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Trust in ChatGPT and Perceived Academic Writing Improvement: A TAM-based Quantitative Study in a ESL Context

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Abstract

This study examines the impact of undergraduate students' trust in ChatGPT on their perceived improvement in academic writing and their intention to utilize the tool in future writing tasks. Grounded in the Technology Acceptance Model (TAM) and the Trust in Technology Framework, the study employs a quantitative approach to examine student perceptions within a Functional English course at a public-sector university in Pakistan. A total of 225 students from the Telecommunication Engineering, Computer Science, and Chemistry departments participated in a structured survey. Descriptive statistics, Pearson's correlation, and multiple regression analysis revealed that trust in ChatGPT significantly correlates with perceived improvements in clarity, vocabulary, and organization. Moreover, overall trust and Acceptance were strong predictors of students' future intent to use ChatGPT. The findings suggest that students' confidence in AI feedback enhances their writing development, underscoring the importance of institutional support and the ethical integration of AI. This study contributes to the growing body of research on generative AI in education by providing localized insights from a non-Western English as a Second Language (ESL) context and recommending pedagogically sound strategies for responsible AI adoption.

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Introduction

Academic writing remains a persistent challenge for ESL learners, especially in organizing ideas, using appropriate vocabulary, and achieving clarity. Tools like ChatGPT offer real-time, adaptive support that can help bridge these gaps. The rapid integration of generative artificial intelligence (AI) tools, such as ChatGPT, into educational settings, marks a transformative shift in how students develop and refine critical academic skills. As a large language model, ChatGPT provides personalized feedback, facilitates brainstorming, and enhances clarity and organization in written work. Writing, recognized as a cornerstone of academic success, remains challenging for students to master. Key obstacles include achieving clarity, organizing ideas effectively, and employing a diverse vocabulary. ChatGPT's ability to act as a virtual writing assistant holds the potential to alleviate these difficulties by guiding students through iterative improvement processes. However, the success of such tools depends not only on their technical capabilities but also on students' trust in their reliability, accuracy, and usefulness. Trust is a key factor influencing how users engage with technology and perceive its utility in achieving academic goals.

In recent years, the adoption of AI tools in education has gained traction globally, with studies highlighting their ability to support personalized learning, foster engagement, and enhance writing outcomes. For example, Su and Yang (2023) emphasized ChatGPT’s capacity to refine clarity and structure, while Zhu and Li (2023) highlighted its role in expanding vocabulary use. However, the success of such tools depends not only on their technical capabilities but also on students' trust in them. Trust—both emotional and cognitive—plays a central role in shaping user engagement, Acceptance, and reliance on AI-generated feedback. As Kim et al. (2023) argue, trust has a significant influence on how learners interact with educational AI tools and whether they perceive them as reliable academic support. Despite growing interest in generative AI, limited research has examined students' trust in tools like ChatGPT, particularly in under-resourced, non-Western university contexts where infrastructure and digital readiness vary widely. Understanding students' trust perceptions is thus essential for ensuring that AI adoption is both practical and ethically aligned with educational goals.

In Pakistan, where English is used as a second language in academic settings, the adoption of AI tools like ChatGPT remains limited. However, a growing interest in educational technology presents a valuable opportunity to explore how generative AI can support academic writing in non-native English-speaking environments. Local challenges—such as limited digital literacy, infrastructural constraints, and cultural perceptions—add complexity to the integration of AI in higher education. Prior studies (e.g., Khan et al., 2021; Ahmad & Ali, 2022) have highlighted the importance of institutional trust and instructor endorsement in encouraging students to utilize educational technologies. However, there is a lack of quantitative research examining how Pakistani university students perceive generative AI tools, such as ChatGPT, particularly in relation to academic writing development. This study addresses that gap by examining how students enrolled in a Functional English course perceive the influence of ChatGPT on their writing improvement. It also examines how trust in ChatGPT influences their willingness to utilize it for future academic tasks. The participants were drawn from three academic departments—Telecommunication Engineering, Computer Science, and Chemistry—representing a range of writing demands and disciplinary perspectives within the Pakistani higher education system. By capturing this diversity, the study

offers insight into how generative AI is perceived across fields and within a resource-constrained, ESL-dominant academic environment.

Guided by the Technology Acceptance Model and the Trust in Technology Framework, the study investigates the following questions:

RQ1: Does students' trust in ChatGPT influence their perceptions of writing improvement, particularly in clarity, confidence, organization, vocabulary, and overall quality?

RQ2: How does students' perception of writing improvement predict their intent to use ChatGPT in future academic writing tasks?

To answer these questions, the study employs a quantitative approach using Pearson's correlation and multiple regression analysis. The results offer localized empirical insights into how trust in AI tools affects student engagement and writing outcomes. Ultimately, the study contributes to the global discourse on AI integration in education by highlighting the importance of ethical design, institutional support, and culturally responsive strategies for the responsible adoption of AI in low-resource ESL contexts.

Literature Review

Generative AI in Education: Global Perspectives

Generative AI tools such as ChatGPT have gained widespread attention for their potential to transform traditional educational practices. By offering real-time feedback, promoting personalized learning, and supporting cognitive skill development, these tools are transforming the way students interact with academic content. Su and Yang (2023), through their "IDEE" framework, outlined the educational benefits of ChatGPT, including enhanced writing clarity, idea generation, and overall learning efficiency. Zhu and Li (2023) further emphasized ChatGPT's strengths through a SWOT analysis, highlighting its ability to process complex tasks and promote diverse vocabulary use while also acknowledging concerns about data quality and bias.

ChatGPT's versatility extends across disciplines—from aiding students in writing and grammar to assisting in more technical domains, such as programming. In computing education, for instance, Zastudil et al. (2023) reported that students appreciated ChatGPT’s role in explaining code and generating logical patterns. Similarly, Rueda et al. (2023) highlighted its use in STEM fields, where AI helped simulate experiments and create adaptive assessments. These studies underline ChatGPT’s broad utility as a cognitive and academic aid, encouraging interdisciplinary exploration of its impact.

Trust in Generative AI: Emotional and Cognitive Dimensions

While the technical capabilities of generative AI are increasingly evident, their success in educational environments depends mainly on how much students trust them. Trust, both cognitive (in the accuracy of the feedback) and emotional (in the comfort of use), shapes students' willingness to engage with AI feedback and recommendations. According to Kim et al. (2023), perceived trustworthiness directly affects student satisfaction and Acceptance of AI-assisted tools. Similarly, Nazaretsky et al. (2022) found that teacher training and transparent

AI practices can strengthen trust in K–12 environments, improving tool adoption.

Amoozadeh et al. (2023) explored the multifaceted nature of student trust in AI, revealing how past experiences, exposure, and peer discussions influence emotional trust. These findings suggest that the relationship between user trust and AI usage is not static but rather evolves with exposure and the quality of feedback. Dunn et al. (2023) echoed this by linking trust in AI with transparency and ethical design, arguing that user engagement increases when tools are perceived as fair and reliable.

Ethical and Practical Considerations

Despite their benefits, generative AI tools have raised ethical concerns, particularly related to over-reliance, misinformation, and academic dishonesty. Students often struggle to verify the accuracy of AI-generated content, which can compromise academic integrity if not properly guided (Ngo, 2023). Halaweh (2023) emphasized the need for structured teacher training and institutional policies to mitigate the misuse of AI. Similarly, Reiss (2021) and Mhlanga (2023) advocated for the responsible use of AI, emphasizing that ethical integration must be accompanied by the development of digital literacy and a balance between AI support and human oversight.

These concerns highlight the importance of designing AI interventions that not only enhance learning outcomes but also uphold ethical standards in educational contexts. Transparency, informed consent, and clear guidelines for the appropriate use of AI must become central to any AI literacy initiative within academic institutions.

Local Insights from Pakistan: Opportunities and Challenges

In the Pakistani educational context, the integration of AI tools remains limited but promising. Khan et al. (2021) demonstrated notable improvements in English language proficiency when students used AI-based tools for writing support. Ahmad and Ali (2022) emphasized that instructor recommendations play a crucial role in increasing student trust and the adoption of AI technologies. Rehman et al. (2023) observed that STEM students viewed ChatGPT as a valuable support tool, but concerns about plagiarism, ethical usage, and tool dependence were prevalent.

These studies confirm that while Pakistani students are open to using generative AI in their academic work, key challenges—such as infrastructure gaps, limited digital literacy, and a lack of clear ethical policies—limit the effective adoption of this technology. This underscores the urgent need for localized research and context-specific strategies that address student needs, institutional readiness, and socio-cultural dynamics.

Identified Gaps in Existing Literature

While the literature provides valuable insights into ChatGPT's educational applications and associated challenges, several critical gaps remain:

1. *Trust in Writing-Specific Outcomes:* While most studies explore general attitudes toward AI, few investigate how trust influences specific writing components, such as clarity, vocabulary, and structure.

2. *Disciplinary Variations:* Research has not sufficiently examined how perceptions of ChatGPT differ across academic fields with distinct writing demands (e.g., humanities vs. engineering).
3. *Predictors of Long-Term Engagement:* There is limited evidence on whether students' trust and perceived usefulness translate into sustained use of AI tools for academic writing.
4. *Localized Insights:* Few quantitative studies have examined the adoption of generative AI in resource-constrained, English as a Second Language (ESL)- heavy settings, such as public universities in Pakistan.

This study addresses these gaps using a quantitative methodology, employing Pearson's correlation and regression analysis to investigate how trust in ChatGPT predicts students' perceived improvements in writing and their intent to continue using the tool in future tasks.

Theoretical Framework

This study is guided by two complementary theoretical models: The Technology Acceptance Model (TAM) (Davis, 1989) and the Trust in Technology Framework (McKnight et al., 2011). Together, these frameworks offer a comprehensive understanding of how students adopt and engage with generative AI tools, such as ChatGPT, in academic writing contexts.

Technology Acceptance Model (TAM)

TAM explains technology adoption based on two primary constructs: Perceived Usefulness (PU)—the belief that using a tool will enhance performance—and Perceived Ease of Use (PEU)—the belief that the tool requires minimal effort to operate. In this study, ChatGPT's features that support clarity, organization, and vocabulary in writing align with perceived usefulness, while its intuitive, text-based interface corresponds to perceived ease of use.

The model further posits that these perceptions influence users' behavioral intention to use the technology. Thus, TAM helps frame how students' beliefs about ChatGPT's usefulness and simplicity shape their willingness to integrate it into future academic writing tasks.

Trust in Technology Framework

While TAM accounts for utility and usability, it does not fully capture the affective and relational dimensions of technology engagement. Therefore, this study also incorporates the Trust in Technology Framework (McKnight et al., 2011), which distinguishes between:

- *Cognitive Trust:* Belief in the tool's accuracy and reliability
- *Emotional Trust:* Comfort and confidence in using the tool

In academic contexts, trust is particularly crucial when students rely on AI for high-stakes tasks, such as essay writing. Initially, students may be skeptical about the ethical implications or reliability of AI-generated content

(Dunn et al., 2023). However, repeated use, guided feedback, and structured assignments can strengthen both cognitive and emotional trust, leading to more confident and critical engagement with AI.

Additionally**,** institutional trust plays a pivotal role. As Ahmad and Ali (2022) highlight, teacher endorsement and university support have a significant influence on students' willingness to adopt educational technologies. In this study, the structured nature of the assignment and the instructor's active role likely contributed to building trust in ChatGPT as an academic tool.

Integrated Theoretical Lens

By combining TAM and the Trust in Technology Framework, this study captures both the functional (usefulness and ease of use) and relational (trust and confidence) aspects of student engagement with ChatGPT. This dual lens is especially relevant in a non-Western ESL context, where technology adoption is shaped not only by practical utility but also by cultural, ethical, and institutional trust factors.

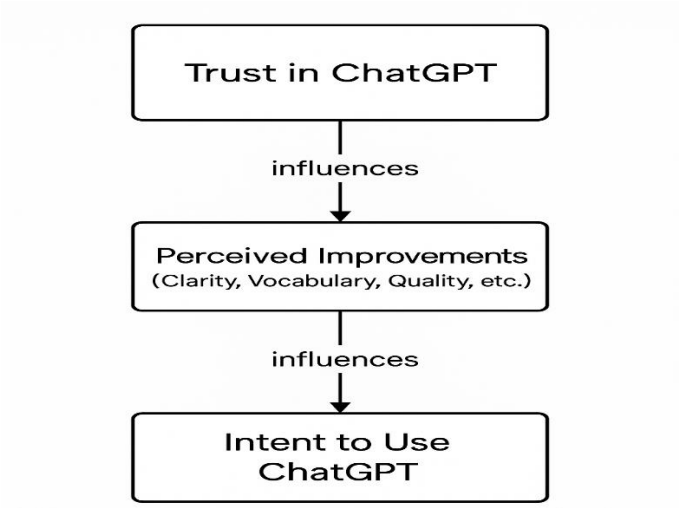

Figure 1. Conceptual Framework

Methodology

Participants

This study included 225 undergraduate students enrolled in a Functional English course at a public-sector university in Karachi, Pakistan. The participants hailed from three academic departments: Telecommunications Engineering, Computer Science, and Chemistry. This diverse representation across disciplines enabled the study to gather various perspectives on the use of ChatGPT in writing tasks.

Survey items measuring perceived usefulness and ease of use align with the Technology Acceptance Model (TAM) constructs. At the same time, trust-related questions align with the cognitive and emotional trust components outlined in the Trust in Technology framework. A self-developed questionnaire was used to collect data on students' perceptions of trust in ChatGPT and its perceived impact on academic writing. The items were designed based on themes identified through a prior qualitative study conducted with the same student cohort,

where open-ended responses revealed key factors influencing trust in AI-assisted learning tools. These themes informed the creation of the quantitative items to ensure contextual relevance. The questionnaire utilized a 5-point Likert scale (Strongly Disagree to Agree Strongly). While the instrument was not adapted from a pre-validated scale, it demonstrated acceptable internal consistency with a Cronbach's alpha of 0.771. This approach allowed for a data-driven and context-sensitive measurement of student perceptions.

Table 1. Demographic Characteristics of Participants

Demographic Variable	Category	Frequency (N)	Percentage (%)
Total Participants	-	225	100%
Gender	Male	120	53.3%
	Female	105	46.7%
Age Group	18-23	225	100%
Department	Telecommunication	75	33.3%
	Computer Science	75	33.3%
	Chemistry	75	33.3%

Sampling

The study utilized a convenience sampling method to recruit participants, which was appropriate given the accessibility of students enrolled in the Functional English course at a public university in Pakistan. Two hundred twenty-five undergraduate students from three academic departments—Telecommunication Engineering, Computer Science, and Chemistry—participated in the research. These departments were selected to ensure a diverse representation of academic disciplines and technological backgrounds, thereby enhancing the understanding of perceptions regarding ChatGPT's role in academic writing.

Participants were included in the study if they were enrolled in the Functional English course during the data collection period, had access to ChatGPT to complete the assigned essay, and submitted their essays and survey responses as required. Convenience sampling was a practical choice, as it facilitated data collection from a specific group directly involved in essay-writing tasks and allowed for the exploration of pertinent research questions.
While convenience sampling enabled efficient recruitment within the available resources, it may limit the generalizability of the findings to other populations or contexts. Future research could mitigate this limitation by employing probabilistic sampling techniques across multiple institutions. Despite this constraint, the sample provided valuable insights into the experiences and perceptions of students actively engaging with ChatGPT in a structured academic environment.

Survey Instrument

The primary data collection tool used in this study was a Student Perception Survey, which assessed students' views on the impact of ChatGPT on their writing skills and their willingness to utilize it for future academic tasks.

Structure

The survey consisted of six items evaluated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), focusing on the following aspects:

- Improvement in writing Clarity.
- Confidence in grammar and sentence structure.
- Ease of organizing ideas and arguments.
- Encouragement to use a broader vocabulary.
- Enhancement of overall essay quality.
- Likelihood of future usage of ChatGPT.

Reliability and Validity

Education and language experts reviewed the survey items to ensure content validity. A pilot test involving 20 students was conducted to refine the instrument and ensure the clarity and appropriateness of the questions. Furthermore, the survey demonstrated high reliability, as indicated by Cronbach's Alpha.

Table 2. Cronbach's Alpha for Survey Variables

Variable	Number of Items	Cronbach's Alpha
Trust in ChatGPT	5	0.89
Clarity (Improved clarity)	4	0.87
Confidence (Improved grammar)	4	0.86
Organization (Ease of ideas)	5	0.88
Vocabulary (Wider vocabulary use)	5	0.85
Quality (Enhanced essay quality)	5	0.90
Future Use (Likely to use again)	4	0.83

Data Collection

The study was conducted as part of a marked assignment for the Functional English course, where students were tasked with composing an essay on the Integration of Technology in Language Classrooms. This process facilitated active engagement with ChatGPT while ensuring transparency in its utilization.

Assignment Design: Feedback Integration: Students engaged with ChatGPT to brainstorm ideas, receive feedback on individual paragraphs, and improve their writing.

Documentation: To foster accountability, students were instructed to include screenshots of ChatGPT's feedback alongside their original drafts and revised versions in their submissions.

Survey Administration: The survey was administered after the assignment to collect students' reflections on the

effectiveness of ChatGPT in enhancing their writing. Participation in the survey was voluntary, and responses were anonymized to encourage honest feedback.

Results

The collected data were analyzed using statistical methods to assess students' perceptions quantitatively.

Descriptive Statistics

Mean (M), standard deviation (SD), and range were calculated for each Likert-scale item to summarize students' overall perceptions of ChatGPT's impact on their writing.

Table 3. Descriptive Statistics

Variable	NO	MM	SDSD	Min	Max
Clarity (Improved clarity of writing)	225	4.02	1.00	1.00	5.00
Confidence (Improved grammar confidence)	225	3.97	0.96	1.00	5.00
Organization (Ease of organizing ideas)	225	4.24	0.85	1.00	5.00
Vocabulary (Encouraged more expansive vocabulary use)	225	4.08	0.98	1.00	5.00
Quality (Enhanced essay quality)	225	4.28	0.90	1.00	5.00
Future Use (Likely to use ChatGPT again)	225	4.18	1.09	1.00	5.00
Overall Acceptance	225	4.15	0.87	1.80	5.00

Students rated the enhancement of essay quality highest (M = 4.28, SD = 0.90), followed by improvements in organization (M = 4.24, SD = 0.85) and vocabulary (M = 4.08, SD = 0.98). The relatively high scores for Clarity (M = 4.02, SD = 1.00) and confidence (M = 3.97, SD = 0.96) reflect the perceived impact of ChatGPT on specific writing skills. Students expressed strong intent for future Use (M = 4.18, SD = 1.09), indicating overall Acceptance (M = 4.15, SD = 0.87) of ChatGPT as a writing aid.

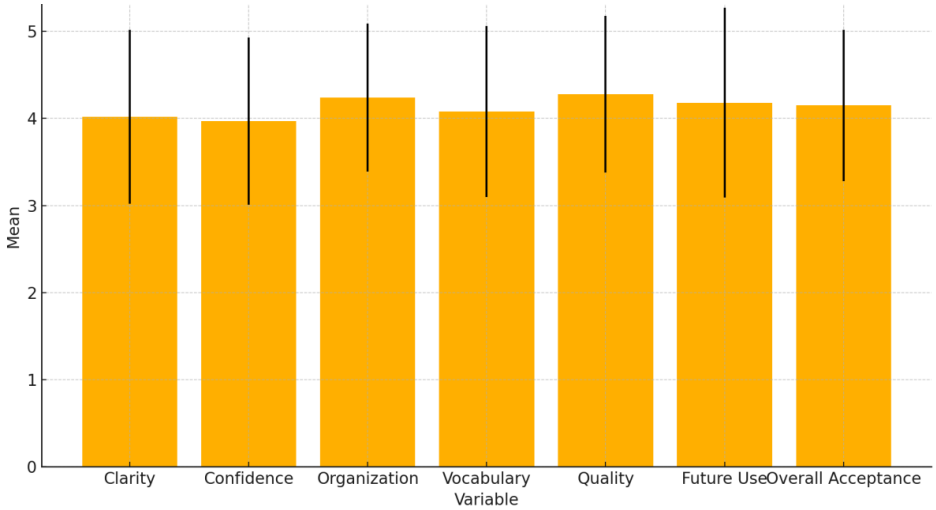

Figure 2. Descriptive Statistics

This bar chart illustrates the mean ratings for Clarity, Confidence, Organization, Vocabulary, Quality, Future Use, and Overall Acceptance. Error bars represent standard deviations, reflecting the variability in participants' responses. Quality was the highest-rated variable, while confidence received the lowest mean score.

Correlation Analysis

Pearson's correlation coefficients were computed to explore the relationships between variables, such as trust in ChatGPT and perceived improvements in writing skills. Table 3 displays the Pearson correlation coefficients, highlighting the relationships between the variables.

Table 4. Correlation Matrix

Variable	Clarity	Confidence	Organization	Vocabulary	Quality	Future Use	Overall Acceptance
Clarity	1.00	0.43	0.42	0.46	0.56	0.53	0.75
Confidence	0.43	1.00	0.50	0.40	0.45	0.42	0.70
Organization	0.42	0.50	1.00	0.44	0.61	0.51	0.75
Vocabulary	0.46	0.40	0.44	1.00	0.55	0.47	0.73
Quality	0.56	0.45	0.61	0.55	1.00	0.60	0.82
Future Use	0.53	0.42	0.51	0.47	0.60	1.00	0.66
Overall Acceptance	0.75	0.70	0.75	0.73	0.82	0.66	1.00

Interpretation

Overall Acceptance correlated strongly with Quality (r = 0.82), clarity (r = 0.75), and Organization (r = 0.75), indicating these dimensions significantly influenced students' Acceptance of ChatGPT. Future use correlated strongly with Quality (r = 0.60) and moderately with clarity (r = 0.53), suggesting students' intent to continue using ChatGPT is driven by its perceived ability to improve writing Quality and Clarity.

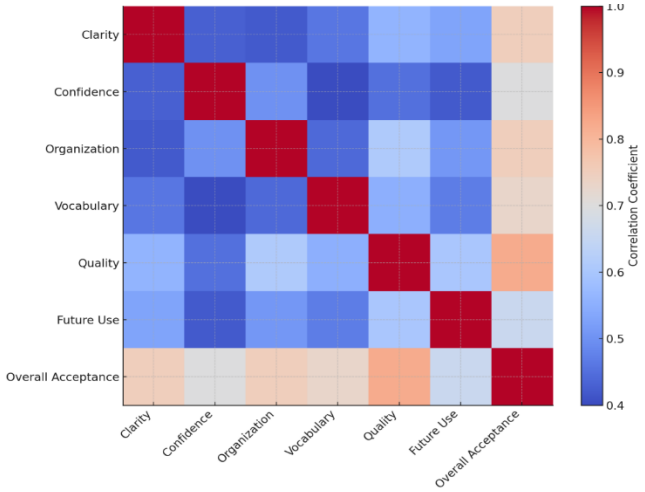

Figure 3. Correlation Heat Map

The heatmap visualizes the Pearson correlation coefficients among the study variables. Strong positive correlations are observed, particularly between Overall Acceptance and Quality (r=0.82r = 0.82r=0.82) and clarity (r=0.75r = 0.75r=0.75). This heatmap highlights the interconnectedness of user perceptions regarding ChatGPT's features.

Regression Analysis

Multiple regression analysis was conducted to predict students' intentions to use ChatGPT in the future based on their overall Acceptance of the tool. Table 5 presents the regression analysis predicting students' intent to use ChatGPT for future tasks based on their overall Acceptance of the tool.

Table 5. Results of Regression Analysis

Predictor	BB	SE	t	p	95% CI (Lower)	95% CI (Upper)
Intercept	-0.661	0.258	-2.559	.011	-1.170	-0.152
Overall Acceptance	1.173	0.062	19.041	<.001	1.052	1.295

Interpretation

Acceptance was a significant predictor of students' future intent to use ChatGPT (B = 1.173, p < .001). A one-unit increase in overall Acceptance was associated with a 1.173-unit increase in intent for future use, indicating a strong positive relationship between these variables.

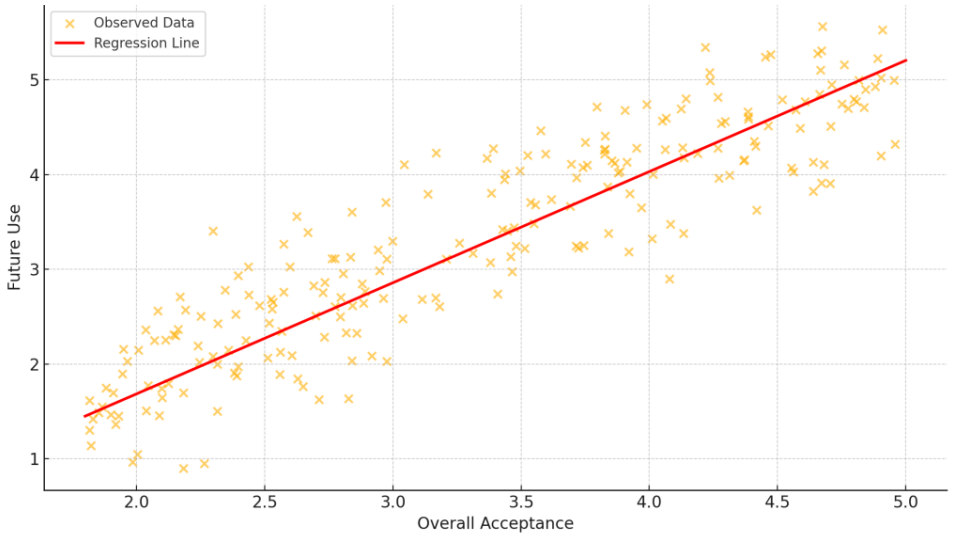

Figure 4. Regression Analysis

The scatter plot demonstrates the relationship between Overall Acceptance (X-axis) and Future Use (Y-axis). A regression line indicates the predicted values based on the model Y=1.173X−0.661Y = 1.173X - 0.661Y=1.173X−0.661. The plot reveals a strong positive association, suggesting that higher Acceptance significantly predicts an increased likelihood of future use.

Discussion

The findings from this study provide valuable insights into how students perceive ChatGPT as a writing tool in academic settings, highlighting its strengths and limitations. By engaging with ChatGPT iteratively during brainstorming, drafting, and revising processes, students experienced noticeable improvements in their writing. These findings align with global and local studies on the adoption of generative AI in education, offering a nuanced understanding of its role in enhancing learning outcomes while addressing ethical and trust-related concerns. The findings align with the Trust in Technology framework, as students' initial skepticism shifted toward cognitive and emotional trust through the iterative use of ChatGPT. This progression highlights the role of familiarity in shaping the Acceptance of AI.

Students in this study reported significant improvements in writing clarity, vocabulary, organization, and overall essay quality after using ChatGPT. These findings echo the global research by Su and Yang (2023), who identified personalized feedback and enhanced learning efficiency as key benefits of generative AI tools in education. The students' enhanced writing skills serve as a beacon of hope, demonstrating ChatGPT's potential to improve the quality of education significantly. The observed correlation between students' perceived usefulness of ChatGPT and their intention to use it in the future supports the Technology Acceptance Model (TAM) framework, which posits that ease of use and perceived benefits drive adoption behavior.

Locally, Khan et al. (2021) found that generative AI tools significantly improved English language proficiency among Pakistani university students, particularly in grammar and vocabulary. It aligns with this study's results, where vocabulary improvement was among the most highly rated aspects of ChatGPT's contribution ($M = 4.08$). Such findings underscore ChatGPT's capacity to address linguistic challenges in non-native English-speaking contexts, helping students refine their language skills and develop more effective writing habits.

However, consistent with prior research, students indicated that ChatGPT did not make writing easier but instead changed the nature of the task. Dunn et al. (2023) observed that AI tools require students to engage critically with feedback, iterating through multiple drafts to improve their work. This iterative approach was beneficial in promoting active learning, but it also introduced challenges, particularly for students who struggled to balance AI-generated feedback with their critical thinking.

Trust emerged as a critical factor influencing students' perceptions of ChatGPT. Initially, students expressed skepticism about the tool's reliability and ethical implications; however, their trust in it improved through iterative use. This progression aligns with the Trust in Technology framework (McKnight et al., 2011), which highlights how cognitive trust (the belief in accuracy) and emotional trust (the comfort in use) evolve through repeated interactions with technology. As students engaged with ChatGPT for drafting and revision, they relied more on its writing suggestions, reinforcing these trust dimensions. Ahmed's features, such as ChatGPT's adherence to content moderation policies, contributed to its perceived trustworthiness, aligning with findings by Kim et al. (2023) that trustworthiness and ethical behavior significantly influence user satisfaction with AI tools.

Locally, Ahmad and Ali (2022) emphasized the importance of instructor endorsement in fostering trust in AI technologies. In this study, students' positive experiences with ChatGPT were likely influenced by the structured assignment design, which provided clear guidance on how to engage with the tool. However, concerns about ethical usage persisted, with many students equating reliance on ChatGPT with academic dishonesty. It aligns with Sullivan et al. (2023), who found that students often perceive extensive use of AI tools as cheating.

The preference for combined grading by instructors and ChatGPT reflects students' desire to strike a balance between human judgment and AI support. As noted in prior studies (Nazaretsky et al., 2022; Chen & Zhang, 2022), students value the efficiency of AI-generated feedback but prefer human oversight in high-stakes assessments. This finding underscores the importance of transparent policies and collaborative evaluation methods, reassuring the audience about the continued value of human judgment in education.

The structured use of ChatGPT in this study illustrates its potential to enhance the learning experience. ChatGPT helped students engage more deeply with their writing by providing personalized feedback and facilitating iterative revisions. The results support the Technology Acceptance Model (TAM) (Davis, 1989), as students who found ChatGPT helpful and easy to use showed a significantly higher likelihood of continued adoption. This confirms that perceived usefulness and ease of use are key drivers in the adoption of AI-assisted writing among ESL learners. These findings are consistent with Zastudil et al. (2023), who reported that students appreciated AI-generated programming exercises and explanations in computing education. However, like Zastudil et al.'s participants, students in this study expressed concerns about over-reliance on ChatGPT and its occasional inaccuracies.

Ethical challenges also remain a pressing issue. Rehman et al. (2023) noted that Pakistani STEM students frequently expressed concerns about plagiarism and the ethical implications of AI use. In this study, similar concerns emerged, particularly regarding the extent to which students could rely on ChatGPT without compromising academic integrity. Halaweh (2023) proposed requiring students to explicitly acknowledge AI contributions in their work to address these concerns. Adopting such practices could promote ethical engagement with AI tools while encouraging students to critically evaluate AI-generated content.

Building on the findings of Ahmad and Ali (2022), institutional trust emerges as a pivotal factor in AI adoption. As demonstrated in this study, instructor endorsement has a significant influence on students' confidence in ChatGPT, reinforcing the broader argument that structured AI literacy programs enhance trust and engagement with generative AI tools. Educators play a pivotal role in bridging the gap between AI capabilities and student needs. A significant aspect of this integration is preparing teachers to manage AI-supported classrooms effectively. Training programs should include modules on identifying and mitigating biases in AI outputs, as noted by Mhlanga (2023*),* and strategies for designing assignments that encourage critical engagement with AI tools. The role of institutions is also vital in establishing policies that align with local cultural and educational priorities. For example, institutions in Pakistan must address the infrastructural challenges identified by Rehman et al. (2023) to ensure equitable access to AI tools for students across socio-economic strata. Additionally, institutions could explore public-private partnerships to subsidize access to advanced educational technologies, ensuring that all

students benefit from the features of ChatGPT. These collaborations can also support AI literacy initiatives, equipping students with the skills to navigate ethical dilemmas and use AI responsibly in academic and professional settings.

Building on the role of institutional trust in AI adoption, structured AI literacy programs and educator training play a crucial role in fostering responsible student engagement with generative AI tools. The findings from this study have several practical implications for educators and institutions. First, the structured use of ChatGPT highlights the importance of designing assignments that promote iterative learning and active engagement with AI tools. Such assignments help students refine their skills while developing a deeper understanding of the writing process.

Second, institutions must urgently prioritize AI literacy by providing training programs for students and instructors. These programs should emphasize the capabilities and limitations of AI tools, ensuring that users can engage with them responsibly and effectively. Locally, as noted by Ahmad and Ali (2022), instructor training is crucial in fostering trust and confidence in AI technologies. The audience should feel the pressing need to equip themselves with AI literacy to navigate the evolving educational landscape.

Third, this study underscores ChatGPT's potential to complement traditional grading systems. By providing rapid and detailed feedback, ChatGPT can help educators manage their workloads and assign more writing tasks without compromising the quality of feedback. However, human oversight remains essential, particularly in contexts requiring nuanced judgment.

Limitations and Future Directions

While this study provides valuable insights, it has certain limitations. The sample consisted entirely of first-year students in a Functional English course, which may limit the generalizability of the findings. Future research should explore ChatGPT's impact across diverse academic levels and disciplines, particularly in contexts with varying writing requirements. Additionally, the structured nature of the assignment may have constrained students' creative use of ChatGPT. Allowing students greater autonomy in engaging with AI tools while requiring transparency in their methods could provide richer insights into the natural integration of AI into academic tasks.

Longitudinal studies tracking changes in students' perceptions and writing skills over time would also be valuable. Research could examine the sustained impact of ChatGPT on learning outcomes and the predictors of long-term engagement with AI tools. Exploring regional factors, such as digital literacy and infrastructure, would further contribute to understanding how generative AI tools can be effectively adopted in diverse educational contexts.

Conclusion

This study demonstrates that ChatGPT has significant potential to enhance writing skills and foster active learning in academic settings. Providing personalized feedback and facilitating iterative engagement complements

traditional teaching methods, addressing the linguistic challenges faced by students in non-native English-speaking contexts. However, its integration must be guided by ethical considerations, transparent policies, and ongoing training for students and educators.

The findings align with international and local studies, emphasizing the importance of trust, transparency, and collaboration in leveraging AI technologies for education. Future research should focus on expanding the scope of AI applications, addressing ethical concerns, and developing innovative assignment designs that strike a balance between human creativity and AI capabilities. By doing so, educators and institutions can harness the transformative potential of generative AI tools, such as ChatGPT, while preserving the integrity and creativity that define education. As generative AI tools become more embedded in education, understanding the trust dynamics behind their use is vital. Educators should design structured writing tasks that guide responsible AI use, ensuring students develop trust and critical literacy.

This study extends existing research on the integration of generative AI in education by quantitatively examining the relationship between students' trust in ChatGPT and their perceived improvements in writing and future intent to use the tool. Applying the Technology Acceptance Model and Trust in Technology Framework in a low-resource Pakistani ESL context, the findings provide empirical evidence that trust is a key predictor of both writing enhancement and sustained engagement with AI-assisted learning. By providing actionable insights for educators, institutions, and policymakers, the study contributes to the development of effective strategies for responsible and scalable AI adoption in academic writing instruction.

Statements and Declarations

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