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The perception of ChatGPT-based feedback in Hindi writing classes: A case study of Korean university students majoring in Hindi

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Abstract

This study explores how Korean university students majoring in Hindi perceive and use ChatGPT-based feedback in an intensive Hindi writing course. Using a mixed-methods design, the study surveyed 24 students and interviewed 8 participants who completed a 32-hour program at Hankuk University of Foreign Studies in June 2025. Learners rated AI feedback as highly effective in grammar (M = 4.33), spelling (M = 4.21), and sentence structure (M = 3.92), while cultural appropriateness received the lowest score (M = 2.79). Reported advantages included immediacy (95.8%), repeatability (79.2%), and reduced anxiety (66.7%), whereas key limitations were insufficient cultural understanding (83.3%) and restricted creativity (70.8%). Interview data supported these findings, indicating that students relied on AI for quick, low-stakes revisions but sought instructor feedback for tasks involving cultural nuance and emotional expression. The results suggest that while ChatGPT facilitates self-regulated learning in form-focused writing, it remains limited in meaning-making and identity-related dimensions. Therefore, a hybrid model combining AI tools and human instructors is recommended to support both linguistic accuracy and culturally appropriate expression. This study offers practical implications for integrating AI into foreign language learning and highlights the evolving role of educators in the age of generative AI.

Keywords: AI feedback, Automated written feedback (AWF), ChatGPT, Foreign language learning, Hindi writing, Student perception.

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1. Introduction

1.1. Research Background and Significance

The digital revolution of the 21st century has brought about fundamental changes to the educational paradigm. Language education in particular is entering a new phase characterized by learner-centered, personalized and immediate feedback-based approaches, driven by the development of artificial intelligence (AI) technology. Traditional, teacher-centered language education relied heavily on teachers' time and resources; however, AI-based learning environments now enable learners to independently check feedback and adjust their learning at any time and in any place, thereby fostering an autonomous learning system [1]. This is significant, as it enables learners to actively design and manage their own learning process, rather than merely acquiring language knowledge.

In the context of foreign language education in Korea, Hindi poses unique challenges. The Devanagari script, complex inflectional grammar and diverse honorific and polite language systems make it a challenging language [2] for Korean learners. Writing education in particular involves higher-level tasks that require learners to understand cultural contexts and social pragmatic norms, going beyond the mere accumulation of vocabulary and grammatical knowledge. This complexity highlights the limitations of traditional lecture- or textbook-centered learning.

In this context, ChatGPT-based feedback is significant in more ways than simply as a learning tool. AI can provide personalized feedback on demand, facilitate repetitive error correction and self-assessment, and supplement areas where teacher feedback is lacking. Furthermore, continuous feedback through AI tools can lead to increased motivation, self-efficacy and self-regulated learning abilities [3]. However, there is also concern that blind reliance on AI could hinder learners' creative thinking and critical reflection [4]. Therefore, it is urgent and important to clarify the effects and limitations of AI feedback on learners' writing development and explore its application in educational settings.

1.2. Review of Previous Studies

1.2.1. The Effectiveness of AI Feedback

The effectiveness of AI-based automated written feedback (AWF) has been demonstrated through various meta-analyses and systematic review studies, though with varying effect sizes across different research contexts and AI technologies. Traditional automated writing evaluation (AWE) systems have shown consistent positive effects on writing development. A three-level random-effects meta-analysis synthesizing 20 studies ($k = 84$; $N = 2,828$) estimated a medium overall effect on writing performance ($g = 0.55$) while noting significant heterogeneity across primary studies [5]. The significant heterogeneity detected indicates that automated feedback tools cannot be understood as a single consistent form of intervention, with effectiveness varying substantially based on implementation contexts.

Similarly, a comprehensive meta-analysis of 26 primary studies ($N = 2,468$) revealed that AWE had a large positive overall effect on writing quality ($g = 0.861$, $p < .001$) [6]. The analysis also examined moderators such as educational level, learner type, and writing genre, suggesting that contextual factors significantly influence AWF effectiveness [6]. The advent of generative AI, particularly ChatGPT, has introduced new possibilities for automated feedback. A systematic review and meta-analysis of experimental studies revealed that ChatGPT improves academic performance, affective-motivational states, and higher-order thinking propensities while reducing mental effort, though it shows no significant effect on self-efficacy [4]. These findings suggest that generative AI may offer more comprehensive support than traditional AWE systems by addressing both cognitive and affective dimensions of learning.

Specific to ESL writing contexts, empirical evidence demonstrates promising results for ChatGPT-based feedback. A mixed-methods intervention with tertiary-level ESL students reported significant gains in academic writing across three assessments and overwhelmingly positive learner perceptions (Mahapatra, 2024). The study also highlights ChatGPT's potential as a formative feedback tool, particularly in Global South settings where students commonly have access to portable computing devices and the internet [7].

However, a comprehensive systematic review of 83 SSCI-indexed articles on AWF (1993–2022) offers a more nuanced perspective [8]. Most studies (57.6%) focused on form-related feedback, with relatively fewer addressing meaning-related feedback—likely reflecting the limited affordances of traditional AWF systems [8]. More critically, the review concluded that "no conclusive evidence was found to support the effectiveness of AWF in comparison to teacher feedback," suggesting that AWF and teacher feedback may target different facets of the writing construct [8].

These findings collectively suggest that while both traditional AWE and generative AI-based feedback demonstrate potential benefits for writing development, their effectiveness depends significantly on learning context, feedback target, study design features, and the specific characteristics of both learners and interventions. The variation in reported effect sizes across these meta-analyses underscores the complexity of AWF implementation and highlights the need for more rigorous comparative studies that distinguish between different types of AI technologies and their specific applications in writing instruction.

1.2.2. Educational Applications of AI Tools

There has recently been active discussion in educational settings about the potential applications and ethical use of generative AI tools, such as ChatGPT. A recent meta-analysis examining the effects of ChatGPT on students' learning performance and higher-order thinking found overall gains across course types, with the largest impacts in skills-focused courses [3]. A systematic review and meta-analysis of experimental studies further reported improvements in academic performance, affective-motivational states, and higher-order thinking, alongside reduced mental effort [4]. A mixed-methods intervention in ESL writing likewise established ChatGPT's promise as a pedagogic tool—particularly in Global South contexts where students commonly have access to portable devices and the internet [7]. In qualitative terms, it was

also reported that, while ChatGPT use positively influenced idea generation, sentence development and argument construction in a study with high school students, concerns about reduced self-expression and weakened critical thinking coexisted [9].

1.2.3. Advantages and Limitations of AI Feedback

AI-based feedback offers learners immediacy, specificity, and consistency, supporting writing development and self-regulated learning when implemented with appropriate scaffolds [8, 10, 11]. In argumentative writing, both AI-generated and teacher feedback significantly improved students' performance with no statistically significant difference between [12]. However, frequent use of AI was found to be associated with diminished critical thinking and heightened cognitive offloading, indicating potential drawbacks of overreliance on such tools despite their instructional benefits [13]. Moreover, Comparative studies also show that well-trained human evaluators generally provide higher-quality feedback than ChatGPT, although generative AI can still be useful for formative early drafts or when a trained educator is unavailable [14]. Studies have identified personalized learning through evaluating and giving feedback on essay writing as a potential strength of generative AI, which can help decrease teacher workload and prevent teacher burnout [11, 15]. However, concerns persist about students mindlessly accepting information provided by AI without developing critical thinking skills.

1.2.4. Foreign Language Learning in the Korean Educational Context

In the context of foreign language education in Korea, learners' cultural and psychological dispositions play a crucial part in determining their engagement in the classroom. For instance, it has been observed that Korean university students tend to refrain from speaking in class, a tendency which is thought to be due to hierarchical classroom norms and cultural values that prioritize saving face [16]. Structured small-group task-based activities have been suggested as a pedagogical intervention to address such passivity, enhancing learner participation by fostering opportunities for oral interaction and promoting the use of higher-order questions and responses. More recently, the integration of AI-assisted writing tools has transformed educational practices in Korean English as a foreign language (EFL) contexts further. Using ChatGPT for sentence-level revision was found to have several perceived benefits, including providing immediate feedback, overcoming time and spatial limitations, and improving grammatical accuracy and paragraph cohesion [17]. However, concerns have also been raised about difficulties in understanding feedback, reduced creativity, and copyright issues. Overall, the integration of digital tools in foreign language education in Korea has the potential to transform learning experiences, making them more creative and dynamic.

1.3. Distinctiveness from Previous Studies

Previous studies on AI feedback have primarily focused on Western languages such as English or major Asian languages like Chinese. While these studies have contributed to demonstrating the effectiveness of AWF, they are largely limited to Latin-based alphabets or the Chinese character system, leaving the effects of AI feedback on non-Western languages such as Hindi, which belongs to the Indo-Aryan language family, largely unexplored.

Second, previous studies have been conducted in general language learning environments, with limited analysis of the experiences of learners studying Hindi in the specific cultural and educational context of Korea. Korean learners of a foreign language tend to hesitate to speak in class due to traditional classroom culture and face-oriented tendencies [16] which create unique patterns in their use of AI feedback and attitudes toward it.

Third, this study distinguishes itself by exploring the role of AI feedback in a specialized learning environment, namely an intensive education program. In intensive courses that require high-density learning over a short period, the role of immediate and repeatable AI feedback becomes even more critical, and this context clearly distinguishes it from previous studies conducted in general classroom settings.

Fourth, this study applied a mixed-methods approach combining quantitative and qualitative research to analyze the effects of ChatGPT feedback in a multi-layered manner. Quantitative analysis through surveys revealed clear effectiveness in formal-focused areas such as grammar, spelling, and sentence structure, while qualitative analysis through semi-structured interviews identified limitations in cultural context, meaning interpretation, and creative expression, as well as learners' mixed emotional responses. Through this, the study aims to simultaneously highlight the positive potential and inherent limitations of AI feedback and to concretely reveal its complementary relationship with teacher feedback.

1.4. Research Questions

T This study aims to comprehensively examine how students majoring in Hindi employ AI feedback in their writing learning process, while identifying its pedagogical effects and inherent limitations. In particular, this study focuses on clarifying how AI feedback acts differently in the areas of formal accuracy (grammar, spelling, sentence structure) and meaning and cultural appropriateness and further explores the possibility of combining AI feedback with instructor feedback. Through this, this study aims to reexamine the role of instructors in Hindi education in the AI era and provide implications for building an effective feedback ecosystem.

The specific research questions are as follows:

RQ1: What are the main difficulties Korean university students experience in Hindi writing learning, and what strategies and tools do they use to address these difficulties?

RQ2: What are the current usage patterns of AI feedback tools among Hindi major students, and how do these patterns vary depending on learning objectives and contexts?

RQ3: What are the main advantages and limitations of AI feedback as perceived by students, and how are these related to the writing system and linguistic characteristics of Hindi?

RQ4: How does the effectiveness of AI feedback vary across different domains of Hindi writing (e.g., grammar, spelling, vocabulary choice, sentence structure, cultural appropriateness, etc.)?

RQ5: How do learners compare and perceive AI feedback and instructor feedback, and how can an effective combination model be designed?

2. Research Methods

2.1. Research Design

This study employed an explanatory sequential design within a mixed methods research framework to investigate the role and effectiveness of AI-generated feedback in Hindi writing instruction [18]. This methodological approach was selected in recognition of the multifaceted nature of AI feedback and learner experience—phenomena that cannot be adequately captured through quantitative data alone. While statistical analyses help identify overarching patterns and trends, qualitative inquiry is indispensable for gaining deeper insights into learners' perceptions, affective responses, and contextualized experiences. The explanatory sequential design is a two-step approach that first collects and analyzes quantitative data, followed by the collection of qualitative data to gain a deeper understanding and explanation of the results. In the first phase, quantitative data on the current status, perceptions, and effects of AI feedback among Hindi major students were collected through a structured online survey. In the second stage, we conducted in-depth interviews with selected participants based on the survey results to collect qualitative data, aiming to provide a deeper interpretation and contextual understanding of the quantitative results.

2.2. Research Design

The participants in this study were students enrolled in the Hindi Department at Hanuku University of Foreign Studies. The research participants consisted of 24 students who voluntarily agreed to participate in the study among those who participated in the 32-hour intensive Hindi education program conducted in June 2025.

Table 1.
Demographic of Participants.

	Category	**Frequency (n)**	**%**
Gender	Male	8	33.
	Female	16	66.7
Grade	1st	6	25.0
	2nd	9	37.5
	3rd	7	29.2
	4th	2	8.3
Interview participants	Total	8	33.3

When examining the basic demographic characteristics of the study participants, the gender distribution was 8 males (33.3%) and 16 females (66.7%), and by grade, there were 6 first-year students (25.0%), 9 second-year students (37.5%), 7 third-year students (29.2%), and 4th grade students (2, 8.3%).

Eight participants from the survey participated in in-depth interviews for qualitative research. The interview participants were selected through purposive sampling, applying the principle of maximum variation sampling. The selection criteria included representation of different grades, diversity in AI tool usage experience, diversity in Hindi proficiency levels, and willingness to participate in the interview.

This study was conducted over five days, from June 23 to 27, 2025, for a total of 32 hours, as part of an intensive Hindi education program. The program was designed as an immersive education for students majoring in Hindi at Hankuk University of Foreign Studies, with the goal of improving their Hindi writing skills in a short period of time.

The curriculum was structured in a step-by-step and systematic manner. In the initial stage, basic writing skills were developed through basic grammar review, short sentence writing, and diary writing. In the middle stage, paragraph writing and experience writing activities were conducted based on in-depth learning of complex sentence structures and tense systems. In the latter part, students learn formal writing styles through activities such as describing photos, writing essays, letters, and explanatory texts. The final stage concludes the program with essays and creative writing activities that address cultural contexts and idiomatic expressions.

The teaching staff consisted of a team of one Korean instructor and two foreign instructors. The foreign instructors were responsible for guiding natural expressions, correcting pronunciation and colloquial speech, and explaining the cultural background of India. The Korean instructor provided grammar explanations tailored to the linguistic characteristics of the learners, contrastive analysis with Korean, and guidance on learning strategies.

Additionally, an environment was created where learners could freely use AI tools, and ChatGPT was recommended as a primary option. Furthermore, the faculty provided guidance on the strengths and weaknesses of each tool and appropriate usage methods, as well as ethical usage principles to prevent excessive reliance on AI, and guidelines for the complementary use of AI feedback and instructor feedback.

2.3. Data Collection

This study applied an explanatory sequential design to explore how learners utilized and accepted AI feedback tools in Hindi writing classes and how they perceived their effects. In Phase 1, a survey was conducted to quantitatively assess learners' overall experiences and perceptions. In Phase 2, semi-structured interviews were conducted to deepen the findings from Phase 1. This approach is suitable for interpreting the emerging phenomenon of AI feedback in a multi-layered manner.

2.3.1. Quantitative Data Collection: Structured Survey

Quantitative data was collected in June 2025 from 24 students who participated in the intensive education program at the Hindi Department of Hankuk University of Foreign Studies. The survey was conducted online (Naver Forms) with prior notification and anonymity to ensure voluntary participation.

The questionnaire was developed based on prior research and consultations with field experts, and its clarity and appropriateness were reviewed through a pilot survey. The final questionnaire was structured into three sections (A, B, C):

Table 2.
Survey Question Areas.

Area	N.	Main Content	Response Format
Experience in learning Hindi writing	A1	The most challenging aspects of writing	Select 3 items
	A2	Learning tools primarily used during writing	Multiple selections
	A3	Moments when you felt your writing skills improved	Single selection
Experience with AI feedback	B1	Frequency of Using AI-Based Tools	5-point Likert scale
	B2	AI tools used	Multiple selections
	B3	Advantages of AI feedback	Multiple selections
	B4	Limitations of AI feedback	Duplicate selection
	B5	Level of assistance in writing areas	5-point Likert scale
Open-ended questions	C1	Experience with AI tools and impressions	Descriptive
	C2	Views on the role of educators in the AI era	Descriptive

2.3.2. Qualitative Data Collection: Semi-structured Interviews

Semi-structured interviews were conducted to complement the quantitative analysis results and explore learners' experiences in depth. Participants were eight individuals who voluntarily expressed their willingness to participate among survey respondents. A maximum variation sampling strategy was applied, considering factors such as grade level, gender, Hindi learning experience, and AI usage level.

The interviews were conducted in a one-on-one face-to-face format in a classroom on campus, with each session lasting approximately 5 minutes. The main questions were linked to the survey items and were structured around the following four areas:

Table 3.
Semi-structured interview questions by area

Area	Key Questions	Exploratory Focus
Learning Hindi writing	• What was most difficult? • How did your strategies change? • When did you feel accomplished?	Challenges, strategy changes, and achievement experiences
Experience with AI tools	• Why did you start using AI? • How did your usage evolve? • Which features were helpful?	Motives, usage patterns, and functional experiences
AI feedback	• When was AI feedback helpful? • Were there errors or disappointments? • How does it differ from instructor feedback?	Strengths/limits of AI feedback and comparison with instructor
Future and instructor role	• What role should instructors play? • How could AI and instructors collaborate? • What advice for learners?	AI–instructor collaboration, future roles, and learner guidance

2.4. Data Analysis

This study was conducted using a mixed-methods research design, with quantitative and qualitative analyses conducted independently and then integrated in a complementary manner in the interpretation phase. The quantitative analysis calculated descriptive statistics, such as response frequencies, percentages, means (M) and standard deviations (SD), for each question. This enabled us to identify overall trends in learners' perceptions of the difficulties of Hindi writing, their experiences of AI feedback and their views on its effectiveness and advantages and disadvantages. Additionally, the main responses to open-ended questions were categorized and subjected to descriptive analysis. Qualitative analysis was conducted based on semi-structured interviews.

3. Research Results and Discussion

3.1. Hindi Writing Learning Experiences

According to the survey results, the elements that learners identified as the greatest difficulties in Hindi writing were grammar rule application (91.7%), sentence structure (83.3%), and honorific usage (70.8%) (A1). Additionally, vocabulary selection (66.7%) and spelling (50.0%) were frequently mentioned, and some respondents selected Devanagari script writing or cultural expressions as additional challenges. This demonstrates that Hindi's complex grammatical system, gender distinctions, verb conjugation, and honorific system pose linguistic challenges for Korean learners.

Table 4.
Summary of Survey Results Related to Hindi Writing Learning Experiences.

Category	Sub-item	%
Core Difficulty of Writing (A1)	Application of Grammar Rules	91
	Sentence Structure	83.3
	Use of honorifics	70.8
	Vocabulary selection	66.7
	Spelling	50.0
	(Other: Devanagari script, content structure, cultural expressions)	Low
Utilization Strategies and Materials (A2)	AI Tools	91.7
	Online translators	87.5
	Hindi dictionary	75.0
	YouTube and other video materials	66.7
	Online learning sites	54.2
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	Online translation tools	87.5
	Hindi dictionary	75.0
	YouTube and other video materials	66.7
	Online learning sites	54.2
	(Others: grammar books, Indian acquaintances, etc.)	Low
Perceived improvement in writing skills (A3)	Reduction in AI errors	79.2
	Complex sentence structure possible	66.7
	Able to communicate with Indians	62.5
	(Other: positive feedback from instructors, peer comparisons, etc.)	Low

To overcome these challenges, learners utilized a variety of materials and strategies (A2). The most commonly used resources were AI tools (91.7%) and online translation tools (87.5%), followed by Hindi dictionaries (75.0%), video materials such as YouTube (66.7%), and online learning sites (54.2%). This suggests that learners are utilizing not only text-based resources but also multimodal materials.

In response to a question about when they felt their writing skills had improved (A3), learners reported feeling a sense of achievement when errors decreased in AI tools (79.2%), when they could construct complex sentences (66.7%), and when they could communicate with Indians in real life (62.5%). Additionally, some respondents mentioned receiving positive feedback from instructors or comparing their progress with peers as factors contributing to their perceived improvement, indicating that indicators of achievement are not singular but multifaceted.

These results suggest that while learners find formal elements such as grammar, sentence structure, and honorifics the most difficult in Hindi writing, they are actively utilizing AI tools and online materials to expand their learning strategies. At the same time, by citing error reduction, complex sentence generation, and the ability to communicate in real life as indicators of achievement, the findings demonstrate that AI feedback positively contributes to promoting self-efficacy and self-regulated learning.

3.2. Usage Experience and Utilization Patterns of AI Feedback Tools

According to the survey results, the majority of participants (87.5%) reported having experience using AI-based tools in the Hindi writing process (B1). In terms of usage frequency, "occasionally (1–2 times per week)" accounted for the highest proportion at 41.7%, followed by "frequently (3 or more times per week)" at 29.2%. On the other hand, "I rarely use it (once or twice a month)" accounted for 16.7%, "I have used it before" accounted for 12.5%, and "I have no experience using it" accounted for 12.5%, indicating that learners generally use AI tools as a relatively common auxiliary tool.

3.3. Degree of Assistance from AI Feedback

Question B5 measured the effectiveness of AI feedback across six areas (grammar, spelling, vocabulary, sentence structure, natural expression, and cultural appropriateness). The results are as follows.

Table 5.
Average Likert scale scores for the effectiveness of AI feedback.

Evaluation Item	M	SD
Basic Grammar Check	4.30	0.60
Spelling and notation	4.21	0.81
Sentence Structure Improvement	3.92	0.73
Vocabulary selection	3.8	0.89
Natural expression	3.71	1.01
Cultural appropriateness judgment	2.79	1.12

Based on the results measured through Item B5, learners evaluated AI feedback as most effective in basic grammar checking (M=4.33, SD=0.69) and spelling and punctuation (M=4.21, SD=0.81). Sentence structure improvement (M=3.92) and vocabulary selection (M=3.88) were also relatively positively perceived, but natural expression (M=3.71) received a somewhat lower score. In particular, judgment of cultural appropriateness (M=2.79, SD=1.12) showed the lowest average score, indicating that learners clearly recognize the limitations of AI feedback in terms of cultural context and social nuances.

Consistent with earlier findings, the results indicate that automated feedback systems are well-suited for form-focused correction (e.g., grammar and spelling), yet remain constrained in their capacity to address content development or discourse-level coherence [3, 4]. This perception was also explicitly expressed in in-depth interviews. One learner mentioned, “ChatGPT used the expression ‘your country,’ which sounded odd. In Hindi, we don’t use such expressions when addressing someone else” (Participant M), pointing out that AI can make errors in cultural appropriateness. This suggests that Hindi’s honorific culture and context-dependent expressions are not sufficiently reflected in AI training data, highlighting the continued need for instructor feedback to address cultural literacy and pragmatic appropriateness.

3.4. Advantages and Limitations of AI Feedback

According to the results of survey question B3, learners cited the ability to obtain immediate results (95.8%), the possibility of repeated learning (79.2%), and the ability to ask questions without embarrassment (66.7%) as the greatest advantages of AI feedback. Some learners also mentioned the availability of feedback at any time, the provision of various alternatives, and objective evaluation as advantages. This suggests that learners are experiencing a positive environment that promotes self-regulated learning (SRL) by enabling them to receive feedback safely without time or space constraints.

On the other hand, in question B4, learners pointed out the following as the main limitations of AI feedback: lack of understanding of cultural context (83.3%), limitations in recognizing creative expressions (70.8%), uniform revision suggestions (66.7%), and lack of emotional support (62.5%). Some learners also responded that ignoring individual learner characteristics, providing inaccurate information, and difficulties in resolving complex errors were drawbacks.

In summary, AI feedback has the advantage of promoting learning engagement through immediacy, repetition, and psychological stability, but it still has limitations in terms of cultural sensitivity and ensuring creative expression. Therefore, it was confirmed that AI should be used as an auxiliary tool in the initial draft review stage, while in-depth and contextual feedback should be provided by instructors.

Table 6.
Learners' perceptions of the advantages and limitations of AI feedback.

Category	Sub-item	%
Advantages	Immediate results	95.
	Repeatability	79
	Ability to ask questions without embarrassment	66
	Available anytime	Some
	Various alternatives provided	Some
	Objective evaluation	Some
Limitations	Lack of understanding of cultural context	83
	Limited recognition of creative expression	70
	Uniform revision proposals	66
	Lack of emotional support	62.5
	Ignoring individual learner characteristics	Some
	Inaccurate information provided	Some
	Difficulty in resolving complex errors	Some

3.5. Complementary Model of AI Feedback and Instructor Feedback

Based on open-ended survey responses and interview analysis, learners recognized that, although AI feedback is useful as an initial tool in the learning process, instructor feedback is essential for the final review stage and for in-depth learning. Many students suggested a double-loop structure where they 'draft using AI and receive a final review from instructors' as their preferred learning strategy. This shows that learners use AI as an efficient supplementary tool rather than relying on it entirely.

The necessity of instructor feedback was repeatedly emphasized in in-depth interviews. One learner stated, 'AI corrects grammar and spelling, but understanding the context and cultural nuances of the text is ultimately the instructor's role' (Participant G). Another learner stated that "AI provides results quickly, but the instructor is much better at explaining why something is wrong", clearly highlighting that AI and instructors provide feedback of different natures.

These results are consistent with previous studies which have shown that AI-based feedback is effective in terms of immediacy, repetition and formal accuracy, but that contextual interpretation and the promotion of creative expression are the exclusive domain of instructors [19, 20]. In other words, AI is excellent at correcting mechanical errors and rapidly revising drafts, while instructors complement these results by interpreting them in a way that aligns with the learner's level and context. They act as mediators, coaches, and facilitators of critical thinking. Therefore, in language education involving complex grammatical structures and multi-layered cultural contexts, such as Hindi, combining AI with human instructors can be an effective way to promote learners' writing development.

3.6. Discussion

The results of this study demonstrate that ChatGPT-based feedback can serve as a useful supplementary tool to support learners' language development in Hindi writing education. As confirmed through surveys and interviews, learners experienced the most significant effects of AI feedback in form-focused areas such as grammar rules, spelling, and sentence structure. This suggests that automated feedback acts as a positive factor by quickly correcting structural errors and enabling repeated checks, thereby promoting self-regulated learning. In fact, many learners reported feeling a sense of accomplishment through the experience of receiving fewer error corrections from AI feedback, which led to increased self-efficacy and learning persistence.

However, this study also identified limitations in AI feedback's ability to process cultural contexts and constraints on creativity. Learners pointed out that the feedback provided by AI was overly formal and uniform, and that it did not adequately reflect identity expression or emotional nuances. For example, one learner stated that their sentence was overly formalized by AI, causing the intended emotional expression to disappear. These results are in line with findings from a meta-analysis indicating that automated feedback yields significant improvements in grammatical and formal accuracy, yet demonstrates limited efficacy in supporting meaning-centered feedback or discourse-level appropriateness [6]. In other words, while AI-generated feedback effectively enhances learners' linguistic accuracy, it remains insufficient in fostering higher-order cognitive processes such as creative and critical thinking.

Therefore, AI feedback can maximize its educational effectiveness when used as a complementary tool rather than an independent means, in conjunction with instructor feedback. Learners preferred a structure where they first performed rapid and repetitive draft revisions through AI and then received instructor feedback to improve semantic appropriateness, cultural sensitivity, and creative expression. These results are consistent with previous findings suggesting that AI-based learning environments can enhance learner motivation and provide supportive conditions for engagement, but their effectiveness is significantly amplified when complemented by instructors' contextual guidance and creative pedagogical facilitation [20].

In summary, this study demonstrates that AI feedback provides positive effects in enhancing learners' autonomy, metacognitive strategies, and emotional stability, but still requires instructor intervention in cultural, creative, and identity-related aspects. This emphasizes the need to redefine the role of instructors in foreign language education in the AI era, moving beyond mere knowledge transmitters to become facilitators of critical thinking, contextual interpreters, and learning coordinators. Therefore, designing a hybrid feedback ecosystem where AI and instructors collaborate to implement learner-centered, customized writing education emerges as a critical challenge for future educational settings.

4. Conclusion and Recommendations

This study investigated how AI feedback tools such as ChatGPT were accepted and utilized in Hindi writing classes and how their effects and limitations were perceived by learners participating in the intensive education program at Hankuk University of Foreign Studies. By applying a mixed-method research design combining quantitative surveys and qualitative interviews, we were able to analyze the actual functions of ChatGPT-based feedback and learners' experiences in a multi-layered manner.

The results revealed that learners perceived AI feedback as an effective and useful learning tool in form-focused areas such as grammar checking, spelling correction, and sentence structure improvement. In particular, characteristics such as immediacy, repeatability, and reduced psychological burden acted as positive factors that promoted self-regulated learning and strengthened achievement and self-efficacy. However, clear limitations were revealed in meaning-focused and cultural domains. Learners pointed out that AI did not sufficiently reflect honorifics, cultural expressions, and emotional nuances, and sometimes overly mechanically and uniformly transformed sentences. This perception indicates that AI feedback is still insufficient to ensure learners' creativity, cultural appropriateness, and expression of identity. As a result, learners utilized AI as an "initial correction and review tool" and formed a dual feedback structure where final review and in-depth revisions relied on instructor feedback.

These results demonstrate that AI feedback and instructor feedback are not mutually exclusive but rather complementary. AI serves as an immediate and repetitive feedback provider, diagnosing learners' errors and supporting self-directed review, while instructors function as interpreters and facilitators of cultural context and discourse appropriateness, promoting learners' critical thinking and creative expression. Therefore, it is necessary to design a co-mediated feedback model where AI and instructors collaborate in future foreign language education.

The educational implications are as follows. First, the introduction of AI feedback does not weaken the role of instructors but rather provides an opportunity to redefine and elevate their expertise. While AI handles repetitive error correction, instructors can focus on higher-order domains such as creativity, emotional support, and fostering critical thinking. Second, learners must receive AI literacy education to critically accept AI feedback. Rather than simply accepting AI suggestions, the ability to review and selectively apply feedback is essential for developing sustainable learning competencies. Third, instructors must also undergo professional retraining on the functions, limitations, and ethical issues of AI feedback tools to prevent misuse by learners and guide them in effective utilization.

5. Limitations of the Research

This study has limitations in terms of the generalizability of the sample, as it was conducted with Hindi major students at a specific university, and it also has the constraint of not being able to objectively verify improvements in actual writing ability, as the analysis was based on learners' subjective perceptions. Therefore, future studies should compare writing task scores based on the use of AI feedback, analyze the consistency between instructor feedback and AI feedback, and conduct comparative studies on the effectiveness of tools such as ChatGPT.

6. Recommendations

Based on the findings, several practical and pedagogical recommendations can be offered for future research and instructional practice. The implementation of AI feedback systems such as ChatGPT should be paired with explicit instructor involvement to ensure that learners receive support not only in form but also in meaning, culture, and creativity. Instructors should view AI not as a replacement but as a tool that frees them from lower-order concerns and allows them to focus on facilitating deeper learning. Providing learners with AI literacy training that enables them to critically evaluate, interpret, and apply AI-generated feedback is essential for developing reflective capacity and sustaining self-regulated learning while avoiding blind reliance on automated suggestions. Institutions should offer professional development for language instructors, focusing on the affordances, limitations, and ethical considerations of AI integration in writing education. Future research should include controlled experiments comparing different AI feedback tools, measure actual writing gains, and explore how feedback perceptions vary across linguistic and cultural contexts to better understand the effectiveness of these technologies in diverse educational settings.

References

[1] R. Luckin, W. Holmes, M. Griffiths, and L. B. Forcier, "Intelligence unleashed: An argument for AI in education," 2016. https://static.googleusercontent.com/media/edu.google.com/en//pdfs/Intelligence-Unleashed-Publication.pdf

[2] C. P. Masica, *The indo-aryan languages*. Cambridge: Cambridge University Press, 1993.

[3] J. Wang and W. Fan, "The effect of ChatGPT on students' learning performance, learning perception, and higher-order thinking: Insights from a meta-analysis," *Humanities and Social Sciences Communications*, vol. 12, no. 1, pp. 1-21, 2025. https://doi.org/10.1057/s41599-025-04787-y

[4] R. Deng, M. Jiang, X. Yu, Y. Lu, and S. Liu, "Does ChatGPT enhance student learning? A systematic review and meta-analysis of experimental studies," *Computers & Education*, vol. 227, p. 105224, 2025. https://doi.org/10.1016/j.compedu.2024.105224

[5] J. Fleckenstein, L. W. Liebenow, and J. Meyer, "Automated feedback and writing: A multi-level meta-analysis of effects on students' performance," *Frontiers in Artificial Intelligence*, vol. 6, p. 1162454, 2023. https://doi.org/10.3389/frai.2023.1162454

[6] N. Zhai and X. Ma, "The effectiveness of automated writing evaluation on writing quality: A meta-analysis," *Journal of Educational Computing Research*, vol. 61, no. 4, pp. 875-900, 2023. https://doi.org/10.1177/07356331221127300

[7] S. Mahapatra, "Impact of ChatGPT on ESL students' academic writing skills: A mixed methods intervention study," *Smart Learning Environments*, vol. 11, no. 1, p. 9, 2024. https://doi.org/10.1186/s40561-024-00295-9

[8] H. Shi and V. Aryadoust, "A systematic review of AI-based automated written feedback research," *ReCALL*, vol. 36, no. 2, pp. 187-209, 2024. https://doi.org/10.1017/S0958344023000265

[9] S. Levine, S. W. Beck, C. Mah, L. Phalen, and J. PIttman, "How do students use ChatGPT as a writing support?," *Journal of Adolescent & Adult Literacy*, vol. 68, no. 5, pp. 445-457, 2025. https://doi.org/10.1002/jaal.1373

[10] S. S. Lee and R. L. Moore, "Harnessing generative ai (genai) for automated feedback in higher education: A systematic review," *Online Learning*, vol. 28, no. 3, pp. 82-106, 2024. https://doi.org/10.24059/olj.v28i3.4593

[11] M. Farrokhnia, S. K. Banihashem, O. Noroozi, and A. Wals, "A SWOT analysis of ChatGPT: Implications for educational practice and research," *Innovations in Education and Teaching International*, vol. 61, no. 3, pp. 460-474, 2024. https://doi.org/10.1080/14703297.2023.2195846

[12] A. Alnemrat, H. A. K. Aldamen, M. Almashour, M. Al-Deaibes, and R. AlSharefeen, "AI vs. teacher feedback on EFL argumentative writing: A quantitative study," in *Frontiers in Education*, 2025, vol. 10, p. 1614673, doi: https://doi.org/10.3389/feduc.2025.1614673.

[13] M. Gerlich, "AI tools in society: Impacts on cognitive offloading and the future of critical thinking," *Societies*, vol. 15, no. 1, p. 6, 2025. https://doi.org/10.3390/soc15010006

[14] J. Steiss *et al.*, "Comparing the quality of human and ChatGPT feedback of students' writing," *Learning and Instruction*, vol. 91, p. 101894, 2024.

[15] T. K. Chiu, B. L. Moorhouse, C. S. Chai, and M. Ismailov, "Teacher support and student motivation to learn with Artificial Intelligence (AI) based chatbot," *Interactive Learning Environments*, vol. 32, no. 7, pp. 3240-3256, 2024. https://doi.org/10.1080/10494820.2023.2172044

[16] S. A. DeWaelsche, "Critical thinking, questioning and student engagement in Korean university English courses," *Linguistics and Education*, vol. 32, pp. 131-147, 2015. https://doi.org/10.1016/j.linged.2015.10.003

[17] E. Bok and Y. Cho, "Examining Korean EFL college students' experiences and perceptions of using ChatGPT as a writing revision tool," *Journal of English Teaching through Movies and Media,* vol. 24, no. 4, pp. 15-27, 2023. https://doi.org/10.16875/stem.2023.24.4.15

[18] J. W. Creswell and V. L. Plano Clark, *Designing and conducting mixed methods research*, 3rd ed. Thousand Oaks, CA: SAGE, 2018.

[19] H. Bellhäuser, C. Dignath, and M. Theobald, "Daily automated feedback enhances self-regulated learning: A longitudinal randomized field experiment," *Frontiers in Psychology,* vol. 14, p. 1125873, 2023. https://doi.org/10.3389/fpsyg.2023.1125873

[20] C. Chen and Y. Gong, "The role of AI-assisted learning in academic writing: A mixed-methods study on Chinese as a second language students," *Education Sciences,* vol. 15, no. 2, p. 141, 2025. https://doi.org/10.3390/educsci15020141

Appendix.

Student Questionnaire on AI-Supported Hindi Writing.

A. Experience with Hindi Writing Learning

A1. What is the most challenging aspect of Hindi writing? (Select three in order of priority)

□ Writing Devanagari script □ Applying grammar rules □ Vocabulary selection □ Sentence structure □ Honorific usage □ Content organization □ Spelling □ Cultural expressions □ Others: _____

A2. What tools or materials do you primarily use when working on Hindi writing assignments? (Multiple selections possible)

□ Hindi dictionary □ Online translator (Google Translate, etc.) □ AI tools (ChatGPT, Grammarly, etc.) □ Hindi grammar book □ Indian friends or acquaintances □ Online Hindi learning sites □ YouTube or other video materials □ Others: _____

A3. When do you feel your Hindi writing skills have improved?

□ When receiving positive feedback from instructors □ When comparing with fellow students □ When errors decrease in AI tools □ When able to communicate with Indians □ When able to construct complex sentences □ Others: _____

B. AI Feedback Experience

B1. Have you ever used AI-based tools for Hindi writing?

□ Frequently (3 or more times per week) □ Occasionally (1-2 times per week) □ Rarely (1-2 times per month) □ Have used it before □ Never

B2. What AI tools have you used? (Multiple selections allowed)

□ ChatGPT □ Google Translate □ Grammarly □ Microsoft Translator □ Naver Papago □ DeepL □ Other: _____ □ No experience

B3. What do you think are the advantages of AI feedback? (Multiple selections possible)

□ Immediate results □ Available anytime □ Ability to ask questions without hesitation □ Repeatable learning □ Provides various alternatives □ Objective evaluation □ Other: _____ □ I don't know the advantages

B4. What are the limitations or drawbacks of AI feedback? (Multiple selections possible)

□ Lack of understanding of cultural context □ Uniform revision suggestions □ Limited recognition of creative expression □ Ignores individual learner characteristics □ Inaccurate information provision □ Inability to provide emotional support □ Difficulty resolving complex errors □ Other: _____

B5. How helpful is AI feedback in the following situations?

(1 = Not helpful at all, 5 = Very helpful)

a. Basic grammar check (1–5)

b. Spelling and notation (1–5)

c. Vocabulary selection (1–5)

d. Sentence structure improvement (1–5)

e. Natural expression (1–5)

f. Cultural appropriateness (1–5)

C. Open-ended Questions

C1. Please freely describe any thoughts or special experiences you had while using AI tools.

C4. What role do you think professors teaching Hindi should play in the AI era?

C5. Please share any free opinions or suggestions for improving Hindi writing education.