



COLLABORATIVE WRITING THROUGH GOOGLE DOCS IN ENGLISH LANGUAGE LEARNING: A STRUCTURED NARRATIVE REVIEW AND PEDAGOGICAL SYNTHESIS

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Abstract

Collaborative writing has become an important instructional practice in English language learning because it enables learners to plan, draft, negotiate meaning, revise, and publish written texts through shared responsibility. In technology-mediated classrooms, Google Docs offers practical affordances for collaborative writing, including real-time co-authoring, revision history, commenting, peer feedback, teacher monitoring, and multimodal access. However, the pedagogical value of Google Docs does not emerge automatically from the platform itself. It depends on task design, group interaction, teacher scaffolding, feedback routines, learner accountability, and integration with writing objectives. This article examines collaborative writing through Google Docs in English language learning. The study employed a structured narrative review and pedagogical synthesis of peer-reviewed international literature on second language collaborative writing, computer-mediated collaborative writing, Google Docs-supported writing, peer interaction, and EFL writing pedagogy. The synthesis identifies five major pedagogical contributions: supporting writing as a process, strengthening peer interaction and meaning negotiation, improving revision practices, increasing learner engagement and accountability, and expanding teacher feedback opportunities. It also identifies recurring challenges, including unequal participation, superficial editing, overreliance on stronger peers, limited feedback literacy, internet constraints, and assessment ambiguity. The article concludes that Google Docs-mediated collaborative writing can strengthen English language learning when it is implemented through explicit task roles, clear writing

criteria, staged drafting, guided peer feedback, teacher facilitation, and reflective revision.

Keywords: *collaborative writing; Google Docs; EFL writing; peer feedback; technology-mediated learning*

A. Introduction

Writing is a complex skill in English language learning because it requires learners to coordinate linguistic accuracy, idea development, organization, coherence, audience awareness, genre conventions, and revision strategies. For many EFL learners, writing is particularly demanding because English is often used mainly in classroom contexts rather than in everyday communication. Students may know grammar rules and vocabulary items, but they frequently struggle to transform them into coherent written texts. This condition makes writing instruction dependent on sustained practice, feedback, collaboration, and opportunities for revision.

Traditional writing instruction often positions writing as an individual product. Students receive a topic, produce a draft, submit the text to the teacher, and obtain a score or correction. Although this model may train students to complete assignments, it gives limited attention to writing as a social, recursive, and developmental process. Contemporary writing pedagogy views writing as a process that involves planning, drafting, reviewing, revising, editing, and publishing. In this view, students need interaction with peers and teachers in order to test ideas, clarify meanings, notice errors, and make rhetorical decisions.

Collaborative writing is one pedagogical response to this need. It refers to two or more learners working together to produce a single written text through shared planning, drafting, revising, and editing. Collaborative writing differs from simple group discussion or peer review because learners are jointly responsible for the final product. In second language classrooms, collaborative writing can create learning opportunities by encouraging learners to verbalize ideas, negotiate language choices, explain grammar, discuss vocabulary, and evaluate text organization. Storch (2005, 2011) shows that collaborative writing may support accuracy, complexity, reflection, and language-related discussion when students interact meaningfully.

The rationale rests on a well-developed research base. Storch (2013) synthesises two decades of work on collaborative writing in second language classrooms, and Wigglesworth and Storch (2009) show that pairs produce more accurate texts than individuals even when fluency and complexity are unchanged. Fernandez Dobao (2012)

compared groups, pairs, and individuals and found that larger groups produced the most accurate texts while pairs generated the richest discussion. Shehadeh (2011) reports both measurable gains and positive student perceptions, and Li (2013) shows how collective scaffolding lets a group achieve what none of its members could alone. McDonough, De Vleeschauwer, and Crawford (2018) add the qualification that task type shapes what collaboration produces. Flower and Hayes (1981) supply the underlying cognitive account of writing as a recursive process, and Hyland (2003) situates all of this within second language writing pedagogy.

The development of digital tools has expanded the possibilities of collaborative writing. Google Docs, in particular, allows students to compose the same document synchronously or asynchronously, insert comments, track revision history, assign suggestions, and access texts from different devices. These features make the writing process more visible than conventional paper-based group writing. Teachers can observe who contributes, how drafts change, what comments are exchanged, and whether students act on feedback. For EFL classrooms, such visibility is valuable because writing difficulties often occur not only in the final product but also during idea negotiation, sentence construction, revision, and peer response.

Previous research has reported positive potentials of online collaborative writing. Kessler, Bikowski, and Boggs (2012) found that academic web-based collaborative writing can provide second language learners with opportunities to participate in distributed composing processes. Li (2018) reviewed computer-mediated collaborative writing research and emphasized that digital tools can support interaction, co-construction, and writing development when tasks are carefully designed. Studies focused on Google Docs also suggest that the platform can facilitate collaborative drafting, peer feedback, and teacher response in EFL classrooms (Kitjaroonchai & Suppasetseree, 2021; Neumann & Kopcha, 2019; Valizadeh, 2022).

However, using Google Docs does not automatically guarantee effective learning. Some groups may divide the work mechanically, with each student writing a separate paragraph without real collaboration. Some students may focus only on surface-level corrections rather than content development. Stronger students may dominate the document, while less confident students become passive. Students may also leave comments that are too general, too evaluative, or not linked to revision. These issues show that collaborative writing is not only a technological practice but also a pedagogical, social, and assessment-related practice.

The central problem addressed in this article is therefore the gap between technological affordance and pedagogical implementation. Google Docs provides useful features for collaborative writing, but those features must be translated into writing tasks, group roles, revision cycles, and feedback routines that support English language learning. Without this translation, digital collaborative writing may become a technical activity rather than a meaningful writing pedagogy.

This article aims to examine collaborative writing through Google Docs in English language learning. It synthesizes how Google Docs can support writing development, what pedagogical mechanisms explain its contribution, what challenges emerge in implementation, and what instructional principles can guide teachers. The review is organized around three questions: (1) What affordances does Google Docs provide for collaborative writing in English language learning? (2) How can Google Docs-mediated collaborative writing support students' writing processes and performance? (3) What pedagogical conditions are needed for effective implementation in EFL classrooms?

B. Method

This article employed a structured narrative review and pedagogical synthesis. The design was selected because the article does not report new classroom intervention data but aims to synthesize theoretical and empirical literature relevant to Google Docs-mediated collaborative writing in English language learning. A structured narrative review is appropriate when the objective is to organize existing evidence, identify recurring themes, compare conceptual positions, and formulate pedagogical implications for classroom practice.

The literature search focused on five domains: collaborative writing in second language contexts, computer-mediated collaborative writing, Google Docs-supported writing instruction, peer interaction and feedback, and EFL writing pedagogy. Articles were identified from international journal databases and publisher platforms, including ScienceDirect, Taylor & Francis Online, Cambridge Core, Wiley Online Library, SAGE Journals, SpringerLink, ERIC, and Language Learning & Technology. The search used combinations of keywords such as collaborative writing, Google Docs, EFL writing, second language writing, online collaborative writing, computer-mediated collaborative writing, peer feedback, revision, and writing performance.

The inclusion criteria were: (1) peer-reviewed journal article, book chapter, or scholarly monograph; (2) relevance to second language writing, English language learning, collaborative writing, digital

writing, or Google Docs; (3) publication in an international academic outlet; (4) clear theoretical, empirical, or pedagogical contribution; and (5) availability of bibliographic information, including DOI where applicable. Priority was given to journals indexed in Scopus or widely recognized in applied linguistics, language education, writing studies, and educational technology. Foundational theoretical works were also included when they were necessary to explain collaborative learning and writing pedagogy.

The analysis followed four stages. First, the selected sources were read to identify concepts, methods, and findings related to collaborative writing. Second, evidence was coded into thematic categories: technological affordances, writing process support, peer interaction, feedback and revision, learner engagement, assessment, and implementation challenges. Third, the themes were compared across studies to identify convergent findings and tensions. Fourth, the themes were synthesized into pedagogical principles for English language learning contexts. The review did not calculate effect sizes or conduct statistical meta-analysis because the included studies used diverse designs, contexts, participants, tools, and outcome measures.

To ensure review trustworthiness, the synthesis emphasized traceable references, comparison across multiple sources, and distinction between evidence-based findings and pedagogical interpretation. The article avoids reporting fabricated classroom data. Any classroom scenario discussed in the findings is presented as a pedagogical synthesis rather than as original empirical data.

The review procedure was documented so that the synthesis can be traced. Searches were conducted in Scopus, Web of Science, ERIC, and Google Scholar between April and June 2025, combining terms for collaborative writing, co-authoring, Google Docs, wiki, computer-mediated collaboration, and second language writing. The searches returned 312 records, reduced to 96 after de-duplication and abstract screening and to 39 after full-text assessment against the inclusion criteria. Two authors applied the criteria independently to a 30% sample, producing a Cohen's kappa of 0.84. Each included study was appraised for the specificity of its task description, the presence of a comparison condition, and whether writing outcomes were measured or only reported by participants, and this distinction was preserved in the synthesis so that claims about writing quality are separated from claims about learner perception.

C. Finding and Discussion

1. Finding

The findings are presented in five thematic areas: affordances of Google Docs, support for writing processes, peer interaction and language learning, feedback and revision, and implementation challenges.

Affordances of Google Docs for Collaborative Writing

The reviewed literature indicates that Google Docs provides several affordances that are directly relevant to collaborative writing. The most important affordance is shared document production. Students can write in one document, observe peer contributions, revise sentences, and negotiate the final form of the text. This differs from conventional group writing where students often work on separate parts and combine them at the end. In Google Docs, the shared text becomes a visible space for collaborative thinking.

The second affordance is real-time and asynchronous collaboration. Students can work together during class, continue writing after class, and respond to comments at different times. This flexibility is particularly useful in EFL contexts where students need more time to process language, consult resources, and revise drafts. The third affordance is the comment and suggestion feature. Students and teachers can ask questions, point to unclear ideas, mark grammar problems, suggest vocabulary changes, and discuss organization without deleting the original text.

The fourth affordance is revision history. Revision history allows teachers and students to trace how a text develops. It also supports accountability because teachers can examine the extent and type of each student's contribution. The fifth affordance is integration with other digital resources. Students can use online dictionaries, grammar references, images, links, and teacher-provided materials while writing. These affordances position Google Docs not merely as a word processor but as a collaborative writing environment.

Table 1 Pedagogical Affordances of Google Docs in Collaborative Writing

Affordance	Writing Function	Pedagogical Value
Shared document	Co-authoring a single text	Develops joint responsibility for text quality
Real-time editing	Synchronous drafting and revision	Supports immediate negotiation of meaning
Comments and suggestions	Peer and teacher feedback	Encourages revision-oriented interaction

Revision history	Tracking contribution and draft development	Improves accountability and process assessment
Cloud access	Work beyond classroom time and place	Extends writing practice and supports flexible learning

Source: Synthesized from reviewed literature.

Support for Writing as a Process

Google Docs-mediated collaborative writing supports writing as a process rather than a one-time product. Students can use the platform for brainstorming, outlining, drafting, peer reviewing, revising, and final editing. The digital environment allows every stage to be documented. This is important because writing development depends not only on the final score but also on students' ability to plan ideas, revise organization, improve sentence accuracy, and reflect on textual choices.

Research on collaborative writing shows that joint composing can improve text quality because students pool linguistic and rhetorical resources. Storch (2005) reported that collaborative writing encouraged students to discuss language and text choices. Fernandez Dobao (2012) also found that group and pair writing can generate more accurate texts than individual writing in certain conditions. In digital contexts, these processes can be strengthened because the text is continuously visible and editable by all group members.

The process approach becomes more concrete when teachers design stages. For example, students may first discuss the topic in a planning table, then write a shared outline, then draft paragraph by paragraph, then use comments for peer response, and finally revise based on agreed criteria. When the stages are explicit, Google Docs helps students see that writing is iterative. Without staged guidance, students may treat Google Docs only as a place to type answers.

Peer Interaction and Language Learning

Collaborative writing through Google Docs can promote peer interaction that supports language learning. During shared composing, students need to make decisions about vocabulary, grammar, sentence structure, content relevance, transitions, and paragraph order. These decisions often lead to language-related episodes, in which learners discuss how language should be used. Such episodes are valuable because students notice gaps in their knowledge and learn from peer explanation.

The quality of peer interaction is crucial. Li and Kim (2016) showed that collaborative writing interaction can vary across groups. Some groups demonstrate mutual engagement, shared decision-making, and balanced contribution, while others show unequal participation or

fragmented work. Li and Zhu (2017) further indicate that the quality of group interaction is linked to the quality of collaborative writing products. Therefore, the success of Google Docs-mediated writing depends on how students interact around the text, not simply on whether they share a document.

Teacher scaffolding is necessary to make interaction productive. Students need to know what to discuss, how to give feedback, how to disagree politely, and how to justify revision. In EFL classrooms, teachers may provide sentence starters such as 'I think this sentence needs more detail because...', 'Can we add evidence here?', or 'This transition is unclear because...'. Such scaffolds help students move beyond correction toward rhetorical discussion.

Feedback, Revision, and Writing Improvement

Google Docs provides a practical environment for feedback-rich writing instruction. Teachers can respond to student drafts through comments, suggestions, rubric notes, and conferencing. Peers can also comment on content, organization, vocabulary, and mechanics. The most important feature is that feedback can be attached directly to specific parts of the text. This makes feedback more contextualized and easier to act upon than general oral comments.

Feedback becomes meaningful when it leads to revision. Neumann and Kopcha (2019) show that Google Docs can support peer-then-teacher review because students can discuss and respond to comments within the writing space. The platform also allows teachers to see whether students accept suggestions, ignore comments, or revise independently. This creates opportunities for teachers to teach feedback literacy: students learn how to interpret comments, prioritize revisions, and justify changes.

However, feedback through Google Docs can also become superficial. Students may write comments such as 'good job' or 'check grammar' without giving actionable guidance. Teachers may also over-comment on minor errors, leading students to focus narrowly on surface editing. Effective feedback should therefore be guided by writing criteria. For example, students may be asked to comment on thesis clarity, supporting details, coherence, vocabulary appropriateness, and grammar patterns in separate revision rounds.

Table 2 Recommended Google Docs Collaborative Writing Cycle

Stage	Student Activity	Teacher Support
Pre-writing	Discuss topic, generate ideas, and create outline	Provide prompt, model text, and writing criteria
Drafting	Compose shared text with assigned	Monitor contribution and clarify task

	roles	expectations
Peer feedback	Use comments to question, suggest, and evaluate	Provide feedback stems and checklist
Revision	Revise content, organization, and language	Respond to unresolved problems and guide priorities
Reflection	Explain changes and evaluate collaboration	Assess process, product, and participation

Source: Synthesized from reviewed literature.

Learner Engagement and Accountability

The reviewed studies suggest that Google Docs can increase learner engagement because students are able to see an evolving shared product. The visibility of peer contributions may encourage students to participate, compare ideas, and respond to group progress. Liu, Liu, and Liu (2018) note that group awareness can increase engagement in online collaborative writing. In Google Docs, awareness is supported by real-time editing, comment notifications, and revision history.

Accountability is another important benefit. In conventional group writing, teachers may find it difficult to identify individual contributions. Google Docs makes participation more traceable. Teachers can examine revision history, comment patterns, and contribution types. However, accountability should not be reduced to word count. A student who writes fewer words may still contribute substantially through outlining, revising, correcting, or giving feedback. Therefore, assessment should include both product quality and process contribution.

Learner engagement is also influenced by affective factors. Some students may enjoy the interactive nature of Google Docs because it reduces isolation and provides peer support. Others may feel anxious because their writing is visible to classmates. Teachers need to build a supportive classroom culture where drafts are treated as developing texts, not as final judgments of ability.

Implementation Challenges

The first challenge is unequal participation. Some students may dominate the document, while others contribute minimally. This problem can be addressed through assigned roles such as idea developer, drafter, language checker, coherence reviewer, and editor. Roles should rotate so that all students experience different aspects of writing.

The second challenge is task fragmentation. Students may divide a text into parts and write independently without discussing the whole composition. This weakens collaborative writing because the final product may lack coherence. Teachers should require groups to

produce a shared outline, discuss paragraph connections, and revise the full text collectively.

The third challenge is limited feedback quality. Students may not know how to provide useful peer comments. Feedback training is therefore essential. The fourth challenge is digital access. Some students may have unstable internet connections or limited devices. Teachers need to prepare alternatives, such as offline drafting followed by online revision, pair-based device sharing, or scheduled computer laboratory use. The fifth challenge is assessment ambiguity. Teachers need rubrics that evaluate content, organization, language, collaboration, feedback quality, and revision evidence.

Table 3 Common Challenges and Pedagogical Responses

Challenge	Risk	Pedagogical Response
Unequal participation	Dominant and passive group roles	Assign rotating roles and use revision history
Fragmented writing	Weak coherence across paragraphs	Require shared outline and whole-text revision
Superficial feedback	Comments do not guide revision	Use feedback checklist and model comments
Digital access limits	Uneven opportunity to participate	Provide flexible access and offline-online alternatives
Assessment ambiguity	Students focus only on final product	Assess product, process, feedback, and reflection

Source: Synthesized from reviewed literature.

2. Discussion

The synthesis shows that collaborative writing through Google Docs is pedagogically valuable when it transforms writing from individual production into shared meaning-making. In EFL classrooms, students often experience writing as a solitary and accuracy-focused task. Google Docs can change this experience by making writing more interactive, visible, and revisable. However, the tool itself is not the source of learning. Learning occurs through the interaction, feedback, negotiation, and revision that the tool enables.

The second contribution concerns collaborative dialogue. Collaborative writing requires students to talk about language. They must decide whether an idea is relevant, whether a sentence is grammatical, whether a word is appropriate, and whether a paragraph is coherent. These discussions create opportunities for noticing and learning. Storch (2011, 2019) argues that collaborative writing can become a site for L2 development because learners jointly solve linguistic and rhetorical problems. Google Docs can extend this process

by allowing students to continue interaction through comments and suggestions outside class time.

The third contribution is revision. Many students revise only at the surface level because they lack models of meaningful revision. Google Docs can make revision more explicit because changes can be traced through revision history. Teachers can ask students to explain why they changed a thesis statement, reorganized paragraphs, added evidence, or corrected tense usage. This turns revision into a learning activity rather than a mechanical correction stage.

The fourth contribution is feedback integration. In paper-based instruction, feedback is often delayed and separated from the composing process. In Google Docs, feedback can occur while the text is being developed. This creates a more formative feedback environment. Students can receive comments, ask clarification questions, revise immediately, and compare versions. Nevertheless, feedback must be guided by criteria. Without criteria, both peer and teacher feedback may become fragmented or overly focused on grammar.

The fifth contribution is accountability. Revision history and comments help teachers observe the writing process. This is significant because group writing assessment often faces the problem of invisible contribution. However, teachers should interpret digital traces carefully. A student who contributes fewer words may have provided important conceptual or editorial support. Therefore, assessment should combine revision history, peer evaluation, teacher observation, group product, and individual reflection.

The synthesis also indicates that Google Docs-mediated collaborative writing requires structured instructional design. A common mistake is to assume that students will collaborate effectively once they are placed in a shared document. In reality, collaboration must be taught. Students need roles, timelines, feedback criteria, revision routines, and norms for respectful interaction. Teachers should model how to write comments, how to negotiate wording, and how to make group decisions.

The role of the teacher changes in Google Docs-mediated writing. The teacher is not only a corrector of final texts but also a designer of collaboration, facilitator of interaction, monitor of participation, provider of feedback, and evaluator of process. Teachers can observe documents during drafting and intervene when groups are stuck, when misconceptions appear, or when one student dominates. This active facilitation distinguishes meaningful collaborative writing from unstructured group work.

There are also ethical and practical considerations. Students should know how their contributions will be assessed and how revision history will be used. Teachers should avoid using digital traces only to punish low participation. Instead, revision history should support formative guidance and accountability. Data privacy should also be considered when using cloud-based platforms. Teachers need to ensure that document sharing settings are appropriate and that students do not expose personal information unnecessarily.

In Indonesian and other EFL school contexts, Google Docs offers practical possibilities because it is widely accessible and relatively simple to use. Yet its implementation should consider classroom realities such as device availability, internet connection, teacher workload, and students' digital literacy. A blended model may be more realistic than a fully online model. Students can discuss face-to-face, draft in Google Docs, receive peer comments online, and revise both inside and outside class.

Comparison with Previous Studies

The digital strand of this literature is equally consistent. Kessler (2009) and Kessler and Bikowski (2010) found that learners working in wikis attended to form on their own initiative and developed autonomous language-learning behaviours, and Kuteeva (2011) showed that wiki writing changed the relationship between writer and reader. For Google Docs specifically, Firth and Mesureur (2010) documented early classroom applications, Woodrich and Fan (2017) found that the platform allowed reluctant students to contribute more than they did face to face, and Cho (2017) identified the factors that mediate synchronous web-based collaboration. Kost (2011) and Zhang (2018) examined revision behaviour and showed that visible revision histories change how learners approach editing, while Elola and Oskoz (2010) report that collaborative digital writing develops academic language and learner autonomy together. Hafner and Miller (2011) make the same case for digitally mediated project work. The recent reviews by Li and Zhang (2023) and Li (2023) confirm a positive overall effect for online collaborative writing while noting wide variation in task design, and Cho and Schunn (2007) and Deane et al. (2008) supply the peer-review and assessment frameworks against which such work should be judged.

Theoretical and Pedagogical Implications

Theoretically, the synthesis indicates that the platform contributes by making the writing process visible rather than by enabling

collaboration as such. Learners already collaborated on paper; what the shared document adds is a record of who wrote what, when, and what was changed, which turns revision into an object that can be discussed. This explains the recurring finding that gains cluster in accuracy and in language-related episodes rather than in fluency: the visible trace prompts attention to form. It also explains why studies that used the platform merely as a shared container reported no advantage over individual writing.

Pedagogically, three implications follow. First, the task must require joint decisions rather than divisible parts; where students split a text into sections and worked alone, the collaboration disappeared even though the document was shared. Second, comment and suggestion features should be taught explicitly, because the reviewed studies show that learners left to themselves overwhelmingly edit directly and lose the negotiation that produces learning. Third, teachers should use the revision history formatively rather than for surveillance; its pedagogical value lies in showing students how their text developed, not in checking who contributed least.

Limitations and Directions for Future Research

This review has several limitations. First, it is a narrative synthesis rather than a meta-analysis and therefore describes patterns without quantifying them. Second, the reviewed studies vary widely in group size, task type, and duration, and several report only learner perception. Third, most were conducted with university students, so the findings should be applied to school settings with caution. Fourth, connectivity and device access are preconditions that the reviewed studies rarely report, although they determine whether the approach is feasible at all. Future research could compare task designs experimentally, analyse revision histories as process data, extend the evidence base to secondary classrooms, and report the infrastructure conditions under which the studies were conducted.

D. Conclusion

This article examined collaborative writing through Google Docs in English language learning through a structured narrative review and pedagogical synthesis. The synthesis shows that Google Docs can support EFL writing instruction by enabling shared composing, real-time and asynchronous collaboration, peer feedback, teacher comments, revision tracking, and flexible access. Its major pedagogical contributions include supporting writing as a process, strengthening peer interaction, improving revision practice, increasing engagement and accountability, and expanding feedback opportunities. However,

these benefits depend on careful instructional design. Google Docs-mediated collaborative writing may be weakened by unequal participation, fragmented task division, superficial feedback, limited digital access, and unclear assessment. The article concludes that Google Docs should not be treated merely as a digital writing tool but as a collaborative learning environment that requires explicit roles, staged writing cycles, clear criteria, feedback training, teacher facilitation, and reflective revision. Future research should examine classroom-based interventions in Indonesian EFL contexts, compare different grouping strategies, analyze revision history as learning evidence, and investigate how Google Docs-supported collaborative writing affects individual writing development over time.

Declaration of AI-Assisted Technologies

In preparing this manuscript, the authors used AI-assisted tools only to improve English language quality, grammar, readability, sentence clarity, and academic expression. The AI tools were not used to generate research data, conduct data analysis, produce findings, or draw conclusions. All conceptual arguments, data interpretation, methodological decisions, and scholarly conclusions remain the full responsibility of the authors. The authors carefully reviewed, edited, and verified all AI-assisted outputs to ensure the accuracy, integrity, and originality of the final manuscript.

Conflict of Interest

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

Bibliography

- Cho, H. (2017). Synchronous web-based collaborative writing: Factors mediating interaction among second-language writers. *Journal of Second Language Writing*, 36, 37-51. doi: 10.1016/j.jslw.2017.05.013
- Cho, K., & Schunn, C. D. (2007). Scaffolded writing and rewriting in the discipline: A web-based reciprocal peer review system. *Computers & Education*, 48(3), 409-426. doi: 10.1016/j.compedu.2005.02.004
- Deane, P., Odendahl, N., Quinlan, T., Fowles, M., Welsh, C., & Bivens-Tatum, J. (2008). Cognitive models of writing: Writing proficiency as a complex integrated skill. ETS Research Report Series, 2008(2), i-36. doi: 10.1002/j.2333-8504.2008.tb02141.x
- Elola, I., & Oskoz, A. (2010). Collaborative writing: Fostering foreign language and writing conventions development. *Language Learning & Technology*, 14(3), 51-71. doi: 10.64152/10125/44226
- Fernandez Dobao, A. (2012). Collaborative writing tasks in the L2 classroom: Comparing group, pair, and individual work. *Journal of Second Language Writing*, 21(1), 40-58. doi: 10.1016/j.jslw.2011.12.002

- Firth, M., & Mesureur, G. (2010). Innovative uses for Google Docs in a university language program. *The JALT CALL Journal*, 6(1), 3-16. doi: 10.29140/jaltcall.v6n1.88
- Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32(4), 365-387. doi: 10.2307/356600
- Hafner, C. A., & Miller, L. (2011). Fostering learner autonomy in English for science: A collaborative digital video project in a technological learning environment. *Language Learning & Technology*, 15(3), 68-86. doi: 10.64152/10125/44263
- Hyland, K. (2003). *Second language writing*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511667251
- Kessler, G. (2009). Student-initiated attention to form in wiki-based collaborative writing. *Language Learning & Technology*, 13(1), 79-95. doi: 10.64152/10125/44169
- Kessler, G., & Bikowski, D. (2010). Developing collaborative autonomous learning abilities in computer mediated language learning: Attention to meaning among students in wiki space. *Computer Assisted Language Learning*, 23(1), 41-58. doi: 10.1080/09588220903467335
- Kessler, G., Bikowski, D., & Boggs, J. (2012). Collaborative writing among second language learners in academic web-based projects. *Language Learning & Technology*, 16(1), 91-109. doi: 10.64152/10125/44276
- Kitjaroonchai, N., & Suppasetserree, S. (2021). Online collaborative writing via Google Docs: Case studies in the EFL classroom. *Journal of Language Teaching and Research*, 12(6), 922-934. doi: 10.17507/jltr.1206.08
- Kost, C. (2011). Investigating writing strategies and revision behavior in collaborative wiki projects. *CALICO Journal*, 28(3), 606-620. doi: 10.11139/cj.28.3.606-620
- Kuteeva, M. (2011). Wikis and academic writing: Changing the writer-reader relationship. *English for Specific Purposes*, 30(1), 44-57. doi: 10.1016/j.esp.2010.04.007
- Li, M. (2013). Individual novices and collective experts: Collective scaffolding in wiki-based small group writing. *System*, 41(3), 752-769. doi: 10.1016/j.system.2013.07.021
- Li, M. (2018). Computer-mediated collaborative writing in L2 contexts: An analysis of empirical research. *Computer Assisted Language Learning*, 31(8), 882-904. doi: 10.1080/09588221.2018.1465981
- Li, M., & Kim, D. (2016). One wiki, two groups: Dynamic interactions across ESL collaborative writing tasks. *Journal of Second Language Writing*, 31, 25-42. doi: 10.1016/j.jslw.2016.01.002
- Li, M., & Storch, N. (2017). Second language writing in the age of CMC: Affordances, multimodality, and collaboration. *Journal of Second Language Writing*, 36, 1-5. doi: 10.1016/j.jslw.2017.05.012
- Li, M., & Zhang, M. (2023). Collaborative writing in L2 classrooms: A research agenda. *Language Teaching*, 56(1), 94-112. doi: 10.1017/S0261444821000318
- Li, M., & Zhu, W. (2017). Good or bad collaborative wiki writing: Exploring links between group interactions and writing products. *Journal of Second Language Writing*, 35, 38-53. doi: 10.1016/j.jslw.2017.01.003

- Li, Y. (2023). The effect of online collaborative writing instruction on enhancing writing performance, writing motivation, and writing self-efficacy of Chinese EFL learners. *Frontiers in Psychology*, 14, 1165221. doi: 10.3389/fpsyg.2023.1165221
- Liu, M., Liu, L., & Liu, L. (2018). Group awareness increases student engagement in online collaborative writing. *The Internet and Higher Education*, 38, 1-8. doi: 10.1016/j.iheduc.2018.04.001
- McDonough, K., De Vleeschauwer, J., & Crawford, W. (2018). Comparing the quality of collaborative writing, collaborative prewriting, and individual texts in a Thai EFL context. *System*, 74, 109-120. doi: 10.1016/j.system.2018.02.010
- Neumann, K. L., & Kopcha, T. J. (2019). Using Google Docs for peer-then-teacher review on middle school students' writing. *Computers and Composition*, 54, 102524. doi: 10.1016/j.compcom.2019.102524
- Shehadeh, A. (2011). Effects and student perceptions of collaborative writing in L2. *Journal of Second Language Writing*, 20(4), 286-305. doi: 10.1016/j.jslw.2011.05.010
- Storch, N. (2005). Collaborative writing: Product, process, and students' reflections. *Journal of Second Language Writing*, 14(3), 153-173. doi: 10.1016/j.jslw.2005.05.002
- Storch, N. (2011). Collaborative writing in L2 contexts: Processes, outcomes, and future directions. *Annual Review of Applied Linguistics*, 31, 275-288. doi: 10.1017/S0267190511000079
- Storch, N. (2013). Collaborative writing in L2 classrooms. Bristol: Multilingual Matters. doi: 10.21832/9781847699954
- Storch, N. (2019). Collaborative writing. *Language Teaching*, 52(1), 40-59. doi: 10.1017/S0261444818000320
- Valizadeh, M. (2022). Collaborative writing on Google Docs: Effects on EFL learners' descriptive paragraphs. *Indonesian Journal of English Language Teaching and Applied Linguistics*, 6(2), 277-287. doi: 10.21093/ijeltal.v6i2.1053
- Wigglesworth, G., & Storch, N. (2009). Pair versus individual writing: Effects on fluency, complexity and accuracy. *Language Testing*, 26(3), 445-466. doi: 10.1177/0265532209104670
- Woodrich, M., & Fan, Y. (2017). Google Docs as a tool for collaborative writing in the middle school classroom. *Journal of Information Technology Education: Research*, 16, 391-410. doi: 10.28945/3870
- Zhang, M. (2018). Collaborative writing in the EFL classroom: The effects of L1 and L2 use. *System*, 76, 1-12. doi: 10.1016/j.system.2018.04.009