



Exploring Factors Affecting L2 Learners' Feedback-seeking Inquiry in AI-assisted Composition Revision

Shu Huang^{1*}, Wenpu Wang^{2,a}

¹Chengdu University of Information Technology, Chengdu, China

²Chengdu Technological University, Chengdu, China

*huangshu@cuit.edu.cn; ^awenpu.wang@cdu.edu.cn

Abstract. Generative AI offers comprehensive feedback in L2 writing, and yet its efficacy depends on learners' feedback-seeking behavior. However, insufficient studies have investigated feedback-seeking behavior in AI-assisted learning contexts. This study explores factors that might affect feedback-seeking inquiry among L2 learners in AI-assisted composition revision. The data of the study included questionnaire data and interaction logs from 113 Chinese EFL undergraduates. The study found that perceived usefulness of AI showed no correlation with either the number of prompts or the depth of prompts. While language proficiency showed no correlation with the number of prompts, higher-proficiency students produced significantly more in-depth prompts than intermediate and lower-proficiency students. No significant difference was detected between intermediate and lower-proficiency groups regarding the depth of the prompts. The findings indicate that the perceived usefulness of AI feedback does not necessarily correlate with feedback-seeking inquiry. The study contributes to the understanding of how L2 learner characteristics shape student-AI interaction.

Keywords: feedback-seeking behavior; language proficiency; learner perceptions; AI-assisted composition revision; second language writing

1 Introduction

With the development of generative artificial intelligence (AI) technology, AI tools can provide effective feedback at both global (i.e., content and organization) and local (e.g., language) levels [1], and hence have the potential of empowering second language (L2) writing instruction. However, studies have found that the effectiveness of AI-generated feedback hinges heavily on the way students seek and utilize the feedback [2]. Therefore, understanding students' feedback-seeking behavior is crucial.

Feedback-seeking behavior was initially coined by [3] as a conscious move to adapt to a particular environment. It is found to be a strong predictor of L2 students' writing performance [4], and could be the key to understanding learner agency in feedback-related activities [5]. So far, researchers have identified a variety of mediating factors influencing feedback-seeking behavior [4] [5][6]. Nevertheless, current studies tend to focus on teacher feedback, and few have targeted this issue in the context of AI-assisted

composition revision. Moreover, studies often rely on self-reporting questionnaires to observe students' feedback-seeking behavior, which might be subject to desirability bias.

The present study, therefore, aims to explore factors that might mediate L2 learners' feedback-seeking behavior in the context of AI-assisted composition revision. The findings of the study could inform the research on feedback-seeking behavior and the design of effective interventions for AI-assisted revision.

2 Literature review

2.1 Feedback-seeking Behavior in L2 Learning

One of the most influential models of feedback-seeking behavior was proposed by [7], which posits that individuals seek feedback actively from their environments by using mainly two metacognitive strategies: feedback monitoring and feedback inquiry. Feedback monitoring refers to acquiring feedback information from the environment by observing the behaviors of other people; feedback inquiry pertains to the explicit request for opinions and feedback on one's own performance.

Based on this model, studies have introduced a variety of theoretical frameworks to explore factors that might motivate L2 learners' feedback-seeking behavior [5] [6][8], one of which is the cost-value framework. The framework suggests that individuals weigh the perceived benefits against the perceived costs of seeking feedback before they actually do so [7]. [9] adopted the theory to second language writing, and their analysis showed that the perceived value of feedback could strongly predict feedback-seeking behavior. The framework was further extended by [6] to examine feedback-seeking behavior among Chinese tertiary English learners regarding teacher feedback. While these studies have illustrated that learner perceptions of feedback could shape students' feedback-seeking behavior, their investigation was limited to teacher feedback. There is a need to conduct studies that target other sources of feedback.

2.2 Factors Affecting Feedback-Seeking Behavior

Studies have identified a variety of factors that might affect L2 learners' feedback-seeking behavior in L2 writing, such as language mindsets [5][10], goal orientations [5][10], learners' ideal L2 writing self [11][4], and their perceptions of the feedback [6][9]. A number of qualitative studies examining student engagement with feedback have also suggested that L2 proficiency might be an important learner factor that could influence learners' cognitive engagement with feedback [12][13]. While this body of research has advanced our understanding of the factors influencing feedback-seeking behavior, the number of studies remains limited. In addition, current studies generally rely on students' self-reports to capture their feedback-seeking behavior [6][9]. Given the social desirability or recall bias that might be caused by self-report data, studies could consider incorporating data from other sources into the inquiry.

To provide insights into the issues above, the present study examined several factors influencing students' feedback-seeking inquiry among a group of Chinese EFL undergraduates who engaged in an English composition-revision task. Notably, the study observed feedback-seeking inquiry through prompts that students made during the revision, which are "external manifestations of learners' thinking patterns and cognitive strategies" [14]. To be specific, we analyzed both the quantity and quality of the prompts.

The study addressed the following questions: 1) What is the relationship between L2 learners' perceptions of AI feedback and feedback-seeking inquiry (i.e., the number and depth of prompts) in the context of AI-assisted composition revision? 2) To what extent does learners' second language proficiency affect feedback-seeking inquiry (i.e., the number and the depth of prompts) in the context of AI-assisted composition revision?

3 Method

3.1 Participants and the Context

113 participants were recruited for the study based on a combination of convenience sampling and purposive sampling. First, the researcher approached two Chinese college English teachers at a university in China, both of whom were interested in AI-assisted composition revision. Then, she invited the students in the class of the teachers to participate in the study, 120 of which eventually indicated agreement and signed the informed consent. However, 7 students failed to submit the full data, leaving 113 participants. The students had different proficiency levels, with their scores in the English section of the Gaokao (China's college entrance exam) ranging from 78 to 144. They were all first-year undergraduates majoring in science, and all had used generative AI tools (e.g., ChatGPT, Doubao, Deepseek) prior to the study.

3.2 Data Collection and Data Analysis

The data included questionnaire responses and the students' AI interaction logs. The questionnaire probed into students' language proficiency, and students' perceptions of AI for composition revision. Questionnaire items assessing L2 learners' perceptions were adapted from [9].

The data were collected over three phases. In the first phase, the participants completed a questionnaire that probes into their language proficiency (scores in English test of Gaokao), and their perceptions of AI for composition revision. Then, the two English teachers gave English writing instruction (90 min). In the subsequent phase, they asked students to complete a 150-word argumentative writing composition independently in class (30 min) as required by the course. In the third phase (45 min), students were asked to revise their writing with the assistance of AI before submitting the final drafts. While *Doubao* AI was explicitly recommended, students could use any AI tool of their choice for the revision. At the end of the class, all students submitted their final drafts and their AI interaction logs.

To answer the research questions, prompts in student-AI interaction logs were transcribed, and the number of prompts was recorded for each participant. The prompts were then rated using Bloom's taxonomy of cognitive processes as described in [14]. The two authors rated the prompts independently using the predefined classification criteria (Appendix A), with Bloom's taxonomy levels coded numerically: Knowledge =1, Comprehension =2, Application =3, Analysis = 4, Evaluation = 5, Creation = 6. Final decisions were made only when the agreement was reached. Language proficiency was determined by the students' scores in the English section of Gaokao. The internal consistency of the L2 learners' perceptions was assessed using Cronbach's alpha, which demonstrated good reliability ($\alpha = .87$). Both descriptive and inferential statistical analyses were conducted using SPSS 26.0. Shapiro-Wilk tests indicated violations of normality for all variables (all $p < .05$). However, given our sample size ($N = 113$), parametric tests were employed.

4 Results and Discussion

4.1 Relationship Between L2 Learners' Perceptions of AI Feedback and Their Feedback-Seeking Inquiry

To answer the first research question, Pearson correlation analyses were conducted to examine the relationships between L2 learners' perceptions of AI feedback and both the number and depth of prompts they wrote during composition revision. Contrary to our expectations, no statistically significant correlations were found. As shown in Table 1, perception scores were not significantly correlated with either the number of prompts ($r(111) = .026, p = .785, 95\% \text{ CI } [-.048, .063]$) or the depth of prompts ($r(111) = -.045, p = .635, 95\% \text{ CI } [-.056, .034]$), suggesting that learners' general perceptions do not necessarily influence their feedback-seeking inquiry, in terms of both the quantity and quality of the prompts. This stands in contrast to [6] and [9] which found that L2 learners' perceptions of feedback could strongly predict their feedback-seeking inquiry. The discrepancy may be attributed to the distinct nature of AI-intermediated interaction. Another reason might lie in the different methods used to capture feedback-seeking behavior. Previous studies often measured this concept using self-reported questionnaires, while this study observed it through the actual prompts students wrote to seek feedback. This suggests that positive perceptions of feedback may not transfer automatically into competent use of feedback in the AI-assisted learning contexts.

Table 1. Descriptive Statistics and Correlations Among Perception, Number of Prompts and Depth of Prompts

	M	SD	Perceptions	Number of Prompts	Depth of Prompts
Perceptions	33.94	4.95	-	.785	-.045
Number of Prompts	2.42	1.46	.785	-	.06
Depth of Prompts	3.52	1.19	.635	.06	-

4.2 Relationship Between Learners' L2 Proficiency and Their Feedback-Seeking Inquiry

To address the second research question, two one-way ANOVAs were conducted to compare the higher-proficiency, intermediate-proficiency, and lower-proficiency groups. For the first sub-question (i.e., To what extent does learners' L2 proficiency affect the number of prompts they wrote during the AI-assisted composition revision?), the ANOVA revealed no statistically significant differences among the groups, $F(2, 110) = 0.866$, $p = .423$, $\eta^2 = .02$. This indicates that learners' L2 proficiency level does not significantly influence the quantity of prompts they generate during AI-assisted composition revision. However, the analysis revealed a statistically significant difference among the three proficiency groups (Table 2), $F(2, 110) = 3.429$, $p = .036$, $\eta^2 = .059$. This indicates that learners' L2 proficiency level significantly influences the depth of prompts they generate, although the effect size ($\eta^2 = .059$) is small. Post-hoc comparisons using Tamhane's T2 test (due to the violation of homogeneity of variances) further revealed that higher-proficiency learners produced significantly deeper prompts than both intermediate ($p = .001$) and lower-proficiency learners ($p = .003$). However, no significant difference was found between the intermediate-proficiency and lower-proficiency learners ($p = .959$), suggesting that prompt depth only distinguishes higher-proficiency learners from the other two groups.

The finding echoes previous studies [12][13] that L2 proficiency play an important role in students' engagement with AI feedback. Notably, the finding seemed to indicate that higher-order skills required for effective feedback-seeking inquiry emerge only after learners have attained a certain level of linguistic competence.

Table 2. Post-hoc Comparisons of Prompt Depth Among Three Proficiency Levels

Comparison	Mean Difference	SE	95% CI	<i>p</i>
Higher vs. Intermediate	1.14	.25	[.48, 1.80]	.001
Higher vs. Lower	1.04	.24	[.36, 1.72]	.003
Intermediate vs. Lower	-.11	.25	[-.68, .47]	.959

Note. Post-hoc tests conducted using Tamhane's T2. $p < .05$.

5 Conclusion

This study investigated factors influencing L2 learners' feedback-seeking inquiry among 113 Chinese EFL undergraduates. The study found no significant positive correlation between the learners' perceptions of AI feedback and their feedback-seeking inquiry. The study also found that higher-proficiency learners wrote significantly more in-depth prompts than the intermediate and the lower-proficiency learners.

The study has contributed to research on feedback-seeking behavior and provided important implications for pedagogy. Theoretically, it has shed new light on the relationship between learners' perceptions of AI feedback and their actual inquiry practices, suggesting that positive perceptions alone are not enough to promote active engagement with AI tools. Importantly, it calls for differentiated instruction strategies to

foster effective feedback-seeking among EFL learners at different proficiency levels. However, the study involved only 113 participants of science majors from a single university, which limits the generalizability of the findings. Future studies should expand the diversity of participants and may examine digital literacy as a potential mediating factor to deepen our understanding of students' feedback-seeking behavior in the context of AI-assisted composition revision.

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Appendix A

Prompt Classification Criteria (adapted from [14])

Bloom's taxonomy (1956)	Description	Sample
Knowledge	Ask to identify, recall, summarize, or recognize the topic	Summarize the key points of
Comprehension	Ask to explain and request details about the topic	Add more detail
Application	Inquire about the utilization of the topic to solve problems in various contexts	Demonstrate how the topic can be applied to classroom
Analysis	Seek to decompose situations into similarities with other concepts	Differentiate the topic
Evaluation	inquire about the value of the task (with the intention of revision)	Check grammar and formal tone
Creation	Ask to create an overview or structure of the task	Generate an outline for this topic

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