoms among patients with heart failure enrolled in a home-based mobile health app cardiac rehabilitation. *Journal of Nursing Scholarship, 57(3), 394-403.*

Tiandem-Adamou, Y. (2024). Using Generative Artificial Intelligence to Support EFL Students' Writing Proficiency in University in China. *Journal of Educational Technology and Innovation, 6(4).*

Washington, J. (2023). The impact of generative artificial intelligence on writer's self-efficacy: a critical literature review. *Available at SSRN 4538043.*

Yeung, S. (2025). University students' engagement with generative AI-supported automated writing evaluation (AWE) feedback. *Journal of Second Language Writing, 68, 101203.*