

# Empowering Dialogic Feedback in FLW with LLM

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## Abstract

This doctoral study aims to address significant challenges in foreign/second language (L2) writing (FLW/SLW) instruction by leveraging artificial intelligence. The central problem this study addresses is the lack of active learner engagement and the resource-intensive nature of traditional feedback methods, which can lead to teacher burnout and ineffective student learning outcomes. Existing feedback practices often fall short in providing detailed, timely, and comprehensible feedback, which hinders students' ability to critically analyze and act upon it. The study proposes a shift from monologic to dialogic feedback, facilitated by large-language models (LLMs), to promote continuous iterations of editing and rewriting, thus enhancing linguistic and cognitive development. The goal is to reveal the potential of LLMs in facilitating effective dialogic feedback approaches in L2 writing. To achieve this, the study aims to develop a theoretical framework and design principles for AI-enabled dialogic feedback systems, create an AI-writing tool based on this framework, and test its effectiveness through experimental sessions. Ultimately, the study seeks to understand the impact of AI-enhanced feedback on L2 learners' writing progress, their perceptions and experiences, and the emerging interaction patterns during the feedback process. This research holds the potential to transform feedback practices in language learning, contributing to more effective and engaging L2 writing instruction.

## Keywords

foreign language writing, second language, dialogic feedback, artificial intelligence, quality education

## 1. Introduction

Schools, of all levels, are where bi-directional educational transactions, through teaching and learning, take place, ideally leading to the cognitive growth for both teachers and learners [25]. These transactions require teachers and learners to take up on various roles, either as active or passive. While in lecture settings, students generally opt for being the passive receivers of the knowledge, in order to construct it for individual use, active learner engagement is essential. Since traditional monologic teaching is not creating this engagement, since it is either the teacher lecturing, or the teacher or the peer evaluating the performance of a student, it leads to an active learning experience missed [32, 41].

In monologic teaching, even with the growing number of students in large classrooms, teachers spend considerable time in order to carefully construct the feedback for their learners and cater their needs. However, teachers report that their feedback is not read critically or analyzed nor acted upon to reflect the necessary changes in student work. Interestingly, students, on the other hand, also report that there are times when the teacher feedback received is not detailed enough, delivered on time or does not clarify the confused concepts as much as needed, hence the need for the dialogic teaching where meanings and expectations are clarified and negotiated in order to construct the knowledge [1, 26, 32, 41, 46, 56, 57].

Through dialogic teaching, the goal is to reduce the dissatisfaction among teachers and learners. In this way,

the previously “monologued” versions of feedback processes, views on student performances by teachers or peers, are re-conceptualized as dialogic activities, where students are given the chance to discuss the comments in depth, by enlisting the help of “more knowledgeable other” as Vygotsky [48] proposed in his Sociocultural Theory. Writing, as a productive language skill, is where the dialogic feedback is utilized and to benefit most from this educational transaction both for teachers and learners, since the act of negotiation in between is a collaborative meaning making process bound by the shared context [32, 41].

In the language teaching and learning realm, writing is considered as a productive language skill that allows individuals to effectively express their ideas and thoughts [39]. It, as a process, includes iterative and dynamic steps where feedback is instrumental in refining and enhancing the quality of written content. Engagement with feedback is both a threshold and a milestone for learners in terms of improved linguistic and cognitive development [16, 32]. At surface level, while feedback might be regarded as the corrections done, in reality it is a bi-directional complex interaction involving understanding, interpreting and integrating feedback into the work at hand [32, 34]. In traditional settings, feedback received is described as limited while covering multiple aspects at the same time, as a result, it can create a challenge for the students in terms of internalizing and applying to the respective piece of literary work [2]. Since writing in the foreign language requires continuous iterations of editing, rewriting and

polishing, dialogic feedback, encompassing all the mentioned steps, highlights the potential for writing process, both for teachers and learners [32].

While it may sound promising, dialogic feedback in foreign language writing comes with many challenges. Teachers, due to the workload, time constraints and the number of the students in their classes, experience continuous difficulties with providing detailed feedback within a desired timeframe [5]. On one hand, classroom constraints make it exhausting for the teachers to provide regular and meaningful bi-directional feedback to the learners in the format they need. On the other hand, the learners sometimes lack the skills in order to decipher the teacher feedback and get maximum benefit to implement in their written work rather they end up with making mere superficial revisions [15, 57]. As a result of these challenges, there occurs the need for innovative solutions in order to ensure the feedback process is bi-directional and beneficial for both teachers and learners by adopting dialogic feedback for the foreign language writing process [3].

Recent developments with AI offer promising technological and pedagogical advancements with language learning and dialogic teaching. As Brown et al. [4] assert, language learning models (LLMs) such as GPT 4, GPT-4o, Gemini as well as other open-source LLMs such as Llama 3 have the ability to better understand humans, at varying degrees, and thus stand out as powerful tools to improve educational practices. These models can be exploited as powerful tools to provide promptly delivered, context-specific/context-appropriate and detailed feedback to the users while giving them a chance to carry out dialogic interactions. In this way, learners can get the chance to critically analyze the LLM responses, ask follow-up questions and receive responses in real-time [37, 47]. Therefore, LLMs, have a serious potential to transform the feedback processes and improve EFL learners' writing skills [51].

Integrating LLMs with dialogic feedback in foreign language writing classrooms is sure to be a noteworthy challenge to overcome. In traditional language learning settings, students primarily rely on teachers, as the source of information and feedback. In the meantime, when implemented by their teachers effectively, students also realize their own potential as a peer. By utilizing LLMs, or AI supported intelligent systems, students can negotiate the meaning and take active part in their individualized foreign language writing journey. As a result, the AI enhanced classrooms of today and tomorrow are going to be places where collaborative learning environments are fostered, and students become the active creators of knowledge while improving their English language skills with the help of personalized feedback in real-time. In the meantime, teachers will overcome the biggest challenge of

providing rich formative feedback even to the large-sized classes without time constraints. That's why, as pointed out by the previous studies, there is a need for more research where AI is utilized in language classes [6, 11, 17, 18, 19, 37]. Towards this end, this proposed study is an attempt to investigate the intersection of foreign language writing, dialogic feedback and AI for a student-centered learning and technology-enhanced foreign language development.

## 2. Literature Review

### 2.1. Second/Foreign Language Writing

Second/Foreign language writing has become very important in the past few decades due to the potential it offers for the members of the future we are to live in since English has become the lingua franca, a language the whole world speaks or the medium of instruction in order to continue learning and growing. As a result, there has been numerous research studies exploring the various dimensions of writing, as a productive language skill, in terms of teacher and learner experiences as well as iterative feedback process and respective steps [20, 28, 29, 30]. Since teacher feedback on errors and how to correct them is essential in guiding language learners with their written work, it is important to be aware of the mutual interactions in between, and their potential offering a deeper understanding of the process [10, 16].

With the technological advancements applied to language learning, new dimensions and potentials have been discovered. Automated writing evaluation systems, for instance, stand out as the long-awaited tools to offer immediate feedback on surface-level aspects of writing such as grammar, style and coherence, thus in return, providing the teachers the chance, the room and the time to offer help with addressing the concerns raised by the students [35, 53]. While the advantages of AI supported systems look promising, there are still concerns about the quality of feedback provided and their implications for language learning classrooms [7, 42, 50].

As part of the learning process, there are many challenges faced in second/foreign language writing as well, and they can broadly be categorized as linguistic, cognitive and metacognitive and socio-cultural factors. The first barrier, linguistic, is a significant one where students experience problems with the language use in terms of vocabulary, grammar, syntax etc. [21]. While, as Kormos [24] asserts, cognitive and metacognitive challenges are caused by the misallocation of L2 learners' cognitive resources, or lack of them in the target language, learners' ability to produce well-structured texts is also negatively affected due to the lack of metacognitive awareness self-regulation steps of writing (goal setting, self-monitoring and self-

evaluation) [13, 40]. As for the socio-cultural factors, it is the second/foreign language learners' backgrounds, unique educational experiences, cultural values they are brought up with, possibly in L1, and their attitudes formed as a result of all these experiences shape their perceptions about L2 writing and written practices [60]. Addressing all these challenges and their respective dimensions in an intricate way is another challenge on its own and no doubt requires well-thought and well-implemented solutions.

As the core of our existence, social interactions, which improve our cognitive processes, have a tremendous potential in language learning. Collaborative writing tasks done in pairs or groups require students to work together in order to produce results, thus, they encourage learners to get involved in mutual meaning making process as a part of negotiation stage, reflect on their language use, and improve their linguistic and cognitive abilities as a result [44, 45]. As the recent studies highlight, there is still a need for an integrative approach combining social interaction, feedback and technology in second/foreign language writing in order to better understand the quality of such interactions, their shortcomings in order to build more effective systems.

## 2.2. Dialogic Feedback

Dialogic feedback is an interactive and iterative process where the meaning is negotiated between teachers and learners in order to foster deeper learning [32]. Unlike traditional monologic feedback, which lacks engagement and thus one-directional, dialogic feedback creates the room for the learners by encouraging them to actively participate in the feedback process and start discussions with their instructors in order to internalize and apply the feedback to improve their written work [3, 54].

Studies done reveal that dialogic feedback can lead to significant improvements in writing proficiency of second/foreign language learners by increasing their metacognitive awareness and self-regulation skills. It also helps learners to better understand the rationale behind the feedback received, leading to well-understood, thus well-implemented, and -reflected revisions as a proof of improved writing quality. Dialogic feedback, in the meantime, fosters creativity, ownership, and agency of the learners during the process. However, since such meaning making attempts necessitate quite a lot of time, we also face the reality of dialogic feedback being a very time-, resource-, energy-consuming process especially for the teachers with large-classes in traditional language learning settings [9, 31, 32, 54].

Due to its intensive time- and resource-demanding nature, dialogic feedback can greatly benefit from a well-

established theoretical framework, and at this point the framework proposed by Er et al. [8] stands out as the ideal and prominent one in the published literature; the combination of SSRL (socially shared regulation of learning), CoRL (co-regulation of learning) and SL (self-regulation). While Er et al. [8] brings together different dimensions of dialogic feedback into one, each and every step of the framework has been tried and tested before through various studies. SSRL, according to Panadero and Jarvela [36], emphasizes the shared management and regulation of learning activities as a group of learners, thus promoting shared responsibility and collaborative learning among peers. CoRL, on the other hand, involves the joint regulations of the learning activities between teachers and learners revealing as well as highlighting the need of guided interaction and scaffolding in the process [14]. SL, as the narrowest as well as the most vital part of the three-step framework by Er et al. [8], highlights the power and importance of learners' ability to take control of their learning process while encouraging independence by setting individual goals, self-monitoring attempts and self-reflection habits [55]. With the help of the established framework by Er and his colleagues [8], the goal is to align the feedback practices of L2 learners and their developmental needs while promoting an integrated learning experience in their second/foreign language writing journeys.

## 2.3. AI-Enhanced Systems in L2 Writing

Automated writing evaluation (AWE) systems, as AI enhanced tools, have recently become popular with the creative potential they offer in language learning, especially to L2 learners who benefit tremendously from immediate and ubiquitous feedback. Grammarly, an AI supported writing partner, and Criterion, an online writing evaluation service by ETS, Educational Testing Services, utilize machine learning (ML) and natural language processing (NLP) algorithms in order to provide immediate feedback for L2 learners especially on the surface level L2 structures such as grammar, syntax and style [40].

These AI-supported tools serve the vital purpose of relieving the heavy burden on writing teachers, at the least to some extent, with the feedback especially in large classes while supporting learner autonomy in the meantime [12]. Nevertheless, while there is research about the potential of such systems to provide consistent and unbiased feedback, a serious advantage in large classrooms [38], the doubt and debate persists about the pedagogical effectiveness of these algorithms/tools as well as how much they can convey the nuances of the target language during the writing practice. Furthermore, it is difficult to track how much of the feedback received through AWEs align with the instructional goals at the time. That's why, AI enhanced

tools should be a complementary element to human feedback rather than a substitution [53].

## 2.4. AI Chatbots in L2 Writing

As AI has started to find solid places in our lives, AI-enhanced chatbots have become popular and are being used also in language learning to provide interactive and personalized learning experiences through conversation opportunities of real-life scenarios in low-stakes environments [59]. In the context of L2 writing, AI enhanced chatbots like Duolingo, offer the language learners real-time feedback with corrections about grammar and vocabulary of the written work as well as suggestions on how to increase its fluency and accuracy. Since these suggestions will be part of a conversation between the chatbot and the language learner, students will naturally be engaged in writing exercises mimicking real life communication while ensuring the existence of mutual contextual understanding as a result [22, 49]. Despite all the recently reported advantages of AI enhanced chatbots, there is still a need for their effective integration in the L2 writing instructional process.

## 3. Purpose of the Study and Research Questions

The overarching goal of this research is to reveal the potential of large language models in facilitating effective dialogic feedback approaches in L2 writing. In line with this goal, the following objectives are determined:

- To develop a novel theoretical framework for empowering AI-enabled dialogic feedback in second language writing. (Design principles will be derived in order to consider for developing AI systems enabling dialogic feedback writing in L2 writing classrooms).
- To develop an AI-writing tool grounded in the theoretical framework.
- To design and implement experiments to test the effectiveness of the AI-writing tool in real-world practice.
- To understand the effects of the AI-writing tool and students' experiences.

Towards this end, the following research questions will be investigated:

- **RQ1:** What are the effects of AI-enhanced feedback systems on L2 learners' writing progress?
- **RQ2:** What are the perceptions and perspectives of L2 learners and instructors

regarding the use of AI tool and the dialogic feedback process?

- **RQ3:** What are the emerging patterns and profiles in AI-learning interaction during the dialogic feedback enabled by the AI-writing tool?

## 4. Methodology

This study, proposed on May 31, 2024, is planned as design-based research (DBR) since DBR is utilized to inform and improve designs and practices [62] while it will also "directly impact practice while advancing theory that will be of use to others" [61].

Teacher as the researcher will utilize the AI-enhanced tool in her writing classes. To test the effectiveness of the AI-writing tool, four experimental sessions will be carried out, where students will work on improving their writing homework in different feedback conditions. In two of the sessions, the same set of students will use the AI-writing tool and receive feedback in a dialogic manner to improve their work, while in the other two sessions, students will utilize the feedback generated by AI to improve their work (i.e., monologue approach). In all sessions, students will revise their previous submissions but will be exposed to different feedback conditions.

The reason for running two sessions per each condition is to ensure consistency and reliability of the results. By having multiple sessions, a more robust comparison can be achieved between the dialogic and monologue feedback methods, ensuring that the results are not influenced by the distinct characteristics of a single session.

As for the data instruments and analysis, in order to answer RQ1, writing score improvements (pre vs post) will be analyzed through ANCOVA, while knowledge levels are accepted as confounding variable. For RQ2, the results of interviews and open-ended questionnaire will be analyzed through thematic analysis and Epistemic Network Analysis (ENA). In order to find out the emerging patterns and profiles in AI-learner interaction, RQ3, two options are outlined; a) computing engagement indicators (i.e. counts of messages) and machine learning classification or b) coding of the interactions (i.e. comments) and identification of engagement patterns and learner profiles.

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