

From Collaborative Inquiry to Individual Writing: Developing EFL Students' Expository Writing through Digital-Supported Learning

Wienda Gusta¹, Dwi Megista Putri²

¹ Lecturer, Faculty of Computer Science, Universitas Putra Indonesia YPTK Padang, Padang, West Sumatra, Indonesia.

² Lecturer, Faculty of Teacher Training and Education, Universitas Putra Indonesia YPTK Padang, Padang, West Sumatra, Indonesia.

¹wienda84@yahoo.com, ²dwi_megista@upiypk.ac.id

Abstract—

This quasi-experimental study investigated whether digitally supported collaborative inquiry was associated with improvement in individual expository writing among university students learning English as a foreign language (EFL). Seventy-three students enrolled in Writing II at Universitas Putra Indonesia YPTK Padang participated in two intact classes: an experimental class ($n = 35$) and a control class ($n = 38$). Across four weeks, the experimental condition combined collaborative topic investigation, organization of information, individual drafting, peer response, and revision, whereas the control class received regular writing instruction. Individual pre-test and post-test essays addressed the prompt “Explain the use of AI in university learning.” Scores were evaluated using descriptive statistics and non-parametric comparisons. Mean scores increased from 66.71 to 79.00 in the experimental group and from 68.68 to 75.39 in the control group. The difference in gain-score distributions was significant (Mann-Whitney $U = 988.50$, $p < .001$), with rank-biserial correlation of .486 favoring the experimental group. Findings suggest that linking shared inquiry to individually authored texts may support EFL expository writing development. Because classes were not randomized and multiple instructional components were combined, the results should be interpreted as an association rather than definitive causal evidence.

Keywords—expository writing; collaborative inquiry; EFL; digital-supported learning; peer feedback; individual authorship

I. INTRODUCTION

Writing is widely recognized as an essential component of academic literacy in higher education because it enables students to communicate knowledge, develop ideas, and demonstrate their understanding of disciplinary concepts through structured written discourse. For university students learning English as a foreign language (EFL), however, writing involves a complex interaction of linguistic, cognitive, and organizational processes that cannot be developed solely through grammatical instruction. Students must generate relevant content, select appropriate information, organize ideas logically, and express relationships among concepts while simultaneously attending to vocabulary, sentence construction, and textual coherence. These demands become particularly challenging when learners are expected to produce extended academic texts independently, as they must coordinate the processes of knowledge construction and linguistic expression without immediate assistance from others. Recent research has increasingly emphasized the importance of learning environments that integrate cognitive engagement, social interaction, and technology-supported activities to address these challenges. Studies on technology-enhanced collaborative writing suggest that interaction among learners can support writing development by providing opportunities

for idea generation, meaning negotiation, and shared problem-solving (Zou et al., 2023; Kılınç & Yüksel, 2024). Nevertheless, the effectiveness of these learning experiences depends on how collaboration is organized and how students are supported in transferring knowledge developed through interaction into independently produced texts.

Among the various genres encountered in university writing courses, expository writing occupies an important position because it requires students to communicate information and explain concepts, processes, or phenomena in a clear and logically organized manner. Unlike argumentative writing, which emphasizes the establishment and defense of a particular position, expository writing focuses primarily on explaining information and developing readers' understanding of a topic. Producing an effective expository essay therefore requires students to establish a clear controlling idea, select relevant supporting information, develop explanations sufficiently, and arrange ideas into a coherent textual structure. For EFL learners, these requirements may create difficulties because the ability to explain a topic depends not only on linguistic proficiency but also on the availability and organization of conceptual knowledge. Students who possess limited information about a topic may struggle to elaborate their ideas, while those who collect substantial information may still experience difficulty identifying

relationships among concepts and transforming them into meaningful written explanations. Consequently, expository writing instruction needs to provide opportunities for learners to construct and organize knowledge before they begin drafting. This perspective is consistent with inquiry-oriented approaches to writing, which emphasize the importance of active information exploration, conceptual understanding, and knowledge construction as foundations for effective text production (Wale & Bogale, 2021; Adhami & Taghizadeh, 2022).

One instructional approach that may address these challenges is collaborative inquiry, in which students work together to investigate a topic, identify relevant information, discuss findings, and construct shared understanding before completing an individual learning task. Collaborative inquiry differs from conventional group writing because its primary purpose is not necessarily to produce a jointly authored text but to create opportunities for students to develop the conceptual resources required for subsequent independent performance. Through collaborative investigation, learners can exchange perspectives, clarify unfamiliar concepts, compare information obtained from different sources, and identify relationships that may not have been apparent during individual exploration. These processes are particularly relevant to expository writing because students need sufficient conceptual understanding to construct explanations that are accurate, informative, and coherent. When inquiry activities are followed by explicit knowledge organization, learners may enter the drafting stage with a clearer understanding of what they intend to communicate and how the information should be structured. Research examining inquiry-based and collaborative learning has demonstrated the potential of such approaches to strengthen students' academic writing performance by connecting information investigation with meaningful learning activities (Adhami & Taghizadeh, 2022; Huang et al., 2024). However, the contribution of collaborative inquiry to independently assessed expository writing remains an area requiring further empirical attention.

The growing integration of digital technology into higher education provides additional opportunities to support collaborative inquiry and writing development. Digital environments allow students to access information, share resources, organize ideas, exchange feedback, and revise written texts through platforms that facilitate interaction and documentation of the writing process. In EFL writing instruction, these opportunities are particularly valuable because learners can engage with information and receive responses from peers beyond the limitations of conventional classroom discussion. Kılınç and Yüksel (2024) found that online collaborative writing contributed to selected dimensions of EFL writing performance,

suggesting that digitally mediated interaction can support language development when appropriately integrated into instructional activities. Similarly, Zou et al. (2023) demonstrated that technology-enhanced feedback arrangements can influence collaborative writing, critical thinking, and student engagement, although their effects may differ according to the type of feedback provided. These findings indicate that digital technology should not be regarded as an independent instructional solution. Its pedagogical value depends on whether the activities it supports encourage learners to engage meaningfully with information, collaborate productively, and apply their developing understanding during text production.

In addition to supporting information exploration and collaborative planning, digital technology can facilitate peer feedback, which constitutes an important component of process-oriented writing instruction. Peer feedback provides opportunities for students to evaluate written texts from a reader's perspective, identify areas requiring clarification, and reconsider the organization and development of their ideas. For the writer, receiving feedback can reveal discrepancies between intended meaning and communicated meaning, while providing feedback requires students to apply evaluative criteria and make judgments about the effectiveness of another learner's text. A meta-analysis conducted by Vuogan and Li (2023) demonstrated that peer feedback had a positive overall effect on second-language writing development, with particularly relevant implications for content-related aspects of writing. Other studies have similarly emphasized the potential of structured peer response to promote engagement, revision, and greater awareness of writing quality (Gao et al., 2023; He & Gao, 2023). These findings suggest that peer feedback can contribute to writing development when students receive sufficient guidance and are encouraged to use comments critically rather than treating feedback as corrections that must automatically be accepted. Within an instructional sequence that begins with collaborative inquiry and progresses toward individual drafting, peer response may provide a further opportunity for social interaction without removing the learner's responsibility for the final written product.

Despite the growing body of research on collaborative writing, technology-enhanced learning, and peer feedback, an important pedagogical distinction remains insufficiently addressed. Much of the existing literature examines collaboration during the production of a shared text or investigates digital platforms as environments for joint writing activities. Although these studies provide valuable evidence concerning the benefits of interaction, improvements in collaboratively produced texts do not necessarily demonstrate that individual learners have

developed equivalent writing competence. This distinction is particularly important in higher education, where collaborative learning is frequently encouraged but academic writing performance is commonly evaluated through individual assignments. Recent research has begun to examine the relationship between digital collaborative writing and learners' capacity to regulate writing processes, indicating that collaboration can support broader dimensions of writing development (Pan & Teng, 2025). Nevertheless, further investigation is needed to understand how collaborative knowledge construction can be systematically connected to independent text production, particularly in expository writing tasks that require students to explain information rather than defend argumentative positions.

The present study addresses this issue by examining digital-supported collaborative inquiry as an instructional sequence that connects collaborative information exploration, knowledge organization, individual drafting, peer feedback, and revision. The central assumption underlying this approach is that collaboration can serve as temporary pedagogical support through which students develop conceptual understanding and organizational resources before assuming individual responsibility for writing. Rather than treating collaborative learning and independent writing as competing instructional practices, the study positions them as complementary stages within a coherent learning process. Digital resources are integrated to facilitate information investigation and interaction, while individual drafting and revision ensure that students remain accountable for constructing their own texts. The study was conducted in a university Writing II course and focused on students' ability to produce expository essays concerning the use of artificial intelligence in university learning. By comparing the development of students receiving digital-supported collaborative inquiry with that of students participating in regular writing instruction, the study seeks to contribute empirical evidence concerning the potential of collaborative knowledge construction to support independent expository writing.

Accordingly, the study was guided by two research questions: (1) How does digital-supported collaborative inquiry contribute to university EFL students' expository writing development? and (2) Is the improvement in expository writing significantly different between students receiving digital-supported collaborative inquiry and those receiving regular writing instruction?

II. METHOD

Research Design and Participants

This study employed a quasi-experimental pre-test-post-test control-group design to investigate the contribution of

digital-supported collaborative inquiry to university EFL students' expository writing development. The design was selected because the participants belonged to existing university classes, making individual random assignment impractical within the regular instructional setting. The research was conducted at Universitas Putra Indonesia YPTK Padang, Indonesia, involving 73 students enrolled in the Writing II course. The experimental group consisted of 35 students, while the control group comprised 38 students. Both groups completed an individual expository writing pre-test before the instructional period and a post-test after the intervention. The experimental group received digital-supported collaborative inquiry instruction, whereas the control group participated in regular Writing II instruction. Maintaining the existing class configurations allowed the study to be implemented within the university's established teaching arrangements while providing an opportunity to compare changes in writing performance under two instructional conditions. Because the groups were not formed through random assignment, the findings were interpreted with consideration of the limitations associated with quasi-experimental research.

Instructional Treatment

The instructional treatment was implemented over four consecutive weeks, comprising four instructional meetings. The experimental instruction was designed to connect collaborative knowledge construction with individual expository writing through a sequence of interrelated learning activities. At the beginning of the instructional process, students explored the assigned topic and identified the information required to develop a meaningful explanation. They subsequently worked collaboratively to investigate relevant information using digital resources, including Google Scholar, which provided access to academic materials related to the topic. During this stage, students were encouraged to examine the relevance of the information obtained, discuss different perspectives, and identify concepts that could contribute to their explanations. Collaborative investigation was followed by knowledge organization, during which students arranged the information collected into central ideas, supporting details, and logical relationships among concepts. This stage was particularly important because it provided an opportunity for students to transform information gathered during inquiry into an organized conceptual structure before beginning individual writing.

Following collaborative inquiry and knowledge organization, students moved to individual drafting, during which each learner independently constructed an expository essay using the conceptual resources developed through the preceding activities. Although the students had participated in collaborative investigation and discussion, responsibility for producing the written text remained with each individual learner. After completing their drafts, students exchanged their writing for peer feedback using Google Docs. The feedback process encouraged students to evaluate the clarity, relevance, development, and organization of ideas, allowing writers to reconsider their texts from the perspective of potential readers. Students subsequently

revised their essays individually by evaluating the comments received and making appropriate changes to their writing. Through this sequence, collaboration was concentrated at stages where interaction could support information exploration, knowledge construction, and evaluation, while individual drafting and revision preserved personal responsibility for the final written product. The control group received regular Writing II instruction during the same four-week period, without the structured collaborative inquiry sequence implemented in the experimental class.

Research Instrument and Data Collection

Students' expository writing performance was assessed through an individual essay-writing test administered before and after the instructional period. The writing prompt used in both assessments was "Explain the use of AI in university learning." This topic was selected because artificial intelligence has become increasingly relevant to university students' learning experiences and provides opportunities for explaining technological functions, educational applications, benefits, challenges, and implications within an academic context. The task was designed to elicit explanatory rather than argumentative writing, requiring students to communicate information through a focused and logically organized essay. Students completed the assessment individually so that the resulting scores reflected their own writing performance rather than collaboratively produced texts. The same general assessment requirements were applied to both groups, and the resulting scores were used to examine changes in writing performance across the instructional period.

The writing assessment was conducted by a university lecturer experienced in teaching writing at a higher education institution different from the research site. The involvement of an external assessor was intended to reduce direct instructional influence on the scoring process. An analytic expository-writing rubric covering focus and controlling idea, development and supporting information, organization, coherence and cohesion, and language use is proposed as the framework for documenting the assessment criteria. However, these dimensions must be checked against the rubric actually applied by the external assessor, as the available score file contains total pre-test and post-test scores but does not provide the original scoring sheets or dimension-level results. Because the assessment involved a single external scorer, inter-rater reliability could not be calculated. This limitation was considered when interpreting the findings. Data collection consisted of three principal stages: administration of the pre-test, implementation of the instructional conditions over four weeks, and administration of the post-test. The scores obtained from both assessments constituted the quantitative data-set used in the analysis.

Data Analysis

The quantitative data were analyzed using descriptive and inferential statistical procedures. Descriptive statistics were first calculated to summarize the pre-test, post-test, and gain scores of the experimental and control groups. Individual gain scores were obtained by subtracting

each student's pre-test score from the corresponding post-test score, allowing the analysis to focus on changes in writing performance during the instructional period. Before conducting the principal between-group comparison, the distributional characteristics of the data were examined using the Shapiro–Wilk test. Because the gain-score distributions departed significantly from normality, a non-parametric statistical procedure was selected. The Mann–Whitney U test was used to determine whether the distributions of improvement scores differed significantly between the experimental and control groups. Statistical significance was evaluated at an alpha level of .05, and rank-biserial correlation was used to describe the magnitude and direction of the between-group difference. The analysis focused primarily on gain scores because the central research question concerned differences in improvement rather than differences in post-test performance alone.

Ethical Considerations

Institutional permission to conduct the research was obtained through an official research permission letter approved by the head of the relevant study program at Universitas Putra Indonesia YPTK Padang. The permission provided institutional authorization for conducting the research within the Writing II course. No separate research ethics committee approval number is reported because the authorization described for this study took the form of institutional research permission. The final manuscript should additionally document the actual procedures used to inform participants about the research, obtain any required consent, and protect students' identities and assessment data.

III. FINDINGS AND DISCUSSION

Students' Expository Writing Performance

The descriptive analysis revealed that both experimental and control groups demonstrated improvement in expository writing performance following the four-week instructional period, although the magnitude of improvement differed considerably between the two groups. As presented in Table 1, the experimental group obtained a pre-test mean of 66.71 and a post-test mean of 79.00, resulting in an average gain of 12.29 points. In comparison, the control group obtained a pre-test mean of 68.68 and a post-test mean of 75.39, producing an average gain of 6.71 points. An important pattern can be observed in these results: although the experimental group began the study with a slightly lower mean score than the control group, it achieved a higher mean score after the instructional period. The difference in average improvement between the two groups was approximately 5.58 points in favor of the experimental group. These findings suggest that students receiving digital-supported collaborative inquiry experienced greater development in expository writing performance than those participating in regular Writing II instruction. Nevertheless, the improvement observed in both groups indicates that writing development also occurred under the regular instructional condition, making it important to distinguish the general effects of participation

in writing instruction from the additional improvement associated with the experimental learning sequence.

Table 1. Descriptive Statistics of Students' Expository Writing Scores

Group	N	Pre-test Mean	Post-test Mean	Mean Gain
Experimental	35	66.71	79.00	12.29
Control	38	68.68	75.39	6.71

A preliminary comparison of pre-test performance indicated that the two groups did not demonstrate a statistically significant difference before the instructional period. This result suggests that the initial writing-score distributions were not detectably different, although it does not establish complete equivalence between the groups because the participants were not randomly assigned. The principal analysis subsequently focused on gain scores, which represented the magnitude of change in students' writing performance between the pre-test and post-test. Because the gain-score distributions did not satisfy the normality assumption, the Mann-Whitney U test was employed to compare improvement between the experimental and control groups. The analysis revealed a statistically significant difference in gain scores, with the experimental group demonstrating greater improvement than the control group ($U = 988.50$, $p < .001$). The rank-biserial correlation of approximately .486 further indicated a meaningful difference in the relative distributions of improvement scores. Taken together, the descriptive and inferential findings provide evidence that participation in digital-supported collaborative inquiry was associated with stronger development in expository writing during the four-week instructional period.

Table 2. Mann-Whitney U Test of Gain Scores

Comparison	U	p	Rank-biserial correlation
Experimental vs. control	988.50	$< .001$	.486

Collaborative Inquiry and the Development of Expository Writing

The greater improvement observed in the experimental group may be interpreted in relation to the opportunities for knowledge construction provided through collaborative inquiry. Expository writing requires students to explain information clearly, which means that the quality of a written explanation depends partly on the writer's understanding of the topic being discussed. When students begin drafting with limited conceptual knowledge, they may struggle to generate sufficient content, elaborate supporting information, and establish meaningful relationships among ideas. The experimental instructional sequence attempted to address these difficulties by providing opportunities for students to investigate information collaboratively before beginning individual writing. Through discussion and shared exploration, students could compare information, clarify unfamiliar concepts, and identify relevant details that

might otherwise have remained underdeveloped. This interpretation is consistent with inquiry-based writing research demonstrating that active investigation and knowledge construction can contribute to academic writing development (Wale & Bogale, 2021; Adhami & Taghizadeh, 2022). More recent research has also emphasized the value of integrating inquiry-oriented activities with technology-supported writing instruction, suggesting that meaningful engagement with information can strengthen students' preparation for written communication (Huang et al., 2024). Although the present study did not directly measure students' conceptual understanding during inquiry, the stronger improvement in the experimental group is consistent with the possibility that collaborative investigation provided additional resources for subsequent individual writing.

Another important feature of the experimental instruction was the explicit organization of information before drafting. Access to information does not necessarily enable students to construct coherent explanations because writers must also determine which ideas are central, which details provide support, and how different pieces of information should be connected. Students who collect information without organizing it may produce texts containing relevant but disconnected ideas, reducing the clarity and effectiveness of their explanations. The knowledge-organization stage provided an opportunity for students to discuss relationships among concepts and establish a preliminary structure for their essays before translating those ideas into English. In this respect, collaborative inquiry was not limited to gathering information but extended to the interpretation and organization of knowledge. This distinction is relevant to expository writing because explanatory texts depend on the logical development of information rather than the accumulation of isolated facts. Research on collaborative and technology-supported writing has indicated that interaction can facilitate the development of writing-related processes, although the benefits may vary across different dimensions of performance (Kılınç & Yüksel, 2024; Nguyen & Vu, 2024). The present findings extend this discussion by suggesting that collaborative knowledge organization may provide useful preparation for individually assessed expository writing, while recognizing that the available data do not permit direct measurement of improvement in organization as a separate writing dimension.

The Transition from Collaborative Learning to Individual Authorship

A central contribution of the study concerns the distinction between collaborative learning and collaborative authorship. In many collaborative writing arrangements, students jointly plan, draft, and revise a single text, making the final product the outcome of shared authorship. Although such arrangements can support interaction and language learning, the quality of a jointly produced text does not necessarily demonstrate the writing competence of each individual participant. The instructional sequence examined in the present study followed a different approach

by concentrating collaboration during information investigation and knowledge organization while requiring students to produce their assessed essays independently. This arrangement allowed students to benefit from shared learning experiences without transferring responsibility for the final written product to the group. Recent research has demonstrated that digitally mediated collaboration can support writing development and the regulation of learning processes (Pan & Teng, 2025), while other studies have shown that interaction and feedback can contribute to students' engagement with academic writing tasks (Zhang et al., 2023). The present study contributes to this discussion by emphasizing the possibility that collaboration can function as temporary pedagogical support leading toward independent performance.

The progression from collaborative inquiry to individual writing is particularly relevant in university contexts because students are expected to participate in collaborative learning while also demonstrating individual academic competence. During collaborative investigation, learners can distribute some of the cognitive demands of exploring and understanding information across group interaction. During knowledge organization, they can negotiate relationships among ideas and develop a clearer representation of the topic. However, when the drafting stage begins, each student must independently select appropriate information, determine how ideas should be expressed, and construct a coherent written explanation. The instructional sequence therefore creates a gradual shift from socially supported knowledge construction toward individual responsibility for text production. This shift is important because collaboration becomes a means of developing resources for writing rather than a substitute for writing itself. The significantly greater improvement observed in the experimental group suggests that this arrangement may be beneficial for expository writing development, although further process-oriented research is required to establish how particular collaborative interactions contribute to individual textual decisions.

Peer Feedback and Writing Revision

Peer feedback constituted another important component of the instructional sequence because it provided students with opportunities to reconsider their individual drafts through interaction with other readers. Writing is not completed when an initial draft has been produced; effective writing development also requires learners to evaluate the clarity, relevance, and organization of their texts and make revisions that improve communication. For EFL learners, this process can be demanding because writers may find it difficult to identify weaknesses in their own explanations while simultaneously attending to linguistic accuracy. Peer feedback can provide an alternative perspective by making visible how another reader interprets the text and which parts of the explanation require further clarification. Vuogan and Li (2023), in their meta-analysis of second-language writing research, reported a positive overall effect of peer feedback on writing development, supporting its potential contribution to classroom writing instruction. Similarly, Gao et al. (2023) found that providing and receiving peer

feedback can generate benefits for learners, while He and Gao (2023) emphasized the importance of feedback quality and its relationship with implementation during revision. These findings suggest that peer response can support writing development when students are encouraged to engage meaningfully with comments rather than treating feedback as a mechanical correction activity.

In the present study, peer feedback was positioned after individual drafting so that collaboration supported evaluation and revision without replacing independent authorship. Students first constructed their own explanations and subsequently received responses that could help them reconsider the effectiveness of their writing. This arrangement required learners to evaluate feedback and make individual decisions concerning revision, thereby maintaining responsibility for the final text. The digital environment also provided opportunities for feedback to be communicated through written comments that students could revisit during revision. Research on technology-enhanced feedback has indicated that digital interaction can support engagement and writing development when feedback activities are appropriately structured (Zou et al., 2023; Tran & Ma, 2024). Nevertheless, the present study did not collect separate measures of feedback quality, revision behavior, or students' responses to peer comments. Consequently, peer feedback should be interpreted as one component of the instructional sequence rather than as an independently verified explanation for the observed improvement. Future research could examine feedback exchanges and revision histories to determine how students use peer responses when transforming initial drafts into more developed expository texts.

Digital Technology as Pedagogical Support

The findings also contribute to discussions concerning the role of digital technology in university EFL writing instruction. Digital resources can facilitate access to information, support collaborative interaction, and provide environments in which drafts and feedback can be exchanged efficiently. However, the educational contribution of technology should not be understood solely in terms of the availability of digital applications. Students may have access to extensive online information without developing the ability to evaluate its relevance, and they may use shared documents without engaging in meaningful collaboration. The instructional value of technology therefore depends on how digital activities are connected to specific learning objectives and cognitive processes. In the present study, Google Scholar supported information investigation, while Google Docs facilitated collaborative planning, feedback exchange, and revision. These applications were not introduced as independent learning outcomes but as resources supporting the broader instructional sequence. This interpretation is consistent with research showing that technology-enhanced collaborative writing and feedback can contribute to writing development when embedded within structured pedagogical activities (Zou et al., 2023; Kılınç & Yüksel, 2024).

The relationship between digital technology and writing development is particularly important when students

are asked to explain contemporary topics that require access to relevant information. The writing task used in this study, “Explain the use of AI in university learning,” required students to communicate their understanding of a topic closely connected to current educational practices. Through digital-supported inquiry, students had opportunities to explore information related to the topic before constructing their individual explanations. Nevertheless, the observed improvement cannot be attributed exclusively to the use of Google Scholar or Google Docs because the intervention integrated several components, including collaborative investigation, knowledge organization, individual drafting, peer feedback, and revision. The findings therefore support a broader pedagogical interpretation: digital technology may contribute to writing development when it enables students to engage more effectively in learning processes that are directly relevant to the construction of written texts. This perspective is consistent with contemporary research emphasizing the importance of integrating technology with meaningful writing activities rather than assuming that digital participation automatically produces better learning outcomes (Huang et al., 2024; Pan & Teng, 2025).

Pedagogical Implications and Limitations

The findings offer several implications for university EFL writing instruction. First, writing instruction may benefit from providing structured opportunities for students to investigate and understand a topic before beginning individual drafting. This is particularly important for expository writing, where the quality of explanation depends on the availability and organization of relevant information. Second, teachers should distinguish information collection from knowledge organization because students need to establish meaningful relationships among ideas before communicating those relationships through written discourse. Third, collaborative learning can be strategically positioned during preparatory stages without requiring students to produce every text collaboratively. This arrangement allows students to benefit from interaction while maintaining individual responsibility for academic writing. Fourth, peer feedback can provide opportunities for students to evaluate the communicative effectiveness of their writing and make informed revision decisions. Finally, digital tools should be selected according to their instructional functions, particularly their capacity to support inquiry, interaction, feedback, and revision. These implications are consistent with research emphasizing the value of structured collaboration and technology-supported feedback in EFL writing development (Vuogan & Li, 2023; Zou et al., 2023; Kılınç & Yüksel, 2024).

Despite these contributions, several limitations should be considered when interpreting the findings. The study involved 73 students from two intact classes at a single university, which limits the generalizability of the results to other institutional contexts. The four-week instructional period was relatively short, and the absence of a delayed post-test means that the durability of the observed improvement remains unknown. In addition, the essays were evaluated by a single external assessor, preventing the calculation of inter-rater reliability. The intervention also

combined several instructional components, making it impossible to determine the independent contribution of collaborative inquiry, digital resources, peer feedback, or revision. Furthermore, the available dataset contained total writing scores rather than separate scores for individual assessment dimensions, limiting the extent to which the study could explain the specific aspects of expository writing that improved. The use of the same writing topic in the pre-test and post-test may also have introduced task-familiarity effects. Future research could address these limitations by incorporating larger samples, multiple assessors, longer instructional periods, delayed post-tests, dimension-level scoring, and qualitative analyses of collaborative interaction and revision processes.

IV. CONCLUSION

This study investigated the contribution of digital-supported collaborative inquiry to university EFL students’ expository writing development through a four-week quasi-experimental intervention. The findings demonstrated that students in both experimental and control groups improved their writing performance, but the experimental group achieved substantially greater improvement. Students receiving digital-supported collaborative inquiry obtained an average gain of 12.29 points, compared with 6.71 points among students receiving regular Writing II instruction. The statistically significant difference in gain scores suggests that the experimental instructional sequence was associated with stronger development in expository writing performance. The findings highlight the pedagogical importance of connecting collaborative information investigation and knowledge organization with individual drafting, peer feedback, and revision. Rather than positioning collaboration as a substitute for individual writing, the study demonstrates the potential value of using social learning processes to prepare students for independent text production. Digital technology contributed to this instructional arrangement by supporting information access, collaborative interaction, and feedback exchange within a coherent learning sequence. Although the findings should be interpreted within the limitations of the quasi-experimental design, the study suggests that digital-supported collaborative inquiry offers a promising approach to developing expository writing in university EFL contexts. Future research should investigate the processes through which collaboratively constructed knowledge is transferred into individual writing and examine whether similar benefits can be sustained across different writing tasks and instructional settings.

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