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The effects of online flipped peer dynamic assessment on EFL learners' academic writing skills

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This study employed an explanatory sequential mixed-methods design to investigate the effects of the Online Flipped Peer Dynamic Assessment (OFPDA) approach on the academic writing skills of English as a foreign language (EFL) learners. 48 EFL learners at an Iranian university participated in the study through convenience sampling. Learners were randomly assigned to either a flipped ($n = 24$) or non-flipped ($n = 24$) group. The two groups followed DIALANG (an online language diagnostic test), including a pre-test, intervention (for the flipped group), conventional teaching (for the non-flipped group), and a post-test. Half of the flipped participants were voluntarily invited for a focus group interview. Data were analyzed using two independent sample t-tests. A micro-genetic development approach was employed to analyze moment-to-moment changes in learners' behaviors during peer interactions, and a thematic analysis approach was also used. The quantitative results showed that the flipped group significantly outperformed the non-flipped group in terms of academic writing skills. In addition, microgenetic development analysis revealed that implementing online peer-graduated and contingent prompts considerably enhanced students' writing performance. The focus group interview findings also revealed that EFL learners had positive attitudes towards OFPDA. These findings have pedagogical implications for policymakers, educators, and teachers, who will

benefit from the affordances of OFPDA, especially in technology-enhanced flipped settings, to improve learners' learning outcomes.

Keywords: Academic writing skills, EFL learners, flipped learning, microgenetic development, OFPDA



Introduction

Driven by Sociocultural Theory (SCT), which posits that learning is a social activity and that all higher mental activities are mediated (Vygotsky, 1978), and the development of mobile-assisted language learning (MALL), flipped learning has become an innovative teaching and learning strategy that attracts language teachers (Fathi & Rahimi, 2020; Vitta & Al-Hoorie, 2020). In its broadest sense, flipped learning reverses how instruction is delivered, allowing learners to receive instructional content before class. The instructor's guidance provides ample opportunities for students to participate in problem-solving and cooperative learning activities during class (Zou et al., 2020). With the rapid development of MALL, flipped learning has become increasingly effective, enabling learners to engage in language learning at any time and from anywhere (Ebadi & Bashiri, 2021) and promoting learner-centered and interactive approaches (Andujar & Nadif, 2020). Students can engage in language-learning materials and activities on their mobile devices outside class, preparing themselves for in-class activities that focus on practice, discussion, and language applications (Zhao & Yang, 2023).

Computer-Assisted Language Learning (CALL) research has shown the effectiveness of using flipped learning in developing writing skills (e.g., Huang et al., 2024), promoting learners' autonomy (Behforouz & Al Ghaithi, 2025), learners' motivation (Mirzaei et al., 2022), promoting a student-centered approach (Andujar & Nadif, 2020), and increasing learners' interaction through self- and peer-assessment (Velayati, 2023). Despite these promising findings, other studies have reported notable challenges, including teachers' unavailability, difficulties in understanding pre-class activities (Alghasab, 2020), and the absence of immediate feedback from teachers or peers (Aghaei et al., 2019; Lee & Martin, 2020). Some researchers argued that simply adding video clips to a course may not effectively engage students in language learning activities (Nicholes, 2020), while others emphasized the integration of a social mediator, i.e., a more capable person (peer/instructor) in pre-class activities to guide learners in reaching the course goals (Lee & Wallace, 2018; Rezaei et al., 2022).

Online Flipped Peer Dynamic Assessment (OFPDA), a developed flipped learning strategy integrating learners' sole interaction with online materials and active engagement in peer dynamic assessment, significantly enhanced EFL learners' reading comprehension skills with sustained retention while fostering reduced anxiety, increased autonomy, and motivation through peer-mediated interactions via WhatsApp and Adobe Connect. However, challenges such as internet connectivity arose (Velayati, 2023).

Although previous studies (e.g., Fathi & Rahimi, 2020; Zhao & Yang, 2023)

have highlighted the benefits of flipped classrooms for language learning, research has not yet fully explored how combining flipped classroom dynamics with MALL influences EFL learners' writing skills. Indeed, reviewing the current literature on flipped classrooms and MALL has shown that despite the growing interest in both topics, little research has focused on their combined effect on EFL learners' writing skills, particularly in contexts where learners struggle with academic writing. For instance, limited research has investigated the Iranian context where English is taught as a foreign language (FL) and in which learners encounter challenges and obstacles, particularly in writing (Mirzaei et al., 2022; Shooli et al., 2022). These challenges often stem from a traditional pedagogical focus on grammar-translation methods, which provide limited practice for developing productive writing skills. Consequently, learners often struggle with generating ideas, organizing arguments coherently, and mastering the rhetorical conventions of academic English. This context highlights the pressing need for innovative, learner-centered approaches, such as OFPDA, to foster the development of academic writing proficiency. Rooted in SCT and the Zone of Proximal Development (ZPD) principle, this study employs OFPDA to provide graduated and contingent support, hypothesizing that such an approach will effectively enhance EFL learners' writing skills by aligning them with their developmental needs.

The findings of this study have the potential to significantly contribute to EFL pedagogy by providing empirical evidence on the effectiveness of integrating OFPDA with MALL in improving learners' writing skills, thereby guiding future instructional practices. Hence, concerning the mentioned lacunas and the growing call for merging peer dynamic assessment (PDA) into online flipped classrooms, this study aims to investigate the effects of integrating OFPDA with MALL on the writing skills of EFL learners. Specifically, it seeks to answer the following questions:

1. To what extent does online flipped peer dynamic assessment enhance EFL learners' writing skills?
2. How does OFPDA improve EFL learners' writing skills?
3. What are the learners' attitudes toward online flipped peer dynamic assessment?

Literature review

Sociocultural theory (SCT) and flipped learning

SCT highlights the interrelatedness between social interactions and an individual's cognitive development (Donato 2000; Lantolf 2000). According to Vygotsky (1987), learning is a social activity, and all higher mental activities are mediated (Lantolf, 2000). Mediation refers to "the process through which humans deploy culturally constructed artefacts, concepts, and activities to regulate (i.e., gain voluntary control over and transform) the material world or their own and each other's social mental activity" (Lantolf & Thorne, 2006, p. 79). Lantolf (2000) elucidated that mediation can occur between the teacher and students or

amongst students themselves (i.e., social mediation) and in the form of artifact mediation (e.g., language or technology).

From the SCT perspective, learning occurs between individuals through culturally organized social activity (Kaufman, 2004; Mitchell & Myles, 2004). This culturally organized social activity could be a writing task in which learners interact with one another (i.e., social mediation) and provide peer feedback on each other's writing skills (De Guerrero & Villamil, 2000). This allows learning to occur in sequence, with knowledge initially emerging in social interaction with others (the inter-mental plane) and later being internalized individually (the intra-mental plane) (Lantolf & Thorne, 2006). In this process, the concept of the ZPD provides a framework for understanding how social interaction facilitates cognitive growth. The ZPD delineates the difference between what a child can do individually (i.e., their current ability) and what they can perform with assistance from other mediators such as parents, teachers, peers, or cultural tools (i.e., their potential ability) (Vygotsky, 1978). However, Holzman (2018) emphasizes that the ZPD should not be understood as a fixed zone or distance, but rather as a dynamic activity collaboratively created through the interactions of people. The dynamic activity provided to a learner within the ZPD is known as scaffolding (Wood & Middleton, 1975). It is a specific educational approach within pedagogy that ensures learners receive sufficient support in their learning process, aiding them in bridging the gaps between their existing knowledge and unfamiliar course content (Green, 2015). While scaffolding is primarily understood as a pedagogical practice for offering instructional support, DA constitutes a more comprehensive assessment framework in which such support is integrated formally into the assessment process, reflecting learners' current abilities and their responsiveness to mediated intervention (Elliott, 2003). From SCT's vision, interaction in language learning contexts is effective when it includes a collaborative talk (Swain, 2000), i.e., students use language to articulate their partial knowledge about the target language. This knowledge is shared with others who engage in languaging by questioning the articulated knowledge of language, proposing alternatives to repair it, and potentially building on it to construct new knowledge.

Flipped learning and OFPDA are linked to the principles of SCT theory because they provide artefacts and social mediation. That is, flipped learning provides learners with artefact mediation, i.e., online pre-classroom materials including pre-recorded videos, screencasts, podcasts/vodcasts, annotated notes (O'Flaherty & Phillips, 2015), and social media audio or videos (Zhao and Yang, 2023). Additionally, OFPDA also offers opportunities for social mediation. In the online flipped peer dynamic assessment context, ZPD is realized through peer collaborative interaction. It can be implemented through various means such as peer feedback, collaborative discussions, and shared resources. Social mediation, particularly in writing, is significant (De Guerrero & Villamil, 2000). Peer interaction played a crucial role in facilitating language development, as learners provided constructive feedback, clarified linguistic misunderstandings, and modelled appropriate language use (Hyland & Hyland, 2006). Through these collaborative processes, students enhance their linguistic competencies,

demonstrating the effectiveness of peer-mediated scaffolding in second language acquisition. By incorporating ZPD-based scaffolding into a flipped learning environment, OFPDA ensures that students receive timely and context-sensitive mediation from their peers, thereby compensating for the lack of immediate instructor feedback in traditional flipped models (Velayati, 2023).

The rapid development of MALL has facilitated the implementation of flipped learning and OFPDA. Nowadays, students are digital natives who have access to mobile technologies anytime, anywhere (Alamer et al., 2023). MALL encompasses any educational experience facilitated through telecommunication technologies such as smartphones, personal digital assistants, and tablets, which are well-suited for informal out-of-class learning (García Botero et al., 2018). In a flipped language classroom using MALL, students can engage with language learning materials and activities on their mobile devices outside of class, preparing themselves for in-class activities that focus on practice, discussion, and language applications (Zhao & Yang, 2023). The connection between flipped classrooms and MALL lies in their shared goal of enhancing the learning experience by leveraging technology and promoting learner-centered and interactive approaches (Andujar & Nadif, 2020). Despite this connection, little research has focused on their combined effect on EFL learners' writing skills, particularly in contexts where learners struggle with academic writing. The following section will discuss how OFPDA extends flipped learning by incorporating the social dimension and present empirical studies that examine the impact of flipped learning on the development of writing skills in a language learning context, with a special reference to OFPDA.

Flipped learning and OFPDA

Despite its effectiveness as a learning strategy, flipped learning has some drawbacks, including the absence of immediate instructor feedback, difficulties in comprehending pre-class materials without teacher guidance, and challenges related to student engagement and self-regulation (Aghaei et al., 2019; Lee & Martin, 2020). Additionally, students may struggle with understanding complex linguistic concepts without real-time scaffolding, which is crucial for effective second language acquisition (Nguyen & Williams, 2019). Given these challenges, exploring alternative instructional approaches that mitigate these limitations while preserving the benefits of flipped learning is critical.

One such approach is OFPDA (Velayati, 2023), which integrates principles of Dynamic Assessment (DA) with the flipped learning paradigm to enhance peer feedback and collaborative learning opportunities. Rooted in Vygotsky's SCT, DA is an approach that integrates instruction with assessment (Poehner, 2008). However, other forms of DA present certain limitations. For example, traditional one-on-one DA is constrained by the limited number of participants (Estaji & Farahanynia, 2019), group dynamic assessment (GDA) can restrict the inclusion of multiple constructs (Yousefi et al., 2024), and computerized dynamic assessment (CDA), despite its utility in areas like reading proficiency (Yang & Qian, 2020), can lack high-quality, ZPD-based mediation (Estrada-Araoz

et al., 2023). In contrast, OFPDA leverages peer collaboration and interactive technologies to overcome these challenges, facilitating a more inclusive and responsive learning environment (Kreis et al., 2024). The OFPDA can enhance peer feedback and collaboration by providing students with a more flexible, engaging, interactive, and data-driven learning environment (Rezaei et al., 2022). Recent research in technology-mediated DA also highlights its potential to foster learner self-regulation (Udeshinee et al., 2024). This can empower students to participate actively in their learning processes and foster community and peer collaboration. Regarding the robust underpinnings of the flipped model, OFPDA must be explored as a new approach in the L2 context (Velayati, 2023). While existing research on flipped writing classrooms has demonstrated the efficacy of collaborative scaffolding and technology-mediated feedback (Wang, 2023), few studies have specifically explored the integration of Online Flipped Peer Dynamic Assessment (OFPDA) in developing L2 writing skills, a gap this study addresses by examining OFPDA's potential to systematize peer-mediated dynamic assessment within writing pedagogy, as further contextualized in the following empirical review.

Studies on flipped writing classrooms

Empirical research has reported that implementing flipped learning principles resulted in favorable findings including boosting L2 writing skills (Wu et al., 2019), increasing motivation and self-efficacy (Su Ping et al., 2020), developing teamwork skills (Huang et al., 2024), broadening writing organization and use (Fathi et al., 2022) and enhancing learners' autonomy (Challob, 2021).

Relevant to the current study, some studies adopted a quasi-experimental research design to examine the impact of flipped learning on the development of writing skills, specifically focusing on complexity, accuracy, and fluency (e.g., Adhami & Taghizadeh, 2022; Fathi & Rahimi, 2020; Zhao & Yang, 2023; Wu et al., 2019). Fathi and Rahimi's (2020) comparative study revealed that flipped instruction significantly outperformed traditional methods in developing EFL learners' global writing proficiency and fluency, underscoring the approach's capacity to optimize practice time and scaffolded feedback cycles. These findings align with broader evidence that flipped methodologies prioritize active, student-centered learning, a critical advantage in writing pedagogy where iterative refinement and autonomy are paramount (Behforouz & Al Ghaithi, 2025). Research on technology-enhanced flipped writing instruction consistently demonstrates its dual capacity to improve L2 writing outcomes while mitigating learner anxiety. Zhao and Yang's (2023) study illustrates this dual benefit, revealing that social media-supported flipped methodologies enhance writing performance and reduce anxiety, a critical advancement over traditional teacher-centered approaches. Despite these remarkable findings, Fathi and Rahimi (2020) found that there was no significant impact of flipped learning on the complexity and accuracy of students' writing, suggesting potential limitations in the task design and the extent to which pre-class instructional videos provided sufficient cognitive engagement for more advanced writing

skills. Cengiz and Ataşb's (2024) study identifies time management as a key challenge in online self-regulation, contrasting with learners' strong capacity to structure distraction-free digital environments. It reveals that co-regulation positively correlates with goal setting and self-evaluation. These findings demonstrate how collaborative tasks reinforce metacognitive growth and illustrate learners' strategic use of peer networks, digital resources, and adaptive practices, such as note-taking, to bridge individual autonomy and collaborative scaffolding in L2 writing development.

Reviewing the literature indicated that while the flipped approach shows promise in improving writing skills, its limitations in fostering more complex writing skills necessitate further investigation into how interactive and scaffolded learning activities could be integrated into the pre-class phase. This is proven in Ariani et al. (2024) and Behforouz and Al Ghaithi (2025). Their finding suggests that integrating technology-based learning strategies within a flipped framework can enhance learners' writing skills, engagement and autonomy. Lee and Martin (2020) and Aghaei et al. (2019) supported this claim by stating that the lack of immediate teacher or peer feedback during pre-class video learning could hinder comprehension and engagement, leading to potential frustration among learners, particularly those relying on real-time clarification. This concern highlights a possible drawback of the flipped model when applied to writing instruction, as effective writing development often requires iterative feedback and guided practice rather than passive content consumption.

Methodology

Design

This study employed an explanatory sequential mixed-methods design integrating quantitative and qualitative data sources. This design enabled researchers to thoroughly understand the quantitative findings by conducting detailed qualitative data analysis (Riazi, 2016). Quantitative data were collected through the pre-test, intervention, and post-test procedures of two groups, while qualitative data were obtained through a focus group interview and a microgenetic development approach. The microgenetic development approach rooted in Vygotsky's (1986) genetic law of cultural development provides a novel approach to studying the mind by enabling a detailed examination of moment-to-moment changes in learners' behavior, which are integral to understanding development within the SCT framework. Therefore, the present study aimed to investigate the effects of OFPDA on enhancing the academic writing skills of EFL learners, both quantitatively and qualitatively.

Setting and participants

Using a convenience sampling method (Dörnyei, 2007), 48 Bachelor of Arts (B.A.) EFL students studying TEFL were selected from an Iranian university.

These first-year students had no prior exposure to flipped classrooms. While the students had experienced online learning during the COVID-19 pandemic, this primarily consisted of emergency remote teaching rather than the systematic pedagogical model of an actual flipped classroom, which requires a deliberate and resource-intensive instructional design with which the participants were unfamiliar. The participants were selected using convenience sampling based on their enrollment in the same academic program, availability prior to proficiency testing, and willingness to participate. Given the homogeneous nature of the target population (EFL learners at Iranian universities), findings are expected to mirror those from a random sample. Participants' proficiency was assessed with DIALANG, an online diagnostic system (<https://dialangweb.lancaster.ac.uk/>), showing that all 48 had a B1 Common European Framework of Reference for Languages (CEFR) level. This uniform proficiency level is considered plausible given that the participants shared a similar educational background as first-year students in the same department. Participants included 21 males and 27 females, aged 19 to 25, native Persian speakers. They were randomly divided into flipped (N = 24) and non-flipped (N = 24) groups. Ethical compliance was ensured by consulting the Department of English and Literature head and the writing course instructor. Participants signed a consent form in Persian, which was sent via WhatsApp or email, ensuring confidentiality and the research-only use of their data.

Research instruments and materials

IELTS writing tests and coursebook

This study employed two writing tests: a pre-test and a post-test, with the pre-test assessing learners' writing skills before the intervention and the post-test measuring the impact of OFPDA on their writing development. Two recent International English Language Testing System (IELTS) academic writing tasks 1 and 2 were selected for both assessments to ensure standardized, authentic tasks aligned with the study's objectives. The IELTS academic writing test was chosen because of its reliability and validity in assessing writing proficiency in academic contexts. Collins Writing for IELTS, developed by Williams (2011), was selected as the primary source for writing tasks in both groups' instructional sessions, providing structured guidance, model responses, and skill-building exercises. An example of a Task 1 writing practice activity is included in Appendix A. To maintain methodological rigor, identical course book content was used in both flipped and non-flipped classrooms, ensuring comparable instructional materials. This consistency helped control for extraneous variables, ensuring that the observed differences in writing performance could be attributed to the instructional approach rather than content exposure discrepancies. By employing standardized IELTS writing tasks and a recognized IELTS preparation resource, the study ensured pedagogical relevance and internal validity, allowing the evaluation of OFPDA's impact on learners' academic writing development.

Peer interaction recordings

The primary data collection instrument for the second research question was recording the students' synchronous peer interactions. All pre-class OFPDA sessions, conducted on Google Meet, were video-recorded with the participants' consent. These recordings captured the complete spoken dialogue, screen sharing of the written essays, and any accompanying text-based chat, providing a rich, moment-to-moment record of the peer mediation process for subsequent microgenetic analysis.

Focus group interview

In this study, a focus group interview was employed as an additional data collection instrument. Twelve learners, constituting one-half of the flipped group, were randomly chosen to participate in a Google Meet video conference. During this session, they deliberated on their perceptions of the OFPDA's impact on enhancing their writing skills. The third researcher moderated the discussion, encouraging learners to articulate how OFPDA affected their writing abilities. The interviews were conducted in Persian, the learners' native language, to prevent misinterpretation. Subsequently, it was recorded, transcribed, and translated into English for further analysis. A rigorous verification process was employed to ensure the accuracy and fidelity of the translation. The initial translation from Persian to English was performed by the third researcher, who is bilingual. An independent bilingual expert in applied linguistics then reviewed the English transcripts against the original Persian transcripts to verify accuracy. Any discrepancies were discussed until a consensus was reached on the final version. It is important to note that the focus group interviews took place after the intervention sessions and lasted for approximately two hours.

Google Meet application

The Google Meet application is considered a safe environment for learners and teachers attending online courses (Al-Marroof et al., 2023). As Al-Marroof et al. (2023) stated, this safe location has certain advantages over other interactive applications, including easy installation on smartphones and laptops, the ability to use one link multiple times, and stress-relieving and uncluttered features. It also supports high-quality video conferencing, allowing students to participate in live video interactions.

Data collection procedure

The data collection procedures are outlined below, detailing the steps taken to implement the intervention and assess learners' writing skills throughout the study (See Figure 1).

Preparation phase

Before initiating the intervention, the researchers ensured all students had installed the Google Meet application on their mobile devices or personal computers. The DIALANG online diagnostic system (<https://dialangweb.lancaster.ac.uk/>) was employed during the first session to evaluate student homogeneity. Specifically, this test was used to ascertain the participants' general language proficiency based on the CEFR scale, ensuring they all belonged to the same broad proficiency band (B1). This served a different purpose than the pre-test, which later measured the baseline of the specific academic writing skill. Both instruments provided a more rigorous confirmation of the groups' equivalence regarding general ability and the specific dependent variable. The DIALANG results, based on the CEFR ranging from A1 to C2 proficiency levels, indicated that 48 students were at the B1 level, ensuring a relatively homogeneous sample.

Orientation to OFPDA

During the second and third sessions via Google Meet, the teacher (the third researcher) introduced the OFPDA and provided detailed instructions on how learners could utilize it to enhance their writing skills. The instructor used PowerPoint slides to outline the implementation steps, emphasizing key aspects such as dialogic, contingent, and graduated feedback and fostering a respectful mediation process. DA is broadly categorized into two models of interventionist and interactionist. Interventionist DA typically relies on standardized, predetermined mediations. In contrast, the interactionist approach emphasizes that mediation should be negotiated dialogically and tailored to the learner's specific needs as they emerge in the interaction (Poehner, 2008). Given this study's focus on collaborative peer learning, it adapted the interactionist approach to DA (Poehner, 2009), as mediations were negotiated rather than predetermined. To facilitate structured peer mediation, the researchers introduced three regulatory scales (Aljaafreh & Lantolf, 1994; Davin & Donato, 2013; Poehner et al., 2015) that rank mediation typologies from least explicit to most explicit. These specific scales were chosen for their foundational and pedagogical value. The Aljaafreh and Lantolf (1994) scale is a seminal framework for microgenetic and dialogic mediation. The subsequent scales were presented to show learners how this framework has been adapted for collaborative group contexts (Davin & Donato, 2013) and computer-mediated environments (Poehner et al., 2015). This selection provided students with a comprehensive toolkit for providing peer feedback that was directly relevant to the online, collaborative nature of OFPDA. Students were not instructed to select and adhere to a single scale; instead, they were encouraged to use the scales as a flexible guide to inform their dialogic mediation, applying the principles of graduated support interchangeably as best suited the context of their peer interactions. This approach helped students provide graduated, contingent, and dialogic mediation, supporting peer collaboration in the development of essential writing skills. The orientation was efficient, ensuring that participants

could apply these principles effectively. Following the explanation of the scales, the instructor modelled the mediation process and had students engage in a brief, guided practice session. Furthermore, a crucial component for ensuring the fidelity of the intervention was the continuous monitoring of the peer interactions. As part of the procedure, learners were required to record every pre-class OFPDA session and submit it to the second researcher for review. This regular review enabled the researcher to verify that students were accurately applying the principles of graduated and contingent mediation as outlined in the scales, providing a mechanism for ongoing quality control throughout the intervention phase. It should be noted that not all interactions were flawless. Particularly in the initial weeks, some students struggled to provide appropriately graduated prompts or offered inaccurate feedback. The researcher's review process was instrumental in identifying these instances. While direct intervention was minimized to foster peer autonomy, the researcher provided brief guidance to dyads if significant issues persisted. Therefore, the excerpt chosen for the results section is a representative example of a successful interaction that illustrates the OFPDA mechanism functioning as intended.

Pre-test administration

In session 4, a pre-test was conducted using recent IELTS Academic Writing Tasks 1 and 2 to assess students' initial writing proficiency before the intervention.

Intervention phase

The intervention lasted eight weeks, comprising seventy-five-minute sessions conducted twice weekly (Sessions 5 to 20).

flipped group procedures

Learners in the flipped group engaged in both pre-class and in-class activities. The pre-class phase was conducted entirely through MALL principles, where learners used their personal devices (e.g., smartphones, laptops) to complete the required tasks outside the classroom.

Pre-class activities

- Students watched pre-recorded instructional videos (sourced from YouTube and online courses) on writing strategies before attending class.
- The videos varied in length, ranging from 8 to 20 minutes.
- Students participated in two-member Google Meet sessions, where they exchanged spoken and written mediation, collaboratively addressed writing challenges, and applied graduated, contingent, and dialogic mediation strategies.

- Each OFPDA session was recorded and submitted to a third researcher for review.

In-class activities

- Checking coursebook practices (10 minutes).
- Assessing video content comprehension through guided discussions (10 minutes).
- Applying principles from the pre-class videos by collaboratively completing scaffolded writing tasks from the coursebook (e.g., outlining, sentence construction, paragraph development), and analyzing model reading passages from the book to understand genre and structure (45 minutes).
- Introduction to the next session's topic (10 minutes).

Notably, learners in the flipped group did not receive after-class assignments but were expected to engage in OFPDA and video lectures as preparation for the next session.

Non-flipped group procedures

Learners in the non-flipped group covered the same content but without videos or OFPDA. Instead, their learning was structured as follows:

In-class activities

- Lecture-based instruction using PowerPoint slides and teacher-led explanations (30 minutes).
- Collaboratively completing writing tasks from the coursebook (e.g., outlining, sentence construction, paragraph development), and analyzing model reading passages from the book to understand genre and structure (35 minutes).
- Introduction to the next session's topic (10 minutes).

Unlike the flipped group, the non-flipped group received homework assignments based on coursebook tasks. Still, it did not engage in pre-class activities such as watching instructional videos or conducting OFPDA.

Maintaining participant engagement and motivation

Sustaining student engagement was a key consideration in the study's design. Rather than using external incentives, motivation was fostered through features inherent to the OFPDA process. First, the instructor established a respectful and supportive environment for peer mediation during the orientation. Second, the flipped design promoted autonomy and preparation, allowing students to learn at their own pace, which reduced frustration and increased

their readiness for in-class tasks. Third, the structure of graduated peer feedback was designed to enhance learner self-efficacy and confidence. Finally, the requirement for students to record and submit their OFPDA sessions for researcher review was a consistent accountability mechanism that encouraged sustained engagement throughout the intervention.

Assessment and post-test

To track participants' Zone of Proximal Development (ZPD), IELTS Academic Writing Tasks 1 and 2 were administered at multiple stages. Task 1 required participants to describe graphical data (e.g., bar charts, diagrams, line graphs) in a minimum of 150 words within 20 minutes (University of Cambridge ESOL Examinations, 2011). Task 2 involved composing a 250-word response to an argument or problem within a 40-minute time frame. The writing tasks were selected based on Collins Writing for IELTS to ensure alignment with the study objectives.

In Session 21, a post-test was administered using recent IELTS Academic Writing Tasks 1 and 2 to assess students' writing progress after the intervention. Two trained independent raters evaluated both pre- and post-test essays using the IELTS scoring rubric, focusing on (1) task achievement, (2) coherence and cohesion, (3) lexical resources, and (4) grammatical range and accuracy.

Each category was rated on a 1–9 scale, with Task 1 contributing 30% and Task 2 contributing 60% of the total score (University of Cambridge ESOL Examinations, 2011). To ensure inter-rater reliability, a second trained rater evaluated 50% of the essays, yielding a Cohen's kappa reliability index of 0.82, indicating satisfactory agreement.

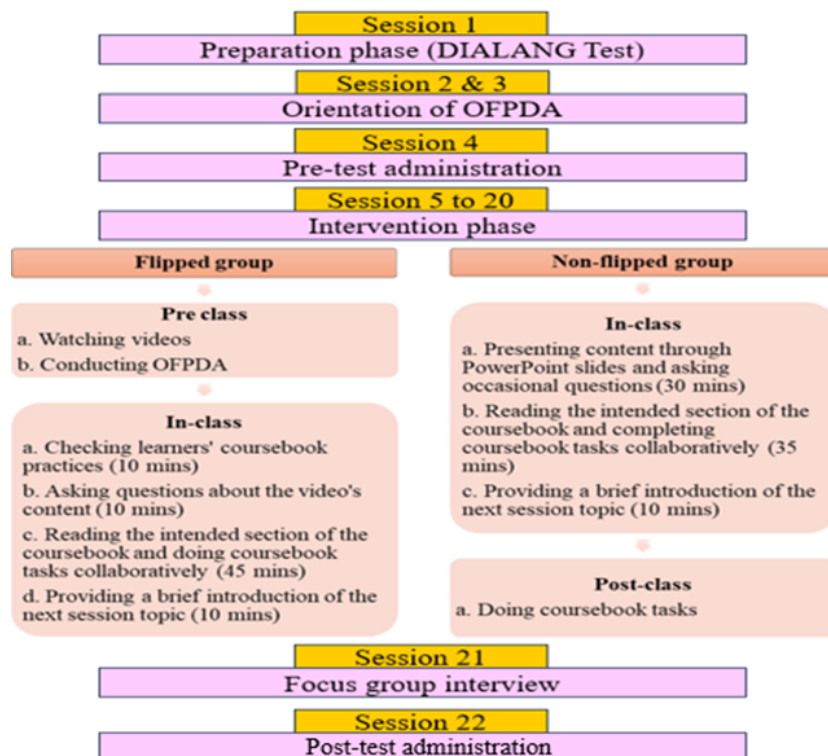


Figure 1. Data collection procedure

Data analysis

This study used a mixed-methods approach to collect and analyze quantitative and qualitative data. To address the first research question, independent sample t-tests were employed to compare results between the two groups (Dörnyei, 2007).

For the second research question, a microgenetic approach was employed to analyze the development of learners' writing performance (Ellis & Barkhuizen, 2005). This approach, rooted in Vygotsky's (1986) SCT, enables a detailed, moment-to-moment analysis of the learning process. This study employed a meticulous approach by analyzing the recorded spoken and written interactions between peer dyads during their OFPDA sessions. We tracked the progression of mediation from implicit to explicit prompts across various IELTS writing criteria. By examining these detailed peer exchanges, such as the one between 'Tina' and 'Reza' presented in the results, we aimed to observe and understand precisely how peer mediation facilitated the internalization of new writing skills in real-time. While comprehensive microgenetic studies can investigate multiple dimensions of cognitive change (e.g., rate, breadth, variability), the qualitative focus of our analysis was primarily on tracing the path of development and identifying the source of change (i.e., the peer mediator) within the interaction. Peer debriefing enhances the credibility of the analysis

(Flick, 2018). Two external experts reviewed the analytical processes and interpretations. Their feedback helped identify biases and ensure sound findings. Microgenetic analysis revealed how OFPDA enabled students to leverage mediations to shape and internalize intended linguistic structures collaboratively. This approach aimed to uncover how peer mediation facilitated mastery of issues related to writing skills.

Regarding the third research question, a focus group interview explored learners' attitudes towards OFPDA. The thematic analysis was conducted using the transcribed interviews (Lochmiller, 2021). Data analysis followed a reiterative, bottom-up process, employing inductive thematic coding. Emerging themes were organized based on relevance to the research question. To ensure inter-coder reliability, one researcher and an experienced EFL coder randomly selected 50% of the data units and coded them twice. The reliability of the coding was assessed, resulting in an 81% agreement. Cohen's Kappa yielded a coefficient of .92, confirming coding consistency. Thematic analysis involved structured coding, where key themes were identified and refined during axial coding. In selective coding, participants' attitudes were categorized according to established themes. Consequently, a member-checking technique (Creswell, 2007) validated the credibility of participants' responses by sharing transcribed interviews for review and potential adjustments.

Results

Quantitative results

Two independent sample t-tests were conducted to evaluate whether OFPDA helped EFL learners improve their academic writing skills. Table 1 reveals that there was no notable difference in the pre-test scores between the flipped and non-flipped groups ($p = .62$). This result is consistent with the findings of the DIALANG test, which showed homogeneity of the two groups.

Table 1. Independent sample T-tests on Pretest and Post-test

Test	Group	N	Mean	Std.	Sig. (2-tailed)	Effect size (Cohen's d)
Pretest	Flipped	24	4.31	1.22	.62	
	Non-flipped	24	4.50	1.38		
Post-test	Flipped	24	6.02	1.13	.001	0.81
	Non-flipped	24	5.10	1.15		

A second independent sample t-test was conducted to determine if there were any differences in post-test scores between the flipped and non-flipped groups. As illustrated in Table 1, a significant difference was observed between the two groups ($p = .00$). Essentially, the use of OFPDA led to a notable enhancement in academic writing skills for the flipped group ($M = 6.02$) compared to

the non-flipped group, which received instruction through a teacher-driven approach ($M = 5.10$). Additionally, the effect size between the post-test scores of the two groups, as measured by Cohen's d , was $d = 0.81$, indicating a significant effect.

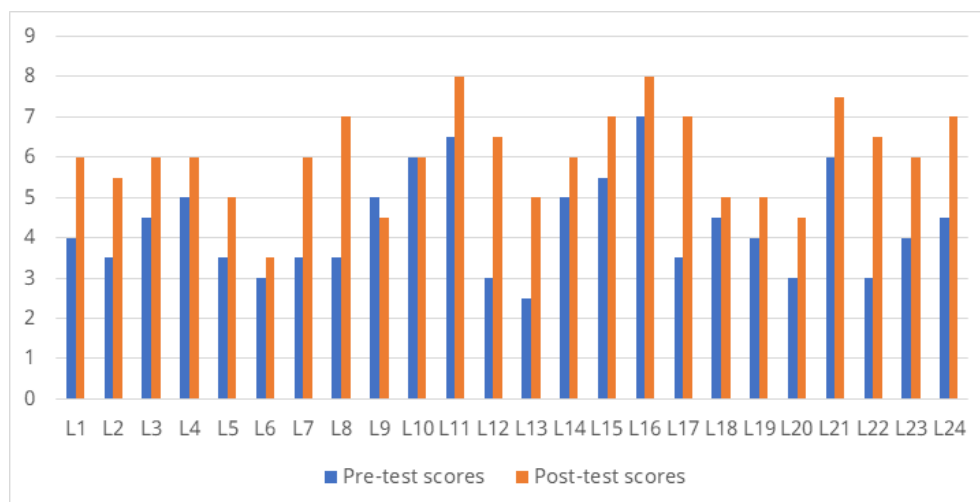


Figure 2. Comparison between the flipped group learners' scores in the pretest and post-test

As depicted in Figure 2, almost all learners in the flipped group achieved higher scores on post-test writing after the intervention sessions than before. For instance, Learner No. 1 (L1) obtained four marks on the pre-test writing task and six on the post-test writing task. This indicates a two-mark enhancement in this learner's academic writing skills from pre-test to post-test based on IELTS writing band descriptors (See Figure 2).

Qualitative results

Results of microgenetic analysis. The second research question investigated how OFPDA improves EFL learners' writing skills, particularly in written and spoken interactions between peers, through microgenetic development aimed at tracking changes in learners' writing skills. While multiple peer interactions were analyzed, this section presents a detailed microgenetic analysis of a single excerpt chosen for its illustrative richness and because it is highly representative of the mediational patterns observed across the larger dataset. Due to space limitations, we were unable to provide more excerpts; however, a thorough analysis of a representative case is more illustrative of the mechanism than a superficial overview of several. Under Tina and Reza's pseudonym exchange mediation, the two learners were based on OFPDA principles. Due to the two learners' written and spoken exchanges on various writing criteria (i.e., task achievement/task response, coherence and cohesion, lexical resources, and grammatical range and accuracy), the prompts were presented numerically, from the most implicit to the most explicit, for each criterion. Figure 3 shows the essays shared between the two learners on Google Meet.

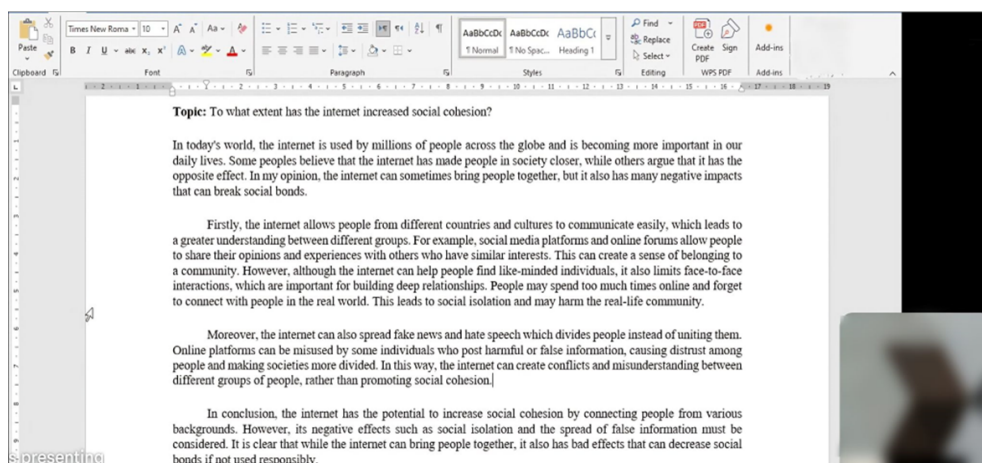


Figure 3. Screenshot of a shared essay between two learners on the Google Meet platform

The following is the transcribed excerpt of the peer exchange between ‘Tina’ and ‘Reza’:

- (1) Tina: This is my essay Task 2, titled ‘To what extent has the Internet increased social cohesion?’
- (2) Reza: That’s great. Tina! Are you ready to work on them?
- (3) Tina: Sure! Let’s get started.
- (4) Reza: I realized some grammatical errors in the introduction and body of the essay. (Grammar prompt 1)
- (5) Tina: Let me see. That’s it. The first is ‘some people.’ I must use some people instead.
- (6) Reza: You hit the bull’s eyes. What about the second question? (Grammar prompt 2)
- (7) Tina: I am searching for it. I cannot find it. Please help me.
- (8) Reza: Sure! This is described in the second paragraph below. (Grammar prompt 3)
- (9) Tina: I can’t find it.
- (10) Reza: Focusing on the last two sentences. (Grammar prompt 4)
- (11) Tina: I do not know why I cannot find it.
- (12) Reza: Spends too much (Grammar prompt 5)
- (13) Tina: Spending too much time online.
- (14) Reza: That is, it. The last grammatical error was in the last sentence of the third paragraph. (Grammar prompt 6)
- (15) Tina: Conflicts and misunderstandings Correct?

(16) Reza: Absolutely.

(17) Reza: Now let us focus on lexical issues.

(18) Tina: I'm ready.

(19) Reza: In the conclusion paragraph, you can use another term instead of the one you have used. (Lexical prompt 1)

(20) Tina: Can I use adverse effects instead of negative effects?

(21) Reza: Definitely! However, I wanted to guide you on a similar term in the last sentence of the Conclusion paragraph. (Lexical prompt 2)

(22) Tina: Do you mean bad effects?

(23) Reza: Yep! (Lexical prompt 3)

(24) Tina: I can change this to negative effects.

(25) Reza: Sure! However, we think of a different word instead of effects. (Lexical prompt 4)

(26) Tina: Consequences or impacts?

(27) Reza: Both are great, but I prefer the first.

(28) Tina: I do agree.

(29) Reza: I have added another word in the third paragraph. (Lexical prompt 5)

(30) Tina: Let me see. I can't find it out.

(31) Reza: What is the opposite of the real or genuine? (Lexical prompt 6)

(32) Tina: You mean fake news?

(33) Reza: That's it. (Lexical prompt 7)

(34) Tina: I think unreliable news is a better option.

(35) Reza: I agree.

(36) Tina: What are cohesion and coherence issues?

(37) Reza: I cannot provide professional mediation on coherence and cohesion issues. Let us correct the possible errors.

(38) Tina: That's a good idea.

(39) Reza: I think the pronoun 'this' in line 3 of the second paragraph is somewhat vague.

(40) Tina: I think so. What are your suggestions? (Coherence and cohesion prompts: 1).

(41) Reza: I do not have any idea right now.

(42) Tina: Can you give me another term? (Coherence and cohesion prompt 2).

(43) Reza: To be honest, no.

(44) Tina: The term 'such platforms' is an appropriate option. Isn't it? (Note: Tina sends this sentence to the chatbox) (coherence and cohesion prompts 3)

(45) Reza: I guess so.

(46) Tina: What are the task responses?

(47) Reza: Please focus on the second paragraph. (Task response prompt: 1).

(47) Tina: I can't get the point.

(48) Reza: Focusing on the last sentence of the paragraph. (Task response prompt: 2).

(49) Tina: So I became confused. I do not know where the problem lies.

(50) Reza: You can elaborate more on the impact of social isolation on real-life relationships. (Task response prompt: 2).

(51) Tina: So, based on your clarification, introducing a related sentence would make it more fruitful. Sentences such as 'social isolation may cause a decline in community gatherings and weakening family ties. (Note: Tina sends this sentence to the chatbox.)

(52) Reza: That's a good move.

In the excerpt above, to microgenetically analyze the interactions between Reza and Tina, the researchers focused on the progression of their mediated exchanges and tracked how Tina's writing skills developed through Reza's assistance. Reza identifies grammatical errors in the introduction and body of the essay (Turn 4). This prompt was intentionally vague, requiring Tina to review the text critically and independently search for errors. This places the task just beyond Tina's current abilities but within her Zone of Proximal Development (ZPD). Tina identified the error in 'some people' and corrected it to 'some people' (Turn 5). Tina's successful correction revealed that this aspect of grammar was closer to the boundary of her ZPD and required implicit mediation. Reza provided increasingly specific hints to guide Tina to the following errors: For instance: "It's in the second paragraph" (Turn 8), "Focus on the last two sentences" (Turn 10), and "Spend too much... online" (Turn 12). The gradual increase in explicitness demonstrated Reza's contingent mediation. As Tina struggles to locate the error independently, Reza adjusts his prompts to match his evolving needs. Tina correctly identifies and revises 'spend too much ... online' to 'spend too much time online' (Turn 13). Tina's ability to correct the error after receiving explicit mediation shows that the concept was within her ZPD and successfully internalized. Reza then initiated lexical mediation by suggesting that Tina considered alternative terms for 'negative ones'

in the conclusion paragraph (Turn 19). Tina proposes ‘adverse effects’ (Turn 20), which Reza approved. This exchange highlights Tina’s ability to independently propose appropriate alternatives, suggesting she has a solid foundation in lexical substitution. Reza encouraged Tina to reconsider ‘bad effects’ in favor of more precise terms like ‘negative effects’ or ‘consequences’ (Turns 22–26). Reza’s prompts encourage Tina to think critically about nuances and word choices, thus enhancing her lexical precision. Subsequently, Reza directed Tina to revise ‘fake news’ to a more formal term. Tina initially struggles (Turn 30) but ultimately suggests ‘unreliable news’ (Turn 34), which Reza supports. Tina’s progression from requiring explicit guidance to independently generating a suitable alternative reflected the co-construction of lexical knowledge. Reza then identified a vague pronoun (‘this’ in line 3 of the second paragraph), but admitted that he could not suggest a replacement (Turn 39). Reza’s limited expertise leads to a dynamic shift, where Tina suggests ‘such platforms’ (Turn 44). Tina’s suggestion demonstrates her ability to address cohesion issues independently. This marks a transition in which Tina assumes greater responsibility for refining her writing, showing growth in her ability to handle cohesion challenges. Regarding task response, Reza prompted Tina to elaborate on the impact of social isolation in the second paragraph (Turn 50). Tina proposed an additional sentence to address this issue (Turn, 51). This indicates that Reza’s prompt helped Tina identify the gap in her response to the essay prompt. Her ability to construct a new sentence demonstrated her growing understanding of task response requirements. Tina proposes that social isolation may cause a decline in community gatherings and weaken family ties’ (Turn 51). Tina’s contribution demonstrates her ability to incorporate feedback into her writing, moving closer to meeting the task’s expectations.

Results of the focus group interview. The third research question examined EFL learners’ attitudes toward their experiences with using OFPDA to enhance their academic writing skills. Twelve EFL learners from the flipped group participated in a voluntary focus-group interview. The analysis of the discussions revealed themes and subthemes (See Table 2).

Table 2. Themes and sub-themes of the data gathered through the focus group interview

Themes	Sub-themes
1. Enhancing the Learning Experience through OFPDA	a) boosting learners’ motivation b) Increasing learners’ self-efficacy c) developing learners’ preparation time d) receiving graduated and contingent feedback e) hindering cognitive overload
2. Challenges and Limitations of OFPDA	a) The time-consuming nature of OFPDA b) Technical issues

Boosting learners' motivation

In most instances, the current study participants perceived the online flipped peer dynamic assessment (OFPDA) as a novel alternative that engaged them in English writing tasks. Most learners recognized distinctions between the OFPDA and the traditional writing courses they had previously taken. These learners demonstrated a favorable attitude towards pre-class learning activities such as watching instructional videos and performing peer dynamic assessment (PDA). They noted that compared to previous writing instruction, where they had limited time for actual writing and experienced frustration, this approach motivated them to write well-organized academic writing during the in-class time, as they felt prepared before class. Learner 5 (L5), for instance, stated that

This approach greatly encouraged me to engage in more writing exercises. Mastering the principles of writing allowed me to relish writing in English. I made an effort to search for IELTS topics to write about.

This line of the study indicated that flipped peer dynamic assessment significantly contributed to EFL learners' motivation development, outperforming the results achieved in the control group. These results align with Adnan's (2017) study, which highlights the integration of peer feedback in a flipped classroom setting, which enhances students' engagement, motivation and writing skills.

Increasing learners' self-efficacy

Many learners concentrated on boosting their self-efficacy by applying OFPDA. They reported that watching videos before class and receiving contingent and graduate feedback from their peers assisted them in boosting their self-efficacy while writing academically. As L2 voiced:

I once believed that I lacked writing ability and would never achieve the desired level of proficiency. However, after participating in this study, I realized that my struggle was primarily generating ideas. It often took me a long time to develop coherent thoughts. Through peer discussions in pre-class and group discussions during the in-class time, I learned that I possess writing skills; I simply need to dedicate more time to studying and cultivating creative ideas.

Integrating peer dynamic assessment into the flipped model has significantly enhanced learners' self-efficacy in academic writing. A systematic review by Sun et al. (2023) highlighted that peer feedback catalyzes improving students' academic writing quality and refining their writing skills, thereby contributing to heightened self-efficacy. These findings underscore the effectiveness of OFPDA in fostering a supportive learning environment that promotes self-assured and proficient academic writing.

Developing learners' preparation time

Many learners reported that pre-class activities, such as watching videos and performing PDA, allowed them to strategically prepare for in-class activities. They believed that OFPDA was a beneficial approach since watching pre-class videos saved them more time for performing pre-class activities, pausing the videos for taking notes, and rewinding or fast-forwarding the videos based on their learning pace. As L4 stated:

In a flipped classroom setting, I watch, rewind, fast-forward, and pause the writing video clips, and I complete pre-class assignments in collaboration with my partner before attending the class. In this way, I enter the classroom with a foundation of concepts already in mind. This preparation allowed me to approach in-class activities with a clear plan, swiftly grasping new information during teacher-led discussions, and effectively incorporating it into my writing.

This approach enables learners to manage their study time effectively, as they can pause, rewind, or fast-forward videos to align themselves with their learning pace. Akçayır and Akçayır (2018) stated that the flipped classroom model reduces the amount of time spent lecturing, provides a hands-on experience, and helps students become more prepared and engaged during class. These findings suggest that OFPDA fosters a more effective learning environment by allowing students to enter the classroom with a solid foundation of concepts, thereby enhancing their readiness to engage in higher-order cognitive tasks during class sessions.

Receiving graduated and contingent feedback

All focus group participants (i.e., 12 learners) reported that watching instructive videos and receiving contingent feedback from their peers in completing the pre-class activities helped them build their academic writing skills and promoted their motivation and autonomy to write academically. L9 asserted that:

During the pre-class phase of the flipped classroom, my partner could discern my needs and pinpoint areas where I may be struggling. Consequently, he offered me incremental support in crafting the correct sentence structure and content by providing well-suited and progressive hints, while in a traditional classroom setting, it may take the teacher two to three days to provide feedback on my writing assignments.

They believed that receiving graduate and contingent feedback helped them concentrate on their academic strengths and weaknesses. Wu and Schunn (2021) demonstrated that engaging students in peer feedback facilitates the revision process and improves writing skills, as peers can offer immediate, targeted assistance that instructors may not be able to provide promptly. These findings suggest that graduated and contingent peer feedback mechanisms effectively promote self-directed learning and enhance the quality of academic writing.

Hindering cognitive overload

Most participants mentioned several benefits of instructional videos that reduce the cognitive load required for learning. Learners had the autonomy to determine the amount of information they desired or could absorb within a given timeframe for pre-class activities. These participants also noted that regulating their pace was easier when learning complex concepts through the flipped approach, so they were inclined to learn at their own pace by watching the videos. L10 asserted that:

Watching videos at my own pace during pre-class reduced my stress. I could manage the time and amount of knowledge I needed to be an expert in the session content.

This line of study corroborates Abeysekera and Dawson (2015), who suggested that flipped classroom methodologies can reduce extraneous cognitive load by allowing students to engage with learning materials at their own pace, thereby fostering a more personalized and effective learning experience. This self-paced approach enables students to manage the volume of information they consume, align it with their capacity, and reduce the stress associated with acquiring complex concepts.

Challenges and limitations of OFPDA

Time-consuming nature of OFPDA

A few learners reported that OFPDA was a time-consuming approach. As evidenced by these learners, watching videos and conducting OPDAs for pre-class activities require more time to complete pre-class writing tasks than in conventional classrooms. L2 stated that:

The flipped classroom was a highly effective and enjoyable experience, especially during the summer holidays when I had fewer university projects to focus on. Although the pre-class tasks helped me participate actively in in-class activities, the amount of time I needed for pre-class tasks bothered me.

They affirmed that the OFPDA assisted them in organizing their understanding and applying it during in-class activities to write more accurate academic writings. However, the time-consuming nature of this innovative approach hinders students from passionately practicing writing tasks.

Technical issues

Several participants reported technical difficulties, including connectivity issues and Google Meet malfunctions, which disrupted their pre-class sessions and hindered the continuity of their learning processes. For instance, L4 reported the following:

In rare instances, a poor Internet connection during a practice session interrupts the mediation process.

It is worth noting that the current research involved a small number of EFL learners throughout the study, particularly in the focus group interviews (i.e., 12 learners). As a result, the generalizability of the focus group interview findings might not be strongly suggested.

Discussion

This study makes a unique contribution to flipped classrooms and EFL writing by implementing an online peer dynamic assessment. The main argument is that incorporating dynamic peer assessment can enhance the flipped learning strategy. Driven by Vygotsky's SCT, specifically the notion of mediation, this study has provided quantitative and qualitative evidence that shows that online flipped peer dynamic assessment has significantly improved students' writing skills and created a better context for peer interaction, which is believed to be conducive to language learning (De Guerrero & Villamil, 2000; Hyland & Hyland, 2006). We believe that the development in students' writing skills was due to several integrated factors. First, the MALL framework was crucial. MALL provided the technological platform for the entire pre-class phase, affording students the flexibility to access instructional videos and engage in synchronous peer mediation sessions from any location using their personal devices. This technological affordance was the backbone of the OFPDA model. Second, the flipped learning design facilitated student interaction with artifacts in the form of instructional writing videos before class. Third, we credit the provision of ongoing contingent and graduated peer mediation in PDA. Finally, this was supported by the students' high motivation towards writing using OFPDA. These points are further discussed below.

As demonstrated in our qualitative findings, implementing OFPDA has helped students interact with online materials related to writing skills before attending the classroom. The availability of these artifacts (i.e., instructional writing tutorial videos) has enabled students to watch the videos multiple times in a more convenient location at a pace that suits their preferences (Huang et al., 2024). From an SCT perspective, this type of interaction enabled self-regulated learning to occur. The flexibility of flipped learning enhances learners' autonomy, allowing them to regulate their own learning process and improve writing skills at their own pace using online materials (Fisher et al., 2019). Learners in the experimental group may have had multiple pathways for understanding and catering to diverse learning styles, which assisted them in developing their writing skills compared to their counterparts in the control group. Agreeing with other researchers' arguments (e.g., Alghasab, 2020; Aghaei et al., 2019; Lee & Martin, 2020), we believe that interacting solely with artefacts before the classroom may have several challenges, including difficulties in understanding the pre-class materials, which require intervention from the teacher or peers using peer dynamic assessment.

The main finding of the current study also showed that integrating PDA into the flipped learning model has significantly improved students' writing skills. As presented in the previous section and in other studies' findings (Behforouz & Al Ghaithi, 2025; Fathi & Rahimi, 2020; Zhao & Yang, 2023), quantitative findings revealed that the flipped group outperformed the non-flipped group in terms of academic writing skills. The integration of PDA before class has provided greater opportunities for social mediation by receiving contingent and graduated peer mediation in pre-class time. The EFL learners' acknowledgement of the fact that OFPDA assisted them in receiving peers' contingent and graduated feedback in pre-class time is congruent with Vygotsky's (1978) SCT, which maintained that ZPD in providing contingent and graduated feedback from a more capable individual to move L2 learners forward from the current level of performance (ZPD) to their Zone of Actual Development (ZAD) (higher level of development). According to Lantolf and Poehner (2010), employing contingent and graduated mediation in DA approaches is highly beneficial for helping EFL learners achieve ZPD and determining how to address their learning deficiencies. The effectiveness of OFPDA in enhancing EFL learners' writing skills supports the idea that contingent and graduate guidance tailored to learners' ZPDs can unveil their evolving capabilities and boost their progress (Lantolf & Poehner, 2014). As highlighted by Poehner et al. (2015), this line of study may be attributed to the diagnostic potential of the OFPDA. Learners may have identified the writing mechanisms that fell within their ZPDs and those that were beyond it by receiving contingent and graduate mediation from their peers in pre-class and in-class times. This process has likely helped students better understand their academic writing strengths and drawbacks. Agreeing with other researchers' arguments (e.g., Aghaei et al., 2019; Lee & Martin, 2020; Lee & Wallace, 2018), this paper has shown that the development of students' writing skills was not simply a result of implementing the flipped classroom strategy. Still, this was primarily due to the peer interaction that occurred within this framework. Thus, social mediation, facilitated by the flipped learning framework, has been instrumental in assisting students to develop their writing skills. The focus group interview findings and the micro-genetic analysis revealed that the EFL learners benefited from applying OFPDA in the current study due to contingent and graduated peer mediation during pre-class activities and in-class tasks. This result corroborates the findings of Rezaei et al., (2022) who found that scaffolding, peer feedback and learners' engagement in flipped classrooms eventually improve writing quality in EFL settings. Following Rahimi and Fathi's (2021) findings, in the current study, EFL learners were able to easily brainstorm ideas for their writing tasks in a flipped setting, organize these ideas to complete their writing tasks, and collaboratively manage the content, structure, and language aspects of their tasks.

In line with Su Ping et al. (2020), implementing OFPDA assisted learners by increasing their preparation time. Rewinding, fast-forwarding, and pausing instructional writing videos for notetaking, subsequently performing PDAs via the Google Meet application, aided the learners in preparing for the in-class tasks. The microgenetic analysis of students' interactions has significantly

shown instances of collaborative talk (Swain, 2000) where students discuss their lexical and grammatical knowledge. In other words, they engage in languaging, a process believed to develop individual writing skills. Additionally, interacting with peer and instructional writing videos helps EFL learners reduce their cognitive overload. Rewatching, rewinding, fast-forwarding, pausing, and performing PDA during pre-class time have positively impacted learners' writing experiences. This aligns with previous studies (e.g. Lee & Martin, 2020; Xin & Zhang, 2024), which reported that flipped classrooms reduce learners' cognitive load. In addition, implementing OFPDA has improved students' writing skills due to its positive effect on learners' self-efficacy. Since self-efficacy and self-regulation are interconnected (Su et al., 2019), it can be suggested that not only the collaborative writing facilitated by the OFPDA, but also the enhancement of EFL learners' self-regulation in writing resulting from this collaborative process, may have influenced their writing self-efficacy.

The results of the qualitative analysis also demonstrated that the flipped classroom enhanced the students' writing motivation. These findings are consistent with those of previous studies by Fathi et al. (2022), Su Ping et al. (2020), and Wu et al. (2019), all of which highlight the positive impact of a flipped classroom on increasing student motivation for writing learning. The contention is that learners' preparation before class (i.e., watching writing videos and doing PDAs) and active participation in collaborative writing tasks, supported by the instructor's and peers' contingent and graduated feedback, significantly boosted EFL learners' writing motivation.

In alignment with Vygotsky's ZPD notion, the focus group interview results highlighted that flipped learners were more adept at collaborating with their peers and assisting them in improving their writing skills during the in-class tasks. The results regarding writing motivation are also supported by the theory of motivation in second or foreign language learning proposed by Dörnyei and Otto (1998), which views motivation as a constantly evolving and fluid concept. In this model, it is believed that the learning environment can affect students' motivation. The specific setting of the flipped classroom, including the incorporation of instructional writing videos and performing PDAs during pre-class time and ample opportunities for collaborative writing tasks during in-class time, is thought to enhance EFL learners' writing motivation. However, Liu et al. (2022) illustrated that while writing metacognitive strategies were improved in flipped settings, they did not inherently lead to motivational enhancements. This distinction implies that improvements in writing skills do not necessarily correlate with heightened motivation, reinforcing a nuanced understanding of the factors contributing to student motivation in writing scenarios.

This study makes a unique contribution to flipped classrooms and EFL writing by implementing an online peer dynamic assessment. By facilitating peer interaction and feedback in a technology-enhanced environment, this approach not only fosters collaborative learning but also empowers students to take ownership of their learning process, thus enriching the traditional pedagogical framework of the flipped classroom. Moreover, the findings extend those of previous studies (e.g., Fathi & Rahimi, 2020; Zhao & Yang, 2023) by

demonstrating that integrating peer assessment within the flipped model can significantly enhance writing outcomes and learner engagement, which has not been thoroughly examined in previous studies. This evidence contradicts Double et al. (2019), suggesting that peer assessment can be effective, but its impact varies significantly depending on the context and implementation. Their findings suggest that the anticipated significant enhancement in writing outcomes attributed to collaborative activities may not consistently materialize, challenging broad claims regarding the effectiveness of peer assessment within the flipped classroom model.

Conclusion, implications, limitations, and suggestions for further research

The current research demonstrates that implementing OFPDA significantly enhances EFL learners' academic writing skills and fosters positive attitudes toward academic writing. The outcomes of the microgenetic development approach provide clear evidence that the application of graduated and contingent prompts significantly improves students' writing performance. Overall, the results of the focus group interviews revealed that EFL learners held positive attitudes towards the effectiveness of OFPDA in enhancing their writing skills.

The implications of this study for pedagogy are significant. Implementing these findings can help policymakers create an optimal educational environment for EFL teachers and learners to enhance their writing skills in flipped classrooms. Professional development programs should train teachers to design and execute OFPDA-based instruction, equipping them with strategies for effective scaffolding, instructional videos, and peer-mediated assessments. EFL teacher educators should promote flipped classrooms and provide guidance on establishing successful flipped writing classrooms. EFL instructors could adopt a flipped classroom approach by altering the instruction sequence, offering pre-class instructional videos, doing PDA, and initiating class sessions with practical writing tasks. EFL learners are encouraged to watch, rewind, fast-forward, and pause instructional video clips for note-taking and to prepare for in-class activities, thus enabling them to address writing challenges during collaborative tasks. Learners should set personal writing goals and maintain reflective writing journals to monitor their progress and develop an awareness of their writing strengths and areas for improvement. Incorporating online resources can enhance independent writing skills. Educators should encourage learners to share their written work with peers and develop guidelines for providing constructive feedback, thereby cultivating a supportive learning community that promotes critical thinking and reflection on writing practices.

This study had some limitations. It involved a small number of EFL learners, which may have limited the generalizability of the findings. Furthermore, our application of the microgenetic method was illustrative, focusing qualitatively on the path and source of change in a single, representative dyad. A more extensive study could conduct a quantitative microgenetic analysis across multiple

participants to systematically investigate other dimensions of change, such as the rate, breadth, and variability of learning. Researchers should replicate this study with a larger sample size to further validate its findings. The study's single concern about the text (Iranian University) raises cultural and contextual concerns. Future research should explore the applicability of OFPDA in diverse educational settings to validate its effectiveness. Cultural biases might have influenced the participants' responses, as collaborative learning and peer feedback may be perceived differently. Cross-cultural studies can provide insights into OFPDA's function in distinct EFL settings. Future studies could investigate the impact of OFPDA on other language skills, such as listening, speaking, and reading comprehension. OFPDA represents a significant advancement in EFL writing and flipped classrooms, enhancing learner engagement and improving writing outcomes. Our findings underscore that integrating MALL is a critical component, providing the necessary technological infrastructure to make this online flipped peer assessment model viable and effective. Researchers, educators, and policymakers should integrate OFPDA into practice, championing a paradigm shift in language education for 21st-century learners.

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Appendix A

Screenshot of the coursebook practice

WRITING TASK 1

You should spend about 20 minutes on this task.

The chart shows the percentage of male and female teachers in six different types of educational setting in the UK in 2010. Summarise the information by selecting and reporting the main features, and make comparisons where relevant.

Write at least 150 words.

