

Collaborative Processes in EFL Argumentative Writing in Different Learning Environments: A Qualitative Study

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ABSTRACT

Drawing on the Writers-within-Community (WWC) model, this study examined how EFL students collaboratively engaged in integrated argumentative writing tasks and how different learning environments mediated their collaborative processes. A qualitative design was adopted, drawing on multiple data sources, including audio-recorded discussions, collaboratively written texts, revision histories, and stimulated recall interviews. Four dyads of EFL learners participated in collaborative discussion and writing tasks in either face-to-face or blended learning environments. The findings showed that students actively exchanged ideas during face-to-face discussion; however, their interaction mainly focused on idea generation rather than systematic argumentative development. More substantial differences emerged during the writing and revision phases. In the face-to-face environment, students tended to divide the writing task and compose sections individually, resulting in limited joint text construction and surface-level revision. In contrast, the blended learning environment supported more interactive collaboration, facilitating joint elaboration and deeper revision. These findings highlight the role of learning environments in shaping collaborative argumentative writing processes.

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Contribution/Originality: This study provides a process-oriented account of how physical learning environments shape collaborative argumentation and writing in an EFL context, highlighting the role of text visibility and shared writing in mediating interaction and revision.

1. Introduction

Developing the ability to construct well-reasoned arguments is a central goal of academic writing instruction, yet it remains a persistent challenge for learners of English as a Foreign Language (EFL) (Granado-Peinado et al., 2019; Guo et al., 2022; Lam et al., 2018). Argumentative writing requires writers to formulate clear claims, engage with counterarguments, and provide rebuttals supported by evidence, while simultaneously managing linguistic, rhetorical, and discourse-level demands (Landrieu et al., 2022; Stapleton & Wu, 2015). Previous research has shown that many EFL learners struggle to achieve a balanced integration of reasoning and language, often producing texts that are descriptively adequate but limited in argumentative depth or critical engagement (Ferretti & Graham, 2019).

From the perspective of the Writers-within-Community (WWC) model, writing is conceptualized as a socially situated activity that emerges from the dynamic interplay between cognitive processes and participation in communities where writers interact with peers, tasks, and mediational tools (Graham, 2018). Writing development, therefore, is not viewed as an isolated individual endeavor but as a process shaped through interaction, shared regulation, and engagement with others within specific learning contexts. Within such communities, collaboration plays a central role in shaping how arguments are constructed and texts are produced (Landrieu et al., 2022). In response to the challenges faced by EFL learners, collaborative pedagogical approaches, particularly collaborative argumentation and collaborative writing, have been proposed as ways to support learners' reasoning and writing development through peer interaction and mutual scaffolding (Jin et al., 2020; Su et al., 2021). Empirical research has shown that collaborative argumentation supports the development of reasoning through interaction, while collaborative writing facilitates joint decision-making and text revision, enabling learners to transform collaboratively constructed ideas into written form (Chen et al., 2016; Elabdali, 2021; Matos, 2021; Shi et al., 2019; Short et al., 2020; Storch, 2013; Teng & Huang, 2021; Zabihi & Bayan, 2020). These collaborative approaches create opportunities for learners to co-construct ideas and jointly shape written texts through interaction.

Despite these pedagogical benefits, collaborative approaches remain challenging to implement in many EFL classrooms. Compared with individual writing, collaborative discussion and joint text production are often perceived as time-consuming and difficult to manage within limited instructional time (McDonough et al., 2018). These constraints suggest that the effectiveness of collaborative pedagogies depends not only on task design, but also on how opportunities for interaction and revision are distributed across instructional time and space.

One way in which teachers and researchers have attempted to address these constraints is through the use of different physical learning environments (Jiang et al., 2021; Lam et al., 2018; Rouhshad et al., 2016). By reorganizing when, where, and how collaborative interaction takes place, physical learning environments can potentially make time-intensive collaborative practices more feasible within classroom realities. From this perspective, physical environments are not merely backdrops for interaction but active conditions that shape the enactment of collaborative pedagogy.

Within this framework, face-to-face environments afford immediate verbal exchange and access to non-verbal cues, supporting rapid coordination of ideas within limited

classroom time (Jiang et al., 2021; Rouhshad et al., 2016). In contrast, blended learning environments extend collaboration beyond the physical classroom through digital tools that enable shared visibility of texts, synchronous co-editing, and iterative revision across time and space (Dousti & Amirian, 2023; Hassan et al., 2021). From a Writers-within-Community (WWC) perspective, such environments function as mediational spaces that reorganize participation and interaction, thereby shaping learners' collaborative meaning-making and writing development.

Although previous studies have examined collaborative learning and blended instruction in EFL writing, much of the existing research has focused on learning outcomes rather than on the collaborative processes through which argumentative texts are constructed. In particular, limited attention has been paid to how different physical learning environments mediate students' interactional practices during collaborative learning activities. Consequently, there remains a need for process-oriented research that examines how collaborative learning is enacted under different physical learning conditions. To address this need, the present study adopts a qualitative approach to investigate EFL students' collaborative processes during argumentative writing tasks across learning environments.

1.1. Research Objectives and Questions

The study aims to investigate how students interact, negotiate ideas, and jointly construct written texts during collaborative learning activities, and to examine how learning environments mediate these collaborative processes. By focusing on interactional patterns and shared meaning-making, the study seeks to provide a deeper understanding of how collaborative learning unfolds in EFL argumentative writing contexts.

The study is guided by the following research questions:

- i. RQ1. How do EFL students collaboratively engage in argumentative writing tasks?
- ii. RQ2. How do learning environments mediate students' collaborative processes during argumentative writing tasks?

2. Literature Review

2.1. Challenges of Argumentative Writing in EFL Contexts

Argumentative writing is widely recognized as a cornerstone of effective academic communication, as it requires writers to articulate positions, evaluate alternative viewpoints, and justify claims through evidence-based reasoning (Granado-Peinado et al., 2019). It is also one of the most prevalent forms of academic writing and a fundamental requirement in higher education, particularly in English-medium assessment contexts (Zabihi & Bayan, 2020). In many EFL settings, including China, argumentative writing plays a central role in high-stakes English proficiency examinations such as the CET-4/6 and IELTS, which have significant implications for students' academic progression and professional opportunities (Guo et al., 2022; Lam et al., 2018). As a result, the ability to produce high-quality argumentative texts is regarded as an essential competence for EFL learners (Matos, 2021; Shi et al., 2019).

Despite its importance, producing effective argumentative writing is cognitively and linguistically demanding. High-quality argumentative texts require writers to manage multiple dimensions simultaneously, including the organization of arguments and the effective use of language (Landrieu et al., 2022). From an argumentation perspective, well-developed texts are expected to include claims, counter-argument claims, and rebuttals supported by appropriate evidence, as well as coherent reasoning across these components (Stapleton & Wu, 2015). Beyond structural considerations, content-related qualities such as persuasiveness, factual accuracy, and the integration of information from source texts also play a crucial role in determining overall writing quality (Landrieu et al., 2022). At the same time, argumentative writing performance is closely tied to language use, commonly conceptualized in terms of complexity, accuracy, and fluency (Barrot & Gabinete, 2021; Teng & Huang, 2021; Villarreal & Gil-Sarratea, 2020).

Given these combined demands, it is not surprising that EFL learners often demonstrate persistent difficulties in argumentative writing. Empirical evidence consistently shows that EFL students struggle to construct balanced arguments, frequently omitting counter-arguments and rebuttals and producing one-sided texts (Hemberger et al., 2017; Lam et al., 2018; Najjemba & Cronje, 2020). For example, Jin et al. (2020) reported that many Chinese EFL university students failed to include counter-argument sections in their essays, while Rusfandi (2015) found that Indonesian EFL learners tended to focus narrowly on stating claims without engaging opposing views. In addition to argumentation-related challenges, EFL learners often experience difficulties maintaining adequate levels of linguistic complexity, accuracy, and fluency when expressing complex reasoning in writing (Ferretti & Fan, 2016; Ferretti & Graham, 2019).

Taken together, the dual burden of constructing sophisticated arguments and managing second-language resources makes argumentative writing particularly challenging for EFL learners. These challenges have motivated increasing pedagogical interest in instructional approaches that can support learners' reasoning development while alleviating individual cognitive and linguistic load, thereby paving the way for collaborative approaches to argumentative writing.

2.2. Physical Learning Environments and EFL Students' Collaborative Processes

Collaborative learning processes do not unfold in isolation but are situated within and shaped by the physical learning environments in which interaction occurs. In face-to-face classrooms, collaboration is typically characterized by immediate verbal exchange, turn-taking, and access to non-verbal cues, which can facilitate rapid negotiation of meaning and spontaneous co-construction of ideas. Such environments may be particularly conducive to oral argumentation, where reasoning is developed through real-time dialogic interaction (Rouhshad et al., 2016; Jiang et al., 2021). Face-to-face interaction also allows learners to clarify meaning and receive immediate feedback, thereby supporting the co-construction of shared understanding and argumentative reasoning.

In contrast, blended learning environments extend collaboration beyond the physical classroom by incorporating digital tools that support shared visibility of texts, synchronous or asynchronous co-editing, and iterative revision. Within these environments, learners can interact with both peers and written artifacts over time,

allowing for greater opportunities to revisit ideas, refine arguments, and attend to linguistic form. Empirical studies have shown that blended environments enhance idea development, organization, and language accuracy by providing extended opportunities for interaction and revision (Lam et al., 2018; Hassan et al., 2021). Moreover, blended learning can redistribute learners' attention across different phases of collaborative work, with discussion emphasizing reasoning and online writing foregrounding textual organization and language use (Jin et al., 2020; Su et al., 2021). Additional research also indicates that blended environments support learner engagement and writing proficiency through the integration of synchronous and asynchronous interaction (Dousti & Amirian, 2023; Rahman et al., 2020).

From the perspective of the Writers-within-Community (WWC) model, writing is conceptualized as a socially situated activity that emerges from the dynamic interplay between cognitive processes and participation in communities where writers interact with peers, tasks, and mediational tools (Graham, 2018). Within this framework, physical learning environments function as mediational spaces that organize interactional patterns, shape participation structures, and influence how writers coordinate reasoning and text production. Differences between face-to-face and blended environments, therefore, are not merely technical but pedagogical, as they afford distinct forms of interaction and engagement during collaborative writing.

Although a growing body of research has examined collaborative learning and blended instruction in EFL writing, much of this work has focused on learning outcomes, such as writing quality or linguistic performance (Jin et al., 2020; Su et al., 2021; Hassan et al., 2021). Comparatively less attention has been paid to the collaborative processes through which argumentative texts are constructed. Moreover, few studies have systematically examined how different physical learning environments mediate students' interactional practices during collaborative learning activities.

Taken together, existing research highlights the pedagogical potential of collaborative learning while also pointing to the need for greater attention to classroom realities and learning environments. Understanding how collaborative processes unfold across different learning settings can provide valuable insights into how collaborative approaches may be realistically enacted within EFL classrooms and how learning environments shape students' opportunities for collaborative meaning-making and writing development.

3. Methodology

3.1. Research Design

This study adopted a qualitative, process-oriented research design to examine EFL students' collaborative processes during collaborative argumentative writing tasks in two physical learning environments: face-to-face and blended learning. The study focused on how learners interacted, negotiated meaning, and jointly constructed arguments and texts across different collaboration settings.

A qualitative approach was considered appropriate because the research questions aim to capture interactional patterns, collaborative practices, and the transformation of ideas from discussion to writing. By triangulating multiple qualitative data sources,

the study sought to provide a rich and contextualized account of learners' collaborative processes as they unfolded in classroom-based tasks.

3.2. Participants and Context

The participants were EFL learners enrolled in an academic writing course at a private English language training institution in China. All participants had received formal English instruction for more than ten years and were preparing for high-stakes academic writing tasks. Their overall English proficiency ranged from intermediate to upper-intermediate, which allowed them to engage in extended peer discussion and collaborative writing in English. Participants with IELTS scores of 5.0–5.5 were classified as intermediate, while those with scores of 6.0–6.5 were considered upper-intermediate.

For the purpose of in-depth qualitative analysis, four dyads (eight students) were purposively selected from the instructional context, including two dyads from the face-to-face environment and two dyads from the blended learning environment. The selection criteria focused on (a) students' active participation in collaborative tasks, and (b) the completeness and clarity of interactional data collected across discussion, writing, and revision phases. This purposive sampling approach was adopted to ensure interactional richness rather than representativeness, in line with the process-oriented focus of the study. This relatively small sample size is consistent with qualitative research traditions that prioritize depth of interactional analysis over statistical generalizability.

The instructional context reflected typical classroom practices in EFL writing instruction, where collaborative discussion is followed by joint text production. This setting allowed the study to capture collaborative processes as they naturally occurred during regular classroom activities rather than under experimental conditions. Table 1 presents the background information of the selected participants.

Table 1: Background Information of Selected Participants

Dyad	Participant	Gender	Proficiency	Learning Environment
1	P1	Female	Intermediate (IELTS 5.5)	Face-to-face
1	P2	Male	Upper-intermediate (IELTS 6.0)	Face-to-face
2	P3	Male	Intermediate (IELTS 5.0)	Face-to-face
2	P4	Female	Upper-intermediate (IELTS 6.5)	Face-to-face
3	P5	Female	Intermediate (IELTS 5.5)	Blended
3	P6	Male	Intermediate (IELTS 5.5)	Blended
4	P7	Female	Upper-intermediate (IELTS 6.0)	Blended
4	P8	Male	Intermediate (IELTS 5.0)	Blended

3.3. Instructional Task and Learning Environments

All participants engaged in a collaborative argumentative writing task designed to support argumentative essay development. The task consisted of two main phases: a collaborative discussion phase and a collaborative writing phase.

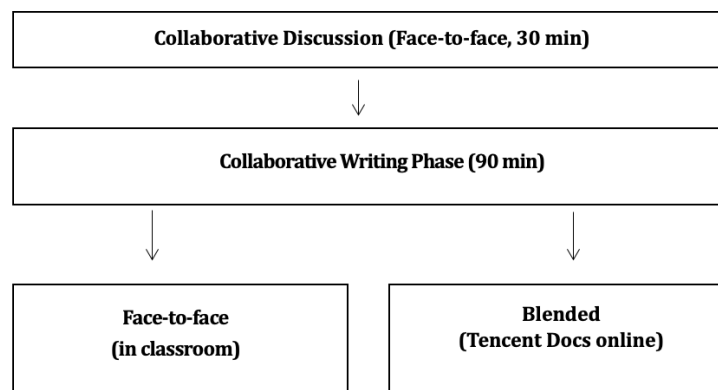
During the collaborative discussion phase, students worked in dyads to discuss an argumentative prompt. The discussion was conducted face-to-face for all participants,

allowing learners to exchange ideas, justify claims, and consider alternative viewpoints through verbal interaction. The same prompts were used across learning environments to ensure task comparability.

The collaborative writing phase differed across physical learning environments. In the face-to-face environment, students jointly produced and revised an argumentative essay in the classroom, coordinating their writing through verbal negotiation and shared planning. In the blended learning environment, students completed the collaborative writing task using an online shared document platform (Tencent Docs), which allowed them to compose, revise, and edit the text synchronously.

The instructional intervention consisted of ten instructional sessions, of which seven sessions involved collaborative discussion and writing tasks. The initial sessions were devoted to task orientation and training, while the final session was used for post-task assessment. In each collaborative session, students first engaged in a 30-minute collaborative discussion, followed by a 90-minute collaborative writing and revision phase. This structure was kept consistent across learning environments. The task design and timing were maintained to ensure that observed differences could be attributed to the learning environment rather than task variation. The overall instructional procedure across learning environments is illustrated in Figure 1.

Figure 1: Task Procedure Across Learning Environments



3.4. Data Collection

Multiple qualitative data sources were collected to capture different dimensions of the collaborative process and to allow for triangulation.

First, audio recordings of collaborative discussion sessions were collected from the selected dyads across three sessions (Sessions 5, 7, and 9), which represented the middle and later stages of the instructional intervention. In total, 12 discussion recordings were obtained. These recordings documented learners' interactional practices during collaborative argumentation, including how they proposed claims, responded to peers, and negotiated meaning in real time.

Second, collaboratively written essays produced by each dyad during these sessions were collected as artifacts of joint text construction. A total of 12 collaboratively written texts were collected, including six handwritten texts from the face-to-face environment and six texts produced using Tencent Docs in the blended learning

environment. These texts provided insight into how argumentative ideas were organized and represented in writing.

Third, revision histories of all 12 collaboratively written texts were collected. These records enabled detailed examination of how learners modified content, structure, and language during collaborative writing. In the blended learning environment, revision histories were automatically tracked through Tencent Docs, while in the face-to-face environment revisions were identified by comparing successive drafts.

Finally, stimulated recall interviews were conducted individually with each participant after Sessions 5, 7, and 9. In total, 24 semi-structured interviews were conducted, with each participant completing three interviews. Each interview lasted approximately 30 minutes. The interviews were conducted in Chinese to ensure participants' comfort and depth of reflection. During the interviews, participants reviewed excerpts from their discussions and collaborative drafts and reflected on their collaborative interactions, decision-making processes, and experiences in different learning environments.

All interviews were audio-recorded and transcribed for analysis. Together, these multiple data sources allowed for triangulation of interactional, textual, and reflective evidence in examining students' collaborative processes.

3.5. Data Analysis

Data analysis followed a qualitative content analysis approach supported by NVivo software. Multiple data sources were analyzed to examine students' collaborative processes across learning environments.

Collaborative discussion transcripts were first segmented into idea units, defined as clauses or sentences expressing a single meaningful contribution. As can be seen from Table 2, these units were coded using a framework adapted from Stapleton and Wu (2015), which categorized argumentative practices into claims, counter-arguments, rebuttals, and corresponding supporting evidence. This coding enabled the identification of interactional patterns during collaborative argumentation.

Collaboratively written texts were analyzed using the same coding framework to examine how argumentative ideas were structured and developed in writing. Applying a consistent coding scheme across discussion and written texts facilitated comparison between interactional and textual dimensions of collaborative learning.

Table 2: Coding Scheme for Argument Construction Practice

Themes	Codes	Description
Claim	Claim Presenting	The presentation of a primary argument or position related to the task or topic.
	Evidence for Claim	The presentation of data, reasoning, or examples to support the claim.
Counter-argument	Counter-Argument Presenting	The presentation of an opposing viewpoint that challenges the initial

claim		claim.
	Evidence for Counter-Argument	The presentation of data, reasoning, or examples to support the counter-argument.
Rebuttal	Rebuttal Presenting	The presentation of a rebuttal that refutes the counter-argument and defends the original claim or presents a new perspective.
	Evidence for Rebuttal	The presentation of data, reasoning, or examples to support the rebuttal.

Note: The coding scheme was based on the argumentative framework of Stapleton and Wu (2015)

Revision histories of collaboratively written texts were analyzed using process-oriented content analysis. Revisions were coded into categories such as additions, deletions, reorganization, and language-focused changes, based on an adapted revision coding framework, as presented in Table 3. This analysis provided insight into how ideas generated during discussion were transformed during collaborative writing.

Table 3: Code Scheme for Revision History

Theme	Code	Description
Argument-related	Adding	Adding arguments/evidence
	Deleting	Removing redundant ideas
	Reordering	Improving logical flow
	Rephrasing	Clarifying claims
Language-related	Word choice	Lexical substitution
	Sentence structure	Syntactic restructuring
	Cohesion	Using linking devices
	Grammar	Error correction
	Minor edits	Tone adjustment
	Mechanics	Spelling/punctuation

Note: This code scheme is adapted from the frameworks provided by Jin et al. (2020) and Li and Kim (2016).

Stimulated recall interviews were analyzed thematically to capture learners' perceptions of collaboration, interactional challenges, and the influence of physical learning environments on their collaborative processes.

Throughout the analysis, constant comparison was employed to identify similarities and differences in collaborative processes across face-to-face and blended learning environments. Triangulation across multiple data sources further enhanced the robustness of the findings.

3.6. Trustworthiness

To enhance the credibility and trustworthiness of the qualitative analysis, several strategies were employed. Data triangulation was achieved by drawing on multiple

sources, including interaction transcripts, written texts, revision records, and interview data. Member checking was conducted by inviting participants to review interview transcripts and clarify their intended meanings. In addition, an audit trail documenting analytic decisions was maintained throughout the research process to ensure transparency and consistency.

4. Findings

4.1. Students' Collaborative Engagement During Argumentative Writing Tasks (RQ1)

Analysis of collaborative discussion transcripts showed that students actively exchanged ideas and proposed initial claims during face-to-face interaction. The discussions were generally cooperative, with learners contributing opinions and responding to their partners' suggestions. However, the interaction primarily focused on generating ideas rather than systematically developing arguments.

One participant described the discussion process as follows:

We just said what we thought without any clear structure. Everyone had their own opinion, and we did not really connect them logically. (P2)

Another participant reported:

We moved quickly from one idea to another, but we did not really develop the arguments in depth. (P5)

These excerpts illustrate that students' discussions mainly involved sharing viewpoints. Although learners occasionally responded to each other's ideas, extended negotiation of counterarguments and rebuttals was limited. Similar interactional patterns were observed across learning environments, as the discussion phase was conducted face-to-face in both conditions.

4.2. Collaborative Writing Processes Across Learning Environments (RQ2)

Differences emerged during the collaborative writing phase across learning environments. In the face-to-face setting, students frequently divided the writing task and composed different sections individually. Interaction mainly occurred during planning, while the actual writing process involved limited joint construction.

An excerpt from a face-to-face collaborative text produced by two participants in the same dyad illustrates this pattern:

Watching TV at school may reduce students' concentration because they may focus more on entertainment than learning. (P1)

Watching TV for long hours can also harm children's health, especially their eyesight. (P2)

These ideas were presented sequentially but showed limited logical development or explicit connections. Interview data further reflected this division-of-labor approach. One participant explained:

We usually wrote our own parts first and then checked each other's sentences. We did not really write together. (P3)

Another participant noted:

I focused on my paragraph, and my partner worked on another part, so we only combined them at the end. (P4)

In contrast, the blended learning environment supported more interactive collaborative writing. Students used Tencent Docs, a shared online document, which allowed them to view and edit each other's contributions in real time. This visibility enabled learners to expand and refine their partner's ideas.

An example from a blended-learning dyad demonstrates this collaborative development:

Watching TV may reduce children's motivation to study because they prefer entertainment. (P5)

Moreover, it also affects their concentration. For example, they may spend too much time watching cartoons instead of doing homework. (P6)

In this case, the second student (P6) elaborated on the initial idea by adding explanation and supporting details. Participants also highlighted the affordances of the shared document:

Because we could see each other's sentences, it was easier to connect our ideas and improve the paragraph together. (P7)

These findings indicate that collaborative writing in the blended environment involved more visible interaction and joint text construction.

4.3. Collaborative Revision Practices Across Learning Environments (RQ2)

Differences were also observed in collaborative revision practices. In the face-to-face setting, revisions mainly focused on surface-level language issues such as grammar, vocabulary, and sentence structure. Students reported limited engagement in revising argument structure or content organization.

One participant stated:

We mainly corrected grammar mistakes like tense or articles, but we did not change the structure. (P1)

Another participant explained:

We only made small changes to words, not to the ideas. (P2)

Because students wrote separate sections, opportunities for jointly revising argument development were limited. As a result, revisions rarely involved reorganizing ideas or adding supporting reasoning.

In contrast, the blended learning environment facilitated more collaborative revision. Students were able to edit each other's contributions directly, which resulted in more frequent modifications to both content and organization. Interview data confirmed this pattern:

When I saw my partner's reasoning online, I could immediately add examples or change the order to make it clearer. (P5)

Another participant noted:

We revised the paragraph together because we could both edit the same document. (P8)

These excerpts indicate that revisions in the blended environment extended beyond language corrections and included collaborative refinement of ideas and structure.

5. Discussion

The present study examined how EFL students collaboratively engaged in argumentative writing tasks and how learning environments mediated their collaborative processes. Overall, the findings suggest that collaboration in this study operated differently across phases. During the face-to-face discussion stage, students were able to generate ideas and exchange viewpoints, but their interaction often remained at the level of opinion sharing rather than systematic argumentative development. More substantial differences emerged during the writing and revision stages, where the two learning environments afforded distinct forms of coordination, visibility, and text construction. In particular, the face-to-face environment tended to produce a division-of-labor pattern, whereas the blended environment supported more visible and interactive co-construction of text. These findings extend previous research by showing that the value of collaborative writing in EFL settings lies not only in whether students collaborate, but also in how the learning environment mediates the transformation of discussion into written argumentation.

5.1. Collaborative engagement in argumentative writing tasks

With regard to RQ1, the findings show that students did engage collaboratively in argumentative writing tasks, but this engagement was uneven across stages. During discussion, students actively exchanged opinions and proposed initial claims, suggesting that collaboration did support idea generation. This finding is consistent with previous research showing that dialogic argumentation can encourage learners to verbalize positions and explore possible ideas before writing (Lam et al., 2018; Matos, 2021; Chen et al., 2016). At the same time, however, the discussions in the present study were often marked by limited elaboration, weak development of counterarguments, and minimal rebuttal work. In this sense, collaboration at the discussion stage appeared to function more as a starting point for content generation than as a fully developed argumentative space.

This pattern can be understood through the Writers-within-Community (WWC) model, which conceptualizes writing as a socially situated activity shaped by interaction with others, tasks, and mediational resources (Graham, 2018). From this perspective, the students' oral discussion did create a community-based space for generating ideas, but that space alone did not automatically lead to well-structured argumentative development. The findings therefore suggest that collaborative engagement should not be treated as a uniform process. Rather, students may participate actively in discussion while still struggling to transform that participation into logically organized claims, counterclaims, and rebuttals. This helps explain why collaboration in EFL writing cannot be assumed to produce high-quality argumentation unless learners are supported in moving from informal idea exchange to more structured textual development.

The findings also help clarify an important issue in previous EFL research. Studies have often emphasized the benefits of collaborative discussion for reasoning and writing (Jin et al., 2020; Su et al., 2021; Storch, 2018; Teng & Huang, 2021), yet less attention has been paid to the possibility that students may collaborate actively without engaging deeply in argumentative reasoning. The present study suggests that collaborative interaction, by itself, is not sufficient. Students may talk, respond, and agree with each other, but still remain at the level of loosely connected opinions. This is particularly relevant in EFL contexts, where learners are simultaneously managing content, language, and interactional demands (Granado-Peinado et al., 2019; Guo et al., 2022; Landrieu et al., 2022). In such contexts, collaborative discussion may reduce some of the burden of individual idea generation, but it does not necessarily ensure deeper argumentative structuring.

5.2. Learning environments and the mediation of collaborative writing

The most important contribution of this study lies in the findings related to RQ2. Although both groups participated in the same face-to-face discussion stage, their collaborative processes diverged clearly during writing. In the face-to-face environment, students tended to divide the task and compose separate sections individually, resulting in a form of parallel writing. In the blended environment, by contrast, students were able to view and modify each other's contributions in a shared online document, which supported more immediate co-construction of ideas and text.

This finding is theoretically significant because it shows that physical learning environments are not passive backdrops, but mediational conditions that reorganize participation and interaction. This interpretation is strongly aligned with the WWC model, which emphasizes that writing development emerges through the interaction of writers with social and material resources in their environment (Graham, 2018). In the face-to-face condition, the lack of a shared visible text during the writing stage appeared to constrain students' ability to jointly build argumentation. Even though they were physically co-present, their collaboration during writing became segmented, with each student managing a separate textual space. In contrast, the blended environment provided a shared textual object that both students could observe and manipulate. This made collaboration more visible, more sustained, and more text-centered.

These findings also extend previous EFL studies on blended and collaborative writing. Earlier research has suggested that blended environments can redistribute students'

attention across discussion and writing phases, and can offer greater opportunities for co-editing and text refinement (Jin et al., 2020; Su et al., 2021; Hassan et al., 2021; Dousti & Amirian, 2023). The present study provides qualitative evidence for how this redistribution happens in practice. What mattered was not simply that students wrote online, but that the shared document enabled them to see each other's developing text, respond to it immediately, and build on it during the writing process. In other words, the blended environment supported not only access, but also mutual visibility and iterative interaction, both of which appeared central to collaborative text construction.

By contrast, the face-to-face environment did not automatically produce stronger collaboration simply because students were physically together. This is an important point. Face-to-face learning is often assumed to facilitate collaboration through immediate verbal interaction and access to non-verbal cues (Jiang et al., 2021; Rouhshad et al., 2016). The present findings suggest that such affordances may indeed support oral discussion, but they do not necessarily extend into the writing phase. Once students move from talking to composing, physical co-presence alone may be insufficient to sustain genuine co-construction, especially when there is no shared textual space that both participants can work on simultaneously. Thus, the learning environment shaped not only where collaboration happened, but also what kind of collaboration became possible.

5.3. Revision as an indicator of collaborative depth

The findings on revision further strengthen this interpretation. In the face-to-face environment, revisions were mainly surface-level, focusing on grammar, vocabulary, and sentence-level adjustments. In the blended environment, however, revision extended beyond language correction to include adding examples, refining claims, and reorganizing ideas. This suggests that the blended condition supported deeper collaborative engagement with the evolving text.

From a sociocultural perspective, revision can be understood as a visible trace of mediation, in which learners externalize, negotiate, and refine meanings through interaction. In the present study, the online document functioned as a mediational artifact that enabled students to revisit and reshape both content and language. This is consistent with research showing that collaborative writing environments can promote recursive drafting and visible revision, especially when learners can access one another's textual moves in real time (Storch, 2018; Teng & Huang, 2021; Hassan et al., 2021). The findings here add a process-oriented explanation: the shared document did not merely record revision; it actively supported it by making the text mutually accessible during composition.

This is also where the difference between the two environments became especially clear. In the face-to-face setting, revision remained limited because students had already divided ownership of the text. Once each student had produced a separate section, subsequent interaction focused largely on polishing local language rather than rethinking the essay as a shared argumentative whole. In the blended environment, by contrast, the text remained open to collective intervention throughout the writing process. Students could add to each other's ideas, restructure reasoning, and adjust coherence while the text was still being formed. This made revision a more substantive and collaborative practice.

Importantly, the findings also show that blended collaboration was not without constraints. Some students reported difficulties related to typing speed, uncertainty about editing others' contributions, and limited familiarity with the online platform. This suggests that the affordances of blended writing are not automatic; they depend partly on learners' digital readiness. Even so, the overall pattern remained clear: compared with the face-to-face environment, the blended environment more strongly supported collaborative revision at both language and argument levels. This helps explain why blended collaborative writing may be particularly valuable in EFL contexts, where students need opportunities to revisit and refine their language and ideas over time.

Taken together, these findings suggest that collaborative argumentative writing in EFL contexts is strongly shaped by the learning environment, particularly in terms of how students jointly construct and revise text. Blended environments appear to provide greater opportunities for sustained interaction, shared visibility, and recursive development of ideas. These process-oriented insights help explain how collaborative writing unfolds in different instructional settings and highlight the importance of designing environments that support not only discussion, but also joint text construction.

6. Conclusion

This study investigated EFL students' collaborative engagement in integrated argumentative writing tasks and examined how learning environments shaped their collaborative processes. The findings showed that students actively exchanged ideas during face-to-face discussion, but their interaction mainly focused on idea generation rather than structured argumentative development. More substantial differences emerged during the writing and revision phases. In the face-to-face environment, students tended to divide the task and compose sections individually, resulting in limited joint construction. In contrast, the blended learning environment supported more interactive collaboration, as students were able to view and edit each other's contributions in a shared online document, which facilitated joint elaboration and revision.

These findings suggest that learning environments play an important role in mediating collaborative argumentative writing. Providing shared writing spaces may help students move beyond simple idea exchange toward more coherent and collaboratively constructed arguments. However, the study focused on a small number of dyads, which may limit the generalizability of the findings. Future research could examine larger samples and longer instructional periods to further explore how collaborative processes influence argumentative writing development.

Ethics Approval and Consent to Participate

This study was approved by the Universiti Malaya Research Ethics Committee (Reference Number: UM.TNC2/UMREC_3526). All procedures involving human participants were conducted in accordance with established ethical guidelines. Informed consent was obtained from all participants, who were assured of their anonymity and that all data would be kept confidential. Participation was voluntary, and participants were free to withdraw at any time without any consequences.

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Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this study.

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