Pretask training for web-based second language collaborative writing

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Abstract

This study examined the effects of pretask training to promote peer collaboration, encourage learning opportunities, and foster individual L2 writing development in web-based L2 collaborative writing (CW) tasks. The participants were 48 students from two junior English composition classes at a Taiwanese university. One class ($n = 24$) was assigned to be a pretask training (PT) group and the other ($n = 24$) to a no pretask training (NPT) group. Both groups completed an individual pre- and post-test writing, and two L2 CW tasks via Google Docs. The PT group received pretask training before the CW tasks, whereas the NPT group did not. The interaction between the learners was analyzed for the number, outcome, and engagement level of content-, organization-, and language-related episodes (LREs) and for the learners’ interaction patterns. Pre- and post-test writing was analyzed in terms of content and organization and language complexity and accuracy. The PT group (a) produced more collaborative interaction during the CW processes than the NPT group, (b) produced more LREs and correctly resolved a greater proportion of LREs and content-related episodes, and (c) made greater improvement in content and language accuracy of individual L2 writing.

Keywords: Pretask Training, Peer Collaboration, Learning Opportunities, Web-Based Collaborative Writing

Language(s) Learned in This Study: English


Introduction

The use of pair and group work is widespread in second language (L2) pedagogy, as there is consensus among L2 researchers and teachers that interaction creates opportunities for L2 learning (Sato & Ballinger, 2016). Learning opportunities include corrective feedback (CF) (Sato & Lyster, 2012), language-related episodes (LREs) (Kim, 2008), and languaging (Swain, 2006). In L2 writing classes, pair and small group activities frequently occur in collaborative writing (CW), which Storch (2013) defined as a task where two or more writers interact throughout the writing process to co-construct a single text. Unlike collaborative activities, such as peer editing and cooperating (i.e., combining individually written text sections into a single paper), CW involves a sustained pattern of interaction among writers and shared responsibilities for the co-construction of texts. CW tasks have found support from both interactionist and sociocultural perspectives of L2 development (McDonough et al., 2016). From an interactionist perspective, CW elicits communication between learners, creating opportunities for meaning negotiation, feedback, and modified output, facilitating L2 development (Mackey, 2012). From a sociocultural standpoint, CW provides the social context foundation for languaging, a process of using language for meaning-making and knowledge-shaping (Swain, 2006). In this way, L2 writing instruction highlights the importance of CW in developing
students’ writing skills (Storch, 2013).

However, research has demonstrated that not all learners work in a collaborative manner when assigned to work on writing tasks in pairs or small groups (Storch, 2002a). Drawing on the indexes of equality (the level of group members’ contributions and their control over the writing direction) and mutuality (the degree of group members’ engagement with each other’s contributions), studies on peer interaction during face-to-face (e.g., Storch, 2002a) and web-based L2 CW tasks (e.g., Li & Zhu, 2013, 2017b) have revealed that learners form distinct types of relationships and engage in different interaction patterns, including collaborative, expert/novice, dominant/dominant, cooperative, and dominant/passive. Setting aside the writing environment differences, the overall findings of these studies have indicated that pairs with high mutuality interaction patterns (i.e., demonstrating collaborative pair dynamics) produced better writing quality and generated more learning opportunities.

With the increasing accessibility of Web 2.0 technologies (e.g., Google Docs) and their ease of use for composing, commenting on, and editing, web-based CW has begun to gain popularity in L2 writing pedagogy and research (Aydin & Yildiz, 2014; Kessler et al., 2012; Li, 2018). Nevertheless, studies have found that L2 learners are more likely to cooperate (i.e., divide labor between them and assemble individual work into a final larger whole, forming a pattern that demonstrates low mutuality) than collaborate (i.e., building upon each other’s contributions and co-constructing a text together, forming a pattern that demonstrates high mutuality) in a web-based context (Roushdad & Storch, 2016; Tan et al., 2010). Considering the inevitable inclusion of web-based activities in second/foreign language classes in this technologically driven world (Ortega, 2009; Thorne & Reinhardt, 2008) and the growing attention on web-based CW in L2 learning (Li, 2018), there is a need to identify effective strategies for engaging L2 learners in collaborative pair dynamics so that learning opportunities can be augmented and L2 writing development enhanced in web-based CW tasks.

Some peer interaction studies have suggested that L2 learners can be trained to become better interactors and feedback providers (e.g., Kim & McDonough, 2011; Sato & Ballinger, 2012; Sato & Loewen, 2018); however, these studies have been primarily conducted in face-to-face oral contexts. Fewer studies have explored whether pretask training is an effective pedagogical technique for promoting collaborative pair dynamics and more learning opportunities, and facilitating L2 writing development in web-based L2 CW. This study aims to bridge this research gap.

**Factors Affecting Peer Interaction in Web-Based CW Contexts**

Given the mixed findings on interaction patterns in web-based L2 CW, researchers have started to explore factors that may mediate peer interaction and account for pair dynamics. Arnold et al. (2012), for instance, engaged three intermediate German classes in wiki CW projects and reported divergent patterns among the classes: collaborative in one and cooperative in the other two classes. After analyzing students’ answers to a questionnaire, Arnold et al. concluded that students’ perceptions of group work could account for the divergent patterns revealed between the classes: students in the collaborative class overall were more positive toward the wiki project and considered their group work as beneficial. Thus, Arnold et al. highlighted the importance of making group members view their specific contributions as a necessary component of the final joint product. Li and Zhu (2017a) found that peer interaction patterns across wiki-based CW tasks among L2 college students could be affected by sociocultural factors, such as agency and emotions. Cho (2017) found that for L2 writers in web-based CW settings, perceptions of peer feedback could affect peer interaction.

To overcome these social obstacles to promote effective online peer interaction in web-based L2 CW, Arnold et al. (2012), Cho (2017), and Li (2018) proposed that students could be (a) trained for ways to conduct CW (e.g., offer feedback effectively), (b) oriented toward group-work benefits, and (c) convinced of their own important role in the completion of the CW task.
Pretask Training, Peer Interaction, and L2 Learning

The theoretical underpinning of pretask training rests upon the assumptions that (a) explicit instruction designed to teach learners how to collaborate and give feedback could help learners become aware of the effectiveness and value of peer interaction and peer feedback (Sato, 2013), and (b) pretask activities could help draw learners’ attention to the interactional features useful for task accomplishment (Willis & Willis, 2007) and provide guidance to help learners identify ways of interacting that generate learning opportunities (Sato & Lyster, 2012). Research on learner–learner interaction has examined the effectiveness of pretask training in eliciting collaborative pair dynamics, generating more learning opportunities, and fostering L2 development. Kim and McDonough (2011) created and showed their students short video clips of two interlocutors modeling how to correctly solve language problems in oral communicative tasks and demonstrating collaborative pair dynamics (i.e., both interlocutors provided feedback, responded to questions, and shared ideas). Defining learning opportunities as LREs (Swain & Lapkin, 1998) and conceptualizing pair dynamics based on Storch’s (2002a, 2002b) framework, Kim and McDonough (2011) found that students who received pretask training produced and correctly solved more LREs, and demonstrated more collaborative pair dynamics than learners without receiving such training. In addition, Kim (2013) reported that pretask training helped learners produce more LREs involving the target linguistic structure (i.e., English questions), thereby developing the target structure.

Sato and Ballinger (2012) found that only students trained to realize the value of and provide CF to each other during oral communicative peer interaction activities (using modeling, practice, and use-in-context) could significantly increase CF frequency, as they ameliorated their language awareness by paying more attention to form and automatically working on linguistic problems during the interaction, raising L2 development measured by speaking accuracy. Using the same instructional intervention in a follow-up study, Sato (2013) found that the training positively impacted learners’ willingness and confidence to provide each other with CF.

These studies confirm the effectiveness of pretask training in (a) eliciting collaborative pair dynamics, (b) generating more learning opportunities, and (c) facilitating subsequent L2 development. However, they are restricted to face-to-face oral contexts. In a web-based context, Liou and Peng (2009) examined the training effects of peer reviews on L2 learners’ peer comments and their revision quality when composing weblogs. They found that trained students, with explicit instructions on providing feedback on peers’ essays for revision, made more revision-oriented comments and were more successful in revising their compositions. Though Liou and Peng’s study provided evidence supporting the effectiveness of pretask training in a web-based context, their study was confined to individual writing activities. Web-based L2 CW remains under-researched.

Li (2018) indicated that well-structured student training is essential in web-based L2 CW. She suggested that “teachers need to explain what characterizes collaborative writing and highlight concepts such as co-ownership, collective cognition, and individual accountability” (p. 899). With that understanding in mind, students could then collaboratively produce a writing text online. Instead of combining texts written by individual members (cooperation), students exert collective efforts among individual members to achieve coherence in a shared, co-owned text (collaboration) (Li & Zhu, 2017b). While the importance of training in web-based L2 CW is highlighted in current literature, the effectiveness of pretask training remains under-investigated, particularly regarding its effectiveness in promoting peer collaboration, encouraging learning opportunities, and improving individual L2 writing.

Research Questions

This study addresses the following three research questions (RQs):

1. Does pretask training promote more collaborative pair dynamics during web-based L2 CW?
2. Does pretask training encourage more learning opportunities during web-based L2 CW?
3. Does pretask training impact learners’ individual L2 writing development in content quality and organization, and linguistic complexity and accuracy?

Methodology

Participants
Participants were 48 English-as-a-foreign-language (EFL) learners aged 20–21 years from two intact junior English writing classes in an applied linguistic department at a Taiwanese university. One class is the pretask training (PT) group (n = 24; 18 female, 6 male), and the other is the no pretask training (NPT) group (n = 24; 17 female, 7 male). Both classes followed a unified syllabus, used the same textbooks, were given the same number of writing assignments, followed unified grading criteria, and met on the same weekday for 2 hours each during the experiment period. Prior to the study, all students had taken four semesters of required writing instruction (grammar, paragraph writing, and essay writing) at the university-level. Students’ English proficiency was, in general, at the B2 level according to the Common European Framework of Reference for Languages (CEFR).2

Materials

Writing Tasks
Two individual writing tasks (Appendix A), designed in parallel form, were administered during the learners’ scheduled writing class as a pretest and a posttest to measure the effect of pretask training on students’ L2 writing development. Both tests were pilot-tested3. Specifically, they required students to write an expository essay individually within 90 minutes. Two collaborative writing tasks (Appendix B), also designed in parallel form, were used as treatment tasks and were completed by the participants working in self-selected pairs via Google Docs out of class. Lee (2010) cautioned that individual contributions and joint efforts are less likely to occur without proper guidance. In this study, guidelines (Appendix C) thus were provided, which informed the students only of what needed to be done for the collaborative work, not how to perform it. The order of task implementation was counterbalanced.

Pretask Training Materials
In line with previous research (e.g., Fujii et al., 2016; Kim & McDonough, 2011; Sato & Ballinger, 2012), pretask training in this study was provided in three stages, lasting around 35 minutes in the scheduled writing class.

Stage 1: Explanation
Pretask training started with a PowerPoint presentation on the importance and benefits of collaboration in L2 learning and the roles of collaboration in developing L2 writing proficiency. The researcher explained how peer collaboration could facilitate the development of learners’ language quality and the quality of the content and organization of their written production. The researcher also explained how peers could act as valuable learning resources in collaborative written work and the importance of individual contributions (e.g., peer review, peer feedback, self, and other repairs). The primary aim of this stage was to cultivate learners’ awareness that peer interaction and peer feedback are important to foster their L2 writing skills.

Stage 2: Modeling
In this stage, the researcher demonstrated web-based collaborative writing processes using PowerPoint slides (Appendix D). The slide model not only provided examples of correctly resolved LREs and successfully resolved content- and organization-related episodes, but also demonstrated collaborative pair dynamics with two writers providing reciprocal feedback, responding to questions, and sharing ideas. This stage aimed to draw learners’ attention to the way of interacting and provide guidance on collaborative behaviors beneficial for L2 writing development.

Stage 3: Practice
The final stage of pretask training provided learners with a practice activity involving giving and responding to feedback on content, organization, and language, in which learners gain hands-on experience before engaging in subsequent collaborative writing tasks.

**Exit Questionnaire**

The exit questionnaire (Appendix E), modeled after Fujii et al. (2016), consists of 10 items constructed to elicit learners’ perceptions and evaluate the pretask training. Learners responses were rated using a 6-point Likert scale ranging from a score of 1 for *completely disagree* to 6 for *completely agree*.

**Figure 1**

*Procedures of the Study*

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Individual pretest writing</th>
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</thead>
<tbody>
<tr>
<td>Week 2</td>
<td>PT Group</td>
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<td>Introduction to Google Docs</td>
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<tr>
<td>Week 3</td>
<td>NPT Group</td>
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<td>Introduction to Google Docs</td>
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<td>Week 4</td>
<td>Collaborative writing task 1</td>
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<td>Week 5</td>
<td>PT Group</td>
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<td></td>
<td>Introduction to collaborative writing task 1</td>
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<td>Week 6</td>
<td>NPT Group</td>
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<td>Introduction to collaborative writing task 2</td>
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<td>Week 7</td>
<td>Collaborative writing task 2</td>
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<tr>
<td>Week 8</td>
<td>PT Group</td>
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<td></td>
<td>Exit questionnaire</td>
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</tbody>
</table>

**Procedure**

**PT Group**

Learners \( n = 24 \) in the PT group undertook pretest writing at the outset of the study. In the following week, the researcher, also the instructor, introduced the learners to the key features of Google Docs,
including composing, commenting, replying, and editing; following that, the researcher designed a Google Docs trail page to provide further practice. The learners were then introduced to CW task 1, followed by the three-stage pretask training described above. Afterward, the learners worked in 12 self-selected pairs to complete CW task 1 via Google Docs out of class within one week and submitted their jointly produced essays for a grade (10% of the final grade). In a similar vein, the CW task 2 was released with the three-stage pretask training, a one-week deadline for composing, and the same final-grade contribution (10%). Posttest writing was implemented one week after completing CW task 2. At the end of the study, the exit questionnaire was administered in class.

**NPT Group**

The NPT group ($n = 24$; 12 pairs) followed the same procedure, but the learners in this group did not receive pretask training and thus were not required to complete the exit questionnaire. Figure 1 summarizes the study procedure.

**Data Coding and Measuring**

Data from CW task 2 constituted the data sources for coding and measuring.

**Pair Dynamics**

This study explores whether pretask training promotes collaborative pair dynamics with high mutuality characteristics in web-based CW tasks. To evaluate degrees of mutuality in peer interaction, this study adopted Li and Kim’s (2016) and Li and Zhu’s (2013, 2017a, 2017b) frameworks. Mutuality was assessed by: (a) scrutinizing Google Docs comments for instances of language functions (i.e., language mediating functions, such as acknowledging, agreeing, eliciting, elaborating, stating, and suggesting) and categorizing them as initiating (i.e., proposing ideas) or responding (i.e., reacting to partner’s ideas); (b) scrutinizing Google Docs comments and history archives for instances of writing change functions (i.e., text co-construction functions, such as adding, deleting, rephrasing, and correcting) and categorizing them as self or other (i.e., changes to one’s own/partner’s text); and (c) scrutinizing Google Docs comments for instances of scaffolding strategies (i.e., peer assistance that facilitated the completion of the joint essay, such as instructing [IT], encouraging [E], and writing direction maintenance [DM]). Among them, frequent instances of responding language functions, other writing change functions, and scaffolding strategies indicate high mutuality. Pairs displaying such pair dynamics were coded “collaborative,” and others were coded “non-collaborative.” Following the outlined coding framework, the researcher and an outside researcher coded 25% of the data. The percentage agreement for interrater reliability was 83% for pair dynamics. Disagreements were resolved through discussion. Table 1 and Table 2 display the number of language and writing change functions, the use of scaffolding strategies, and the pair dynamics in the PT and NPT groups. The following examples illustrate collaborative (Example 1) and non-collaborative (Examples 2 and 3) pair dynamics.

In Example 1, S2 noticed a mistake in the use of the verb “interfere,” highlighted the phrase “interfere the election,” and suggested that they add the preposition “with.” S1 acknowledged the help and suggested that “interfere” could also go with another preposition, “in,” to which S2 agreed. S2 then elaborated on the information, providing instruction on how the verb “interfere” could be used (a scaffolding strategy) and suggesting that they change the phrase to “interfere in the election.” S1 agreed and thanked S2 for her effort. Both learners therefore contributed in a joint manner to constructing the text. Their interaction contained segments in which both learners provided feedback on the other’s ideas. They elicited and suggested ideas and responded via the comment function, working and frequently engaging with each other’s ideas to resolve the issue. In sum, S1 contributed 36 language functions (20 were responding), and S2 contributed 25 language functions (14 responding); regarding writing change functions, S1 generated 31 (5 were other), and S2 generated 10 (4 other). These pair dynamics were coded as “collaborative.”
Table 1

*The Number of Language and Writing Change Functions, Use of Scaffolding Strategies, and Pair Dynamics in PT Group*

<table>
<thead>
<tr>
<th>Pair</th>
<th>Members</th>
<th>Language Functions</th>
<th>Writing Change Functions</th>
<th>Scaffolding Strategies</th>
<th>Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Responding</td>
<td>Total</td>
<td>Other</td>
<td>Total</td>
</tr>
<tr>
<td>1</td>
<td>S1</td>
<td>20</td>
<td>36</td>
<td>5</td>
<td>31</td>
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<td></td>
<td>S2</td>
<td>14</td>
<td>25</td>
<td>4</td>
<td>10</td>
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<tr>
<td>2</td>
<td>S3</td>
<td>20</td>
<td>44</td>
<td>25</td>
<td>27</td>
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<td>S4</td>
<td>34</td>
<td>56</td>
<td>21</td>
<td>26</td>
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<tr>
<td>3</td>
<td>S5</td>
<td>8</td>
<td>26</td>
<td>19</td>
<td>28</td>
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<td>S6</td>
<td>7</td>
<td>15</td>
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<td>4</td>
<td>S7</td>
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<td>47</td>
<td>1</td>
<td>44</td>
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<td>S8</td>
<td>23</td>
<td>76</td>
<td>22</td>
<td>43</td>
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<td>5</td>
<td>S9</td>
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<tr>
<td>6</td>
<td>S11</td>
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<td>5</td>
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<td>S12</td>
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<td>16</td>
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<td>S16</td>
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</table>

Note. X indicates no scaffolding strategies were found.

In contrast to Example 1, Examples 2 and 3 illustrate non-collaborative pair dynamics in which learners did not collaborate to accomplish the task. In Example 2, SS7 and SS8 gave each other feedback via comments, but the feedback was neither responded to nor acknowledged, with no changes made in the text. Example 3 displayed a similar pattern. SS15 and SS16 gave each other feedback via comments, which, although acknowledged, did not lead to a revision within the text. When working on this task, SS7 contributed 31 language functions (6 were responding), and SS8 produced 29 (23 responding); SS15 contributed 17 language functions (14 responding), and SS16 produced 16 (3 responding). Concerning writing change functions, SS7 produced four writing change functions, and SS8 produced two; SS15 and SS16 each...
produced three writing change functions. It should be noted that none of these writing change functions were other. Even though these learners noticed writing issues and offered feedback, they did not heed the feedback and take action. These pair dynamics were coded “non-collaborative” along with those showing only peer editing but no interaction (i.e., other writing change functions were performed, but no language functions were produced).

Table 2

The Number of Language and Writing Change Functions, Use of Scaffolding Strategies, and Pair Dynamics in the NPT Group

<table>
<thead>
<tr>
<th>Pair</th>
<th>Members</th>
<th>Language Functions</th>
<th>Writing Change Functions</th>
<th>Scaffolding Strategies</th>
<th>Pattern</th>
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<td></td>
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<td>Other</td>
<td>Total</td>
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<tr>
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<td>2</td>
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<td>SS22</td>
<td></td>
<td>4</td>
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<td>6</td>
</tr>
<tr>
<td>12</td>
<td>SS23</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SS24</td>
<td></td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Example 1 Collaborative Pair Dynamics (Pair 1, PT group)

S2: I think it should has "with" after "interfere"
       it should be like interfere with the election (Initiating-suggesting)
S1: ah don't know about this,
       thank you~ (Responding-acknowledging)
S1: I think" interfere 'in' "is also ok (Responding-suggesting)
       what do you think? (Responding-elicitng)
S2: YES! (Responding-agreeing) I think it is okay if it is not physical objects. Because the
       information from the Internet shows that "Interfered in" cannot be used with physical objects.
       (Responding-elaborating) SOOOO maybe we can change to " interfere in" (Responding-suggesting)
S1: OK! thanks for searching. (Responding-agreeing)
Example 2 Non-collaborative Pair Dynamics (Pair 4, NPT group)

SS7: (Highlighted “a problems”) You have “a” here so no “s” in “problems” (Initiating-stating)

SS8: (Did not respond.)

SS8: (Highlighted the thesis statement). You can add something after the thesis statement to explain what this essay is about. (Initiating-suggesting)

SS7: (Did not respond.)

SS7: (Highlighted “Kids are easily to participate”) You have two verbs here. Try “easily participate”? (Initiating-suggesting)

SS8: Ok. (Responding-acknowledging)

Example 3 Non-collaborative Pair Dynamics (Pair 8, NPT group)

SS15: Thank you. (Responding-acknowledging)

SS16: (Highlighted “leads some tragedies”) leads to some tragedies. (Initiating-stating)

SS15: Ok. Thank you. (Responding-acknowledging)

SS15: (Highlighted “people under”) people are under (Initiating-stating)

SS16: (Highlighted “a lot” in the sentence “Most teenagers care a lot about how others see them”) I think the adverb seriously should be used. (Initiating-stating)

SS15: OK. (Responding-acknowledging)

Learning Opportunities

Following Hsu (2019) and Kim and McDonough (2011), learning opportunities were operationalized as content- and organization-related episodes and LREs. Content- and organization-related episodes were defined as “any part of a dialogue where the learners talk about the content messages produced, question the clarity and relevance of the messages, or discuss the sequencing of information” (Hsu, 2019, p. 8). LREs were defined as any part of a dialogue in which learners “talk about the language they are producing, question their language use, or correct themselves or others” (Swain & Lapkin, 1998, p. 326). To identify content- and organization-related episodes and LREs, the Google Docs pages created by the pairs in both groups were scrutinized, including the history, achievements, and comments.

The outcome of the content- and organization-related episodes was analyzed based on “resolved” and “unresolved.” Two types of resolved content- and organization-related episodes were further distinguished, namely, “successful” (i.e., making the content message more precise/exact or ideas more organized) and “unsuccessful.” Example 4 illustrates a successfully resolved content-related episode, whereas Example 5 illustrates an unresolved one. In Example 4, S8 first raised a clarification issue on a content message that S7 intended to express. S7 explained her intended idea, which S8 helped clarify. S7 acknowledged the help and revised the content accordingly. Since the content message became more precise, this episode was coded as a successfully resolved content-related episode. In Example 5, S18 highlighted the sentence “Media exaggeration is not terrible, be a wise reader to fight for the bad atmosphere of the media” and commented that she did not understand the content message. S17 then asked whether S18 could improve it but received no response. In other words, both learners proceeded with the task without fixing the problem. This episode was coded as an unresolved content-related episode.
Example 4 Successfully Resolved Content-related Episode (Pair 4, PT group)

S8: I think your reason is a little weird.. "People follow majority because they want to be different"??
S7: I mean that if they are different, they may not be accepted in a group
S8: So, it should be, "Youngsters follow the majority because they don't want to be different", right?
S7: YEAAAAA HAHA

Example 5 Unresolved Content-related Episode (Pair 9, PT group)

S18: What do you mean? I think the meaning is a little bit weird.
S17: Do you know how to make it better?
S18: (Did not respond.)

Likewise, this study analyzed the outcome of LREs based on resolved and unresolved categories. Two types of resolved LREs, namely, “target-like” and “non-target-like,” were further distinguished. Example 6 illustrates a resolved target-like LRE, and in Example 7, an unresolved one. In Example 6, S1 highlighted the sentence “Take Russia and U.S. for example” and asked whether the sentence was correct. S2 responded by correcting the mistake with the definite article. S1 accepted the correction and revised the text accordingly. As S2’s answer was correct, this LRE was coded as a resolved target-like LRE. In Example 7, SS16 highlighted the word “optimistic” in the sentence “Self-motivation and self-discovery are two optimistic effects by peer pressure” and commented that the word “positive” should be used instead. SS15 acknowledged the feedback but did not correct the mistake, and neither did SS16. This LRE was coded as unresolved LRE.

Example 6 Resolved Target-like LRE (Pair 1, PT group)

S1: is there something wrong?
S2: I think maybe is Russia and “the” U.S.
S1: got it~

Example 7 Unresolved LRE (Pair 8, NPT group)

SS16: I think positive should be used.
SS15: OK.

Example 8 illustrates elaborate engagement, and Example 9 illustrates limited engagement. In Example 8, S23 highlighted “no matter whether it is positive or negative” in the sentence, “Peer pressure is a necessary and essential part of an individual’s life, bringing us the development of our mind and our attitude no matter whether it is positive or negative,” and suggested that the highlighted idea be re-ordered in the sentence. S24 accepted the suggestion and revised the sentence to “Peer pressure is a necessary and essential part of
an individual’s life no matter whether it is positive or negative, bringing us the development of our mind and our attitude.” Here, one learner noted the idea organization issue in the sentence and offered a solution, and the other learner accepted and revised the sentence accordingly. This episode was coded as an elaborate organization-related episode. In Example 9, SS22 highlighted “rather than believe” in the sentence, “Thus, people should develop media literacy, so that they can filter the information rather than believe everything they receive.” At the same time, SS22 stated that “trust” was a better word than “believe,” to which SS21 did not respond; SS22 then edited the sentence individually. As SS22 was both the initiator and solver of the LRE issue, it was coded as a limited LRE.

**Example 8 Elaborate Organization-related Episode (Pair 12, PT group)**

S23: I think it can be ordered after "Peer pressure is a necessary and essential part of an individual's life,..." What do you think?

S24: Agree.

**Example 9 Limited LRE (Pair 11, NPT group)**

SS22: trust is a better word than believe here.

SS21: (Did not respond.)

**L2 Writing Development**

Development in L2 writing was operationalized as improvement in L2 individual writing from pre- to post-test and was measured in the following two dimensions: content quality and organization, and linguistic complexity and accuracy.

**Content Quality and Organization**

The content and organization in the pre- and post-test essays were rated using an eight-point analytical rating scheme (Appendix F), adopted from Hsu and Lo (2018). The researcher and the instructor of the NPT group first discussed the rating criteria and rated selected benchmark essays. Then, they compared and rated each sample piece. After agreeing on the benchmark essays, they independently assessed the remaining essays. To determine inter-rater agreement, Pearson’s $r$ was performed. A correlation coefficient $r = 0.746$ was obtained for pretest content and $r = 0.728$ for pretest organization in the PT group. A correlation coefficient $r = 0.745$ was obtained for pretest content and $r = 0.768$ for pretest organization in the NPT group. A correlation coefficient $r = 0.781$ was obtained for posttest content and $r = 0.778$ for posttest organization in the PT group. A correlation coefficient $r = 0.794$ was obtained for posttest content and $r = 0.780$ for posttest organization in the NPT group. Average scores were used for the analysis.

**Linguistic Complexity and Accuracy**

This study employed two measures of complexity and one measure of accuracy. The measures are largely the same as those used in previous L2 CW research (e.g., Fernández Dobao, 2012; Wigglesworth & Storch, 2009) and are recommended in the theoretical literature (Foster & Wigglesworth, 2016; Norris & Ortega, 2009). Specifically, the following complexity measures were used:

- **Clauses per T-unit (CTU):** CTU was calculated by dividing the total number of separate clauses by the total number of T-units. The clause boundary identification followed the guidance of Evans et al. (2014).

- **Mean length of clauses (MLC):** MLC was calculated by dividing the total number of words by the total number of clauses.

Accuracy was measured by a weighted clause ratio (WCR) (Foster & Wigglesworth, 2016). To calculate WCR, clauses were assigned to one of four levels (entirely accurate, level 1 error, level 2 error, and level 3 error) based on their error gravity (i.e., how seriously errors compromise comprehension). An entirely accurate clause received an accuracy score of 1.0, a level-1 clause of 0.8, a level-2 clause of 0.5, and a
level-3 clause of 0.1. WCR was then calculated by adding the total clause ratings for an essay and dividing the sum by the total number of clauses. The higher the WCR score, the more accurate the writing.

Percentage agreement for interrater reliability was 91%, 90%, and 88% for the classification of T-units, clauses, and error levels, respectively. Disagreements were resolved through discussion.

**Results**

**Group Comparability**

To ensure that the PT and NPT groups had comparable writing proficiency, independent t-tests were run on students’ pretest writing (see Table 3). There were no statistically significant differences between the two groups in content \(t = -0.696, p = 0.490, d = 0.19\) and organization \(t = -0.922, p = 0.361, d = 0.25\), or linguistic complexity (CTU: \(t = -1.331, p = 0.190, d = 0.38\); MLC: \(t = 1.837, p = 0.073, d = 0.53\) and accuracy (WCR: \(t = -1.955, p = 0.057, d = 0.60\)).

**Table 3**

*Differences Between Groups on Pretest Writing*

<table>
<thead>
<tr>
<th>Measures</th>
<th>PT Group (n = 24)</th>
<th>NPT Group (n = 24)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>SD</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content</td>
<td>4.40</td>
<td>0.94</td>
<td>4.56</td>
<td>0.70</td>
</tr>
<tr>
<td>Organization</td>
<td>4.42</td>
<td>0.82</td>
<td>4.60</td>
<td>0.57</td>
</tr>
<tr>
<td>CTU</td>
<td>2.09</td>
<td>0.34</td>
<td>2.23</td>
<td>0.39</td>
</tr>
<tr>
<td>MLC</td>
<td>6.77</td>
<td>0.69</td>
<td>6.46</td>
<td>0.46</td>
</tr>
<tr>
<td>WCR</td>
<td>0.72</td>
<td>0.08</td>
<td>0.76</td>
<td>0.05</td>
</tr>
</tbody>
</table>

**Pretask Training and Collaborative Pair Dynamics**

RQ1 concerns whether pretask training promotes more collaborative pair dynamics during web-based L2 CW. Table 4 shows that ten pairs in the PT group demonstrated collaborative dynamics, and two pairs showed non-collaborative dynamics; four displayed collaborative dynamics, and eight non-collaborative dynamics in the NPT group. A group independence chi-square test found a relationship between group membership and collaborative pair dynamics \(\chi^2 = 6.171, p = 0.013\). The result suggests that pretask training promotes more collaborative pair dynamics during web-based L2 CW than no training.

**Table 4**

*Pair Dynamics Between Groups*

<table>
<thead>
<tr>
<th>Pair dynamics</th>
<th>PT Group (n = 12 pairs)</th>
<th>NPT Group (n = 12 pairs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Non-collaborative</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

**Pretask Training and Learning Opportunities**

RQ2 explores whether pretask training encourages more learning opportunities during web-based L2 CW than no training. Learner pairs in the PT group produced 52 content-related episodes \(M = 4.33, SD = 4.56\), five organization-related episodes \(M = 0.42, SD = 0.90\), and 193 LREs \(M = 16.08, SD = 11.22\). Learner pairs in the NPT group produced 22 content-related episodes \(M = 1.83, SD = 2.17\) and 77 LREs \(M = 6.42,
No organization-related episodes were produced in the NPT group. Mann–Whitney tests (Table 5) found no statistically significant differences in the number of content-related episodes ($U = 47.50$, $z = -1.438$, $p = 0.160$, $r = 0.29$) and organization-related episodes ($U = 54.00$, $z = -1.809$, $p = 0.319$, $r = 0.37$) between the groups. The results showed a statistically significant difference in the number of LREs; the PT group produced more LREs than the NPT group ($U = 29.00$, $z = -2.497$, $p = 0.012$, $r = 0.51$).

Table 5

<table>
<thead>
<tr>
<th>Episodes</th>
<th>PT Group ($n = 12$ pairs)</th>
<th>NPT Group ($n = 12$ pairs)</th>
<th>$U$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Content</td>
<td>4.33</td>
<td>4.56</td>
<td>1.83</td>
<td>2.17</td>
</tr>
<tr>
<td>Organization</td>
<td>0.42</td>
<td>0.90</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>LRE</td>
<td>16.08</td>
<td>11.22</td>
<td>6.42</td>
<td>7.77</td>
</tr>
</tbody>
</table>

Note. *$p < 0.05$

There was no difference in the number of content-related episodes between the PT and NPT groups, but there were differences in the resolution of these episodes between the two groups. Among the 52 content-related episodes produced in the PT group, 47 were resolved (90%; $M = 0.70$, $SD = 0.44$), and five were unresolved (10%; $M = 0.13$, $SD = 0.31$). Among the 22 content-related episodes produced in the NPT group, 10 were resolved (45%; $M = 0.27$, $SD = 0.45$), and 12 were unresolved (55%; $M = 0.31$, $SD = 0.47$). Mann–Whitney tests (Table 6) found the difference in the resolution of the content-related episodes between the two groups was statistically significant, with more content-related episodes resolved in the PT group ($U = 40.50$, $z = -1.993$, $p = 0.046$, $r = 0.41$). Additionally, 45 of the 52 content-related episodes in the PT group were resolved successfully (87%; $M = 0.69$, $SD = 0.44$), while 9 of the 22 content-related episodes in the NPT were resolved successfully (41%; $M = 0.26$, $SD = 0.42$). A Mann–Whitney test (Table 6) found that the difference in the number of successfully resolved content-related episodes between the two groups was statistically significant ($U = 37.50$, $z = -2.193$, $p = 0.032$, $r = 0.44$), with more successfully resolved content-related episodes in the PT group.

Table 6

<table>
<thead>
<tr>
<th>Outcome</th>
<th>PT Group ($n = 12$ pairs)</th>
<th>NPT Group ($n = 12$ pairs)</th>
<th>$U$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Resolved</td>
<td>0.70</td>
<td>0.44</td>
<td>0.27</td>
<td>0.45</td>
</tr>
<tr>
<td>Unresolved</td>
<td>0.13</td>
<td>0.31</td>
<td>0.31</td>
<td>0.47</td>
</tr>
<tr>
<td>Resolved Successful</td>
<td>0.69</td>
<td>0.44</td>
<td>0.26</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Note. *$p < 0.05$

Among the 193 LREs produced in the PT group, 161 were resolved (83%; $M = 0.72$, $SD = 0.35$), and 32 were unresolved (17%; $M = 0.28$, $SD = 0.55$). Among the 77 LREs produced in the NPT group, 21 were resolved (27%; $M = 0.24$, $SD = 0.39$), and 56 were unresolved (73%; $M = 0.34$, $SD = 0.44$). Mann–Whitney tests (Table 7) found the difference in the resolution of LREs between the groups was statistically significant, with the PT group resolving more LREs ($U = 27.00$, $z = -2.652$, $p = 0.008$, $r = 0.54$). Additionally, 159 of
the 193 LREs in the PT group were target-like resolved (82%; $M = 0.70$, $SD = 0.36$), whereas only 13 of the 77 LREs in the NPT group were target-like resolved (17%; $M = 0.14$, $SD = 0.23$). A Mann–Whitney test (Table 7) found that the difference in the number of target-like LREs between the two groups was statistically significant ($U = 15.00$, $z = -3.335$, $p = 0.000$, $r = 0.68$), with more target-like LREs in the PT group.

### Table 7

**Outcome of LREs Between Groups**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>PT Group $(n = 12$ pairs)</th>
<th>NPT Group $(n = 12$ pairs)</th>
<th>$U$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Resolved</td>
<td>0.72</td>
<td>0.35</td>
<td>0.24</td>
<td>0.39</td>
</tr>
<tr>
<td>Unresolved</td>
<td>0.28</td>
<td>0.35</td>
<td>0.34</td>
<td>0.44</td>
</tr>
<tr>
<td>Resolved Target-like</td>
<td>0.70</td>
<td>0.36</td>
<td>0.14</td>
<td>0.23</td>
</tr>
</tbody>
</table>

*Note. *$p < 0.01$

Regarding learner engagement levels, 41 of the 52 content-related episodes in the PT group were elaborate/elaborate (79%; $M = 0.67$, $SD = 0.42$), three were elaborate (6%; $M = 0.02$, $SD = 0.05$), five were limited (9%; $M = 0.04$, $SD = 0.09$), and three were limited/limited (6%; $M = 0.09$, $SD = 0.29$). In the NPT group, 6 of the 22 content-related episodes were elaborate/elaborate (27%; $M = 0.15$, $SD = 0.31$), one was elaborate (4%; $M = 0.08$, $SD = 0.29$), three were limited (14%; $M = 0.04$, $SD = 0.14$), and 12 were limited/limited (55%; $M = 0.31$, $SD = 0.47$). Mann–Whitney tests (Table 8) found that the difference in the content-related episode engagement between the groups was statistically significant, with more elaborate/elaborate content-related episodes generated in the PT group ($U = 29.00$, $z = -2.676$, $p = 0.007$, $r = 0.55$). Likewise, 102 of the 193 LREs in the PT group were elaborate/elaborate (53%; $M = 0.52$, $SD = 0.32$), 41 were elaborate (21%; $M = 0.16$, $SD = 0.26$), 26 were limited (14%, $M = 0.09$, $SD = 0.15$), and 24 were limited/limited (12%; $M = 0.23$, $SD = 0.31$). In the NPT group, 23 of the 77 LREs were elaborate/elaborate (30%; $M = 0.18$, $SD = 0.27$), nine were elaborate (12%; $M = 0.09$, $SD = 0.18$), one was limited (1%; $M = 0.01$, $SD = 0.05$), and 44 were limited/limited (57%; $M = 0.29$, $SD = 0.40$). Mann–Whitney tests (Table 9) found that the difference in LRE engagement between the groups was statistically significant, with more elaborate/elaborate LREs produced in the PT group ($U = 25.00$, $z = -2.750$, $p = 0.006$, $r = 0.56$).

In summary, pretask training encouraged more learning opportunities during web-based L2 CW. Learners who received pretask training produced significantly more and correctly resolved more LREs, and successfully resolved more content-related episodes. Regarding learner engagement level, learners who received pretask training produced more elaborate/elaborate engagement than those who did not.

### Table 8

**Level of Engagement in Content-Related Episodes Between Groups**

<table>
<thead>
<tr>
<th>Level of engagement</th>
<th>PT Group $(n = 12$ pairs)</th>
<th>NPT Group $(n = 12$ pairs)</th>
<th>$U$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Elaborate/Elaborate</td>
<td>0.67</td>
<td>0.42</td>
<td>0.15</td>
<td>0.31</td>
</tr>
<tr>
<td>Elaborate</td>
<td>0.02</td>
<td>0.05</td>
<td>0.08</td>
<td>0.29</td>
</tr>
<tr>
<td>Limited</td>
<td>0.04</td>
<td>0.09</td>
<td>0.04</td>
<td>0.14</td>
</tr>
<tr>
<td>Limited/Limited</td>
<td>0.09</td>
<td>0.29</td>
<td>0.31</td>
<td>0.47</td>
</tr>
</tbody>
</table>

*Note. *$p < 0.01$
Table 9

Level of Engagement in LREs Between Groups

<table>
<thead>
<tr>
<th>Level of engagement</th>
<th>PT Group ((n = 12 \text{ pairs}))</th>
<th>NPT Group ((n = 12 \text{ pairs}))</th>
<th>(U)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(M)</td>
<td>(SD)</td>
<td>(M)</td>
<td>(SD)</td>
</tr>
<tr>
<td>Elaborate/Elaborate</td>
<td>0.52</td>
<td>0.32</td>
<td>0.18</td>
<td>0.27</td>
</tr>
<tr>
<td>Elaborate</td>
<td>0.16</td>
<td>0.26</td>
<td>0.09</td>
<td>0.18</td>
</tr>
<tr>
<td>Limited</td>
<td>0.09</td>
<td>0.15</td>
<td>0.01</td>
<td>0.05</td>
</tr>
<tr>
<td>Limited/Limited</td>
<td>0.23</td>
<td>0.31</td>
<td>0.29</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Note. * \(p < 0.01\)

Table 10

Differences Between Pre- and Post-Test Writing Within Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Measures</th>
<th>Pre-Test ((n = 24))</th>
<th>Post-Test ((n = 24))</th>
<th>(t)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT Group</td>
<td>Content</td>
<td>4.40</td>
<td>0.94</td>
<td>4.92</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>Organization</td>
<td>4.42</td>
<td>0.82</td>
<td>4.60</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>CTU</td>
<td>2.09</td>
<td>0.34</td>
<td>2.49</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>MLC</td>
<td>6.77</td>
<td>0.69</td>
<td>6.54</td>
<td>0.55</td>
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<tr>
<td></td>
<td>WCR</td>
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<td>0.81</td>
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</tr>
<tr>
<td>NPT Group</td>
<td>Content</td>
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<td>0.39</td>
<td>2.34</td>
<td>0.40</td>
</tr>
<tr>
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<td>MLC</td>
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<tr>
<td></td>
<td>WCR</td>
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<td>0.05</td>
<td>0.74</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Note. * \(p < 0.05\)

Pretask Training and L2 Writing Development

RQ3 asks whether pretask training impacts learners’ individual L2 writing development in content quality and organization, and linguistic complexity and accuracy. Table 10 shows the results between pre- and post-tests of paired-sample \(t\)-tests. The PT group showed a statistically significant improvement in content quality \((t = -2.303, p = 0.031, d = 0.59)\) and produced both syntactically more complex (CTU: \(t = -4.471, p = 0.000, d = 1.03\)) and linguistically more accurate language (WCR: \(t = -10.046, p = 0.000, d = 1.27\)) from pre- to post-tests. The PT group also scored higher in the organization in the posttest but was not statistically significant \((t = -0.987, p = 0.334, d = 0.24)\). Regarding the NPT group, no significant improvement was found for content quality \((t = 2.378, p = 0.026, d = 0.45)\), organization \((t = 1.187, p = 0.247, d = 0.21)\), linguistic complexity (CTU: \(t = -1.148, p = 0.263, d = 0.28\); MLC: \(t = -1.859, p = 0.076, d = 0.60\)), and accuracy (WCR: \(t = 1.520, p = 0.142, d = 0.36\)) from pre- to post-tests.

Table 11 shows independent post-test \(t\)-tests results for the two groups. The content quality produced by the PT group was significantly better than that produced by the NPT group \((t = 2.906, p = 0.006, d = 0.84)\). The PT group also produced significantly more accurate language than the NPT group (WCR: \(t = 3.606, p = 0.001, d = 1.17\)). However, no significant results were found for organization \((t = 0.679, p = 0.501, d = 0.19)\) and linguistic complexity (CTU: \(t = 1.217, p = 0.230, d = 0.36\); MLC: \(t = -1.704, p = 0.098, d = 0.48\)).
In summary, pretask training fostered better individual L2 writing development. Learners who received pretask training before engaging in web-based L2 CW tasks improved the content quality and language accuracy of post-test writing.

**Table 11**

*Differences Between Groups on Posttest Writing*

<table>
<thead>
<tr>
<th>Measures</th>
<th>PT Group ( (n = 24) )</th>
<th>NPT Group ( (n = 24) )</th>
<th>( t )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>4.92 ( M ), 0.83 ( SD )</td>
<td>4.21 ( M ), 0.86 ( SD )</td>
<td>2.906</td>
<td>0.006*</td>
</tr>
<tr>
<td>Organization</td>
<td>4.60 ( M ), 0.69 ( SD )</td>
<td>4.48 ( M ), 0.58 ( SD )</td>
<td>0.679</td>
<td>0.501</td>
</tr>
<tr>
<td>CTU</td>
<td>2.49 ( M ), 0.43 ( SD )</td>
<td>2.34 ( M ), 0.40 ( SD )</td>
<td>1.217</td>
<td>0.230</td>
</tr>
<tr>
<td>MLC</td>
<td>6.54 ( M ), 0.55 ( SD )</td>
<td>6.97 ( M ), 1.13 ( SD )</td>
<td>-1.704</td>
<td>0.098</td>
</tr>
<tr>
<td>WCR</td>
<td>0.81 ( M ), 0.06 ( SD )</td>
<td>0.74 ( M ), 0.06 ( SD )</td>
<td>3.606</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

*Note.* *p* < 0.01

**Learners’ Perceptions of Pretask Training**

Table 12 shows the results from the exit questionnaire about perceptions and evaluation of the training from the PT group. Learners generally perceived that they benefitted from the training. In detail, the training helped them (a) understand the importance of peer interaction and peer feedback in L2 writing development (items 1, 2, and 10), (b) learn how to interact with peers and give feedback (items 3, 4, and 5), (c) notice mistakes in content, organization, and language (items 7 and 8), (d) attend more to peer feedback (item 6), and (e) understand how to help peers solve problems in English writing (item 9). These data provide the fidelity of implementation.

**Table 12**

*Learners’ Perception of Pretask Training*

<table>
<thead>
<tr>
<th>( n = 24 )</th>
<th>Item 1</th>
<th>Item 2</th>
<th>Item 3</th>
<th>Item 4</th>
<th>Item 5</th>
<th>Item 6</th>
<th>Item 7</th>
<th>Item 8</th>
<th>Item 9</th>
<th>Item 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>( M )</td>
<td>4.65</td>
<td>4.65</td>
<td>4.70</td>
<td>4.52</td>
<td>4.70</td>
<td>4.78</td>
<td>4.61</td>
<td>4.74</td>
<td>4.61</td>
<td>4.78</td>
</tr>
<tr>
<td>( SD )</td>
<td>0.83</td>
<td>0.78</td>
<td>0.88</td>
<td>0.90</td>
<td>0.82</td>
<td>0.80</td>
<td>0.94</td>
<td>0.81</td>
<td>0.84</td>
<td>0.85</td>
</tr>
</tbody>
</table>

*Note.* 6 = completely agree, 5 = mostly agree, 4 = agree, 3 = disagree, 2 = mostly disagree, 1 = completely disagree

**Discussion**

**Pretask Training Promotes More Collaborative Pair Dynamics**

The finding that learners who received pretask training demonstrated greater collaboration than those without training is in line with earlier research on pretask training (e.g., Kim & McDonough, 2011; Sato, 2017; Sato & Ballinger, 2012; Sato & Loewen, 2018), indicating that L2 learners can be trained to become better interactors in web-based CW contexts. To encourage collaboration during web-based CW processes, the pretask training materials explained the importance of peer interaction/feedback in L2 writing development, and demonstrated collaborative writing behavior in which writers gave reciprocal feedback and engaged in consistent response and idea-sharing to co-construct texts. The effect of the training was evident in the collaborative behavior of trainees. Of the 12 pairs, ten pairs (83%) in the PT group (Table 1) demonstrated collaborative pair dynamics, while only four pairs (33%) in the NPT group did. Learners in the PT group engaged in reciprocal idea-sharing more often, and they attended and responded more to peer
feedback (frequent responding language functions and other writing change functions), resulting in high mutuality in interaction. By contrast, learners in the NPT group (Table 2; 8 out of the 12 pairs) tended to either disregard requests for problem-solving (Pairs 4 and 8; see Examples 2 and 3) or merely engaged in peer editing with minimal (Pair 2) or no interaction (Pairs 5, 6, 7, 10, and 12), leading to low mutuality and cooperation in parallel. The collaborative behavior of the NPT group corroborates Kitade (2006). Kitade found the pressure for learners to respond to negotiation signals could be lessened in a web-based collaborative context, allowing learners to easily forget or ignore problem-solving requests from peers. However, as training was given, learners in this study attended and responded more to such requests. As Hsu (2019) suggested, to maximize the learning potential of L2 CW in web-based contexts, instructors may need to control for different characteristics of collaborative interaction. Pretask training could serve as a technique for such control by promoting collaboration and lowering cooperation in web-based L2 CW tasks.

**Pretask Training Encourages More Learning Opportunities**

Previous studies (e.g., Li & Zhu, 2017b; Storch, 2002a, 2002b) have suggested that pairs demonstrating collaborative dynamics generate more learning opportunities. This study found that learners who received pretask training produced significantly more LREs during web-based CW processes than those who did not receive training. Nevertheless, although the training materials provided examples of both LREs and content-and organization-related episodes, the learners did not produce more of the latter than those who did not receive training. Pretask training encouraged more learning opportunities in the language aspect than in content and organization. Problems in the local aspects (language) might be easier for the learners to detect than those in the global aspects (content and organization). Prior L2 writing instruction probably played a role, through drawing learners’ attention to grammar and language during the training and writing stage. Since noticing errors is necessary for providing feedback (Sato & McDonough, 2020), and given that the learners in the PT group could have greater language awareness after training, more errors in language were noticed, leading to more LREs. Another possibility could be the way texts were co-constructed during the CW processes. A scrutiny of the Google Docs history archives revealed that content ideas were not developed by the learners concurrently in both PT and NPT groups, resulting in the learners returning to the Google Docs pages with some developed content messages. In this condition, the training may have exerted less effect on content or organization negotiation and could have instead demonstrated how language forms were used to convey the content ideas, resulting in more LREs in the PT group.

Learners who received pretask training resolved more LREs and content-related episodes correctly and successfully than those who did not during the web-based CW processes, possibly because the training modeled reciprocal feedback and idea-sharing. The learners used similar interaction features targeted in the training sessions (Kim & McDonough, 2011), leading to more collaborative dynamics. This resulted in more opportunities for learners (Examples 1, 4, and 6) to pool their individual knowledge for problem-solving and improve performance beyond their individual levels (Ohta, 2001; Storch, 2005). In situations of uncertainty, learners seeking answers outside to give a reply in a web-based CW context was enhanced by the training (Example 1). Both situations could have led to more successful and target-like resolutions. Pretask training also brought forth more elaborate/elaborate engagement in problem-solving, indicating that the training encouraged both learners of a pair to address and solve problems together during the web-based CW processes. This more extensive engagement in the PT group may help explain the higher number of LREs and content-related episodes resolved correctly and successfully there.

**Pretask Training Improves Individual L2 Writing**

Learners who received pretask training improved the content quality and language accuracy of individual L2 writing than those who did not receive training in a web-based CW context. The improvement was fostered by collaborative pair dynamics and more elaborate engagement in solving content and language issues during the task. The learners both received and gave feedback. Receiving feedback provides an opportunity for cognitive comparison of a learner’s language and the given input (Ellis, 1994) and allows learners to know whether their content messages are effective (Rollinson, 2005). To provide feedback,
learners need to notice problems in their partner’s contributions and provide answers to the problems. The process of receiving and providing feedback enabled the learners to reprocess non-target-like linguistic features (Sato & Lyster, 2012) and reassess the adequacy and clarity of the conveyed content ideas in writing pieces. Since the trained learners engaged better in the reciprocal feedback loop and resolved content and language issues successfully and correctly most of the time during the web-based CW processes, they could have benefited more from peer collaboration, which could have fostered learners’ attention on the conveyance of content messages and language use, thereby improving the content quality and language accuracy of individual L2 writing.

The results, however, did not reveal that the trained learners outperformed those without training in the organization of the post-test writing. The finding is unsurprising as only a few organization-related episodes were produced in either group during the CW processes (only five in the PT and none in the NPT group). Regarding language complexity, the PT group significantly improved the CTU measure from pre- to post-tests but did not outperform the NPT group. It is possible that the pretask training materials only modeled how to resolve grammatical mistakes. Thus, when the learners worked with peers on language issues, they used the targeted feature and focused on solving grammatical mistakes, resulting in greater improvement in accuracy but not complexity.

**Conclusion**

This study has the following limitations. First, it revealed pretask training effects on encouraging more learning opportunities only in content and language aspects, not organization. Organization is tough for student pairs to work on (Neumann & McDonough, 2014). Therefore, future studies could provide separate training sessions on content, organization, and language, and spend more time training students on idea organization before engaging them in web-based CW tasks. Second, pretask training seems to be more effective in improving language accuracy of individual writing rather than complexity, particularity for MLC, a measure of phrasal-level complexification. Future studies on pretask training in web-based L2 CW tasks could model the collaboration process to condense information by reducing clauses into phrases, leading to more complexified language production that indicates a higher level of language proficiency (Norris & Ortega, 2009). Another limitation is personality, demographic, and gender variables in pairing between groups. Future studies should ensure the pairing is similar in these variables across groups. Additionally, one more limitation is the number of participants, and pretask training sessions included. More nuanced findings may be revealed by increasing the number of sessions from two in the present study and by including more learners.

The extent of peer collaboration affects the extent of collaborative learning opportunities and, ultimately, the language learning outcome in web-based CW contexts. It is essential to find ways to foster quality peer interaction to make web-based CW activities optimal sites for L2 learning and writing development. This study suggests that pretask training is a useful technique for encouraging learners to interact in ways that promote L2 learning during web-based CW processes.

**Acknowledgements**

I am grateful for the helpful comments from the anonymous reviewers and the guidance of the editors. This research was supported by the Ministry of Science and Technology, Taiwan [109-2410-H-033-022].

**Notes**

1. This study is approved by the Research Ethics Committee of National Taiwan University (approval number 202005ES139).

2. Writers at the B2 level can (a) write at length about topical issues and correct mistakes in the process,
(b) write clear and detailed descriptions on a variety of subjects, and (c) write a paper giving reasons in support of or against a particular viewpoint and explaining advantages and disadvantages of various options.

3. The two tests were pilot tested among a group of 10 students at the same writing level. The order of test implementation was counterbalanced. The Wilcoxon signed-rank tests showed no significant differences between the two tests in content ($z = -0.707, p = 0.480$) and organization ($z = -0.587, p = 0.557$) and linguistic complexity (CTU: $z = -0.663, p = 0.508$; MLC: $z = -0.306, p = 0.760$) and accuracy (WCR: $z = -0.205, p = 0.837$), which validates the comparability of the writing prompts.

4. IT: Providing a mini-lesson; E: Giving complements to encourage contributions; DM: Helping maintain the writing direction.

5. When peer feedback was accepted and the text revised by its writer, the changes were coded as self-writing by definition. Consequently, the number of other writing changes does not seem high.

6. Since no organization-related episodes were produced in the NPT group, no further analyses were performed between the two groups on these episodes.

7. An effect size of $r = 0.10$ was defined as small, $r = 0.30$ as medium, and $r = .50$ as large.

8. The group scored lower in the content quality of post-test writing.

9. A large portion of the prior L2 writing instruction the PT and NPT groups received focused on grammar.

References


Lawrence Erlbaum.


Appendix A. Pre-and Post-Test Individual Writing Tasks

Pretest Writing Topic

Read the following prompt.

Due to the rapid technology advancement in recent years, more universities in Taiwan have incorporated distance learning, a method of study which students and teachers are physically in different locations, into their curriculum. Many students embrace the new teaching approach while others prefer the traditional classroom learning environment.

Write a 4-paragraph expository essay to explore “the advantages and disadvantages of practicing distance learning in universities”. Include 2 main points (one advantage and one disadvantage) and any relevant details or examples to support the main points.

Please note that you need to pay attention to the following three areas in your essay: content, organization, and language quality.

Posttest Writing Topic

Read the following prompt.

Colleges and universities oftentimes require all students to take a certain number of “general education courses” as they work toward their degrees. This graduation requirement is intended to provide students with a wide breadth of learning opportunities needed to develop the well-rounded ability that goes beyond their professional knowledge and skills.

Write a 4-paragraph expository essay to explore “the role of general education courses in college curriculum”. Include 2 main points and any relevant details or examples to support the main points.

Please note that you need to pay attention to the following three areas in your essay: content, organization, and language quality.
Appendix B. Collaborative Writing Tasks

Peer Pressure

Read the following prompt

*The behavior of individuals is often influenced by people of the same age like classmates or people in the same situation such as co-workers. It is quite common for peers to behave in similar ways or share similar expectations. However, research has shown that teenagers tend to experience greater pressure from peers to change their attitudes, values, or behaviors in order to be accepted, which could result in either positive or negative effects.*

Write a 4-paragraph expository essay (approximately 500-750 words) to explore “the effects of peer pressure”. Include 2 main points and any relevant details or examples to support the main points.

Media Exaggeration

Read the following prompt

*In the non-stop cable news cycles, media channels are doing everything to attract viewers and beat their competitors. As a result, many non-stories are dressed up with dramatic music and flashy graphics to portray drama, fear and capture the attention of Taiwanese viewers. On a regular basis, in breaking news situations, channels get the facts wrong and make bold connections with little or no evidence.*

Write a 4-paragraph expository essay (approximately 500-750 words) to explore “the consequences of media exaggeration”. Include 2 main points and any relevant details or examples to support the main points.
Appendix C. Collaborative Writing Guidelines

1. How do you write your essays via Google Docs?

(a) Each student needs to work on the same piece of writing. Write your essay on your Google Docs page. Do not write your essay somewhere else and copy and paste it onto your Google Docs page.

(b) Read through the essay (both your work and your partner's). Give each other feedback and respond to the feedback using the comment function. Use the feedback to revise and edit the essay (you can revise and edit both your work and your partner's contributions).

(c) Be sure to (1) use a range of topic related vocabulary, (2) check the correctness of grammar (e.g. subject-verb agreement, number, verb tenses, etc.), (3) use a variety of sentence structures, (4) check spelling and punctuation, (4) check the appropriateness of content and idea organization, and (5) be original (no plagiarism!).

(d) Confirm the completion of your Google Docs collaborative writing, copy and paste the essay onto a Word document, and submit it to i-Learning.

2. How much do you need to write and how much time do you have for the completion of the essay?

At least 4 paragraphs, approximately 500-750 words within a week for an essay.
Appendix D. Pretask Training Materials

How to give feedback to and solve language problems with my peer?

- **Language-Related Problem 1**
  - Problematic sentence: Furthermore, unlike traditional classroom settings with a teacher to make sure that every student is paying attention, it is hard to do the exact same thing with distance course learning (Written by S2).

  S2: the exact? I don’t know what you mean.
  S2: It means to do the exact same thing as I mentioned previously.
  S2: Isn’t “exact” an adjective?
  S2: Yes, it is a noun!
  S2: No, it’s an adjective and it should be followed by a noun. I think we should change it to what you just said “the exact same thing.”
  S2: Yes, you’re right. I will correct it. Learn a lesson. Thanks!

  Corrected sentence: Furthermore, unlike traditional classroom settings with a teacher to make sure that every student is paying attention, it is hard to do the exact same thing with distance course learning.

How to give feedback to and solve language problems with my peer?

- **Language-Related Problem 2**
  - Problematic sentence: The following advice is given by some experts to help people overcome social media addiction (Written by S3).

  S4: Should be “advice” not “advices”.
  S5: But more than one advice is given.
  S6: I know, but advice is a non-countable noun.
  S5: I see. Sorry for the mistake. I will correct it.
  S6: Great! We should also correct the verb “are” to “is”.
  S5: Yes, because now we have a singular subject!

  Corrected sentence: The following advice is given by some experts to help people overcome social media addiction.

How to give feedback to and solve language problems with my peer?

- **Problematic content:**
  - Cellphones are very convenient, but they can also be rude. My Composition I teacher even talked to his girlfriend in the middle of class. People should turn off their cellphone anytime they are in public places that are supposed to be quiet. Maybe we should fine those people some money. We need some rules. (Written by S5)

  S6: The wording here in this topic sentence does not seem right. The phones aren’t rude. People are.
  S5: Do you have any suggestions? How do I revise it?
  S6: “But” they can also cause rude behavior?!
  S5: Sound better. OK. Let me revise it.

  Revised content:
  - Cellphones are very convenient, but they can also be rude. My Composition I teacher even talked to his girlfriend in the middle of class. People should turn off their cellphones anytime they are in public places that are supposed to be quiet. Maybe we should fine those people some money. We need some rules. (Written by S5)

How to give feedback to and solve language problems with my peer?

- **Problematic content:**
  - Cellphones are very convenient, but they can also be rude. My Composition I teacher even talked to his girlfriend in the middle of class. People should turn off their cellphones anytime they are in public places that are supposed to be quiet. Maybe we should fine those people some money. We need some rules. (Written by S5)

  S6: Maybe you don’t need to mention your teacher.
  S5: Too personal? Yes, I remember personal experiences aren’t strong support.
  S6: Maybe we can say people have loud conversations in public places.
  S5: Ok. Should we add some examples? Libraries or theaters?
  S6: Yes. We should.
How to give feedback to and solve organization problems with my peer?

- Problematic order of ideas:
  Gold is prized for two important characteristics. First of all, gold has a lustrous beauty that is resistant to corrosion. Another important characteristic of gold is its usefulness to industry and science. Gold is suitable for jewelry, coins, and ornamental purposes. Gold never needs to be polished and will remain beautiful forever. For many years, it has been used in hundreds of industrial applications, such as photography and dentistry.

  So: I think this paragraph does not hold together well.
  5B: You mean we need to re-organize some of the ideas?
  5B: Yes, I think this part should be moved in the position after the second sentence.
  5B: You mean after “First of all, gold has a lustrous beauty that is resistant to corrosion”?
  5B: Yes, because it explains why gold is suitable for ornamental purposes, and why it doesn’t need to be polished and can remain beautiful.
  5B: Because of gold’s lustrous nature and because of its resistance to corrosion?
  5B: Yes.
  5B: Sounds more logical. Let’s reorder the sentences.

How to give feedback to and solve organization problems with my peer?

- Problematic order of ideas:
  Gold is prized for two important characteristics. First of all, gold has a lustrous beauty that is resistant to corrosion. Another important characteristic of gold is its usefulness to industry and science. Gold is suitable for jewelry, coins, and ornamental purposes. Gold never needs to be polished and will remain beautiful forever. For many years, it has been used in hundreds of industrial applications, such as photography and dentistry.

  Revised order of ideas:
  Gold is prized for two important characteristics. First of all, gold has a lustrous beauty that is resistant to corrosion. Gold is thus suitable for jewelry, coins, and ornamental purposes. Gold never needs to be polished and will remain beautiful forever. Another important characteristic of gold is its usefulness to industry and science. For many years, it has been used in hundreds of industrial applications, such as photography and dentistry.

  So: OK.
  5B: Sounds more logical. Let’s reorder the sentences.
Appendix E. Exit Questionnaire

1. Through the ppt instruction on collaborative writing (i.e., explanations and examples of feedback giving and responding), I understand the concepts of peer interaction and peer feedback.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

2. Through the ppt instruction on collaborative writing, I understand how peer interaction and peer feedback contribute to L2 writing development.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

3. Through the ppt instruction on collaborative writing, I was able to get an idea of how I could give feedback.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

4. Through the ppt instruction on collaborative writing, I was able to get an idea of how I could interact with my partner better.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

5. I was able to give my partner more feedback after the ppt instruction on collaborative writing.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

6. I attended more to the feedback from my partner after receiving the ppt instruction on collaborative writing.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

7. I noticed more of my own language errors, as well as my partner's, after the ppt instruction on collaborative writing.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

8. I noticed more of my own errors in content development and ideas organization, as well as my partner's after the ppt instruction on collaborative writing.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

9. Through the ppt instruction on collaborative writing, I was able to get an idea of how I could help my partner solve problems in English writing.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree

10. I think peer interaction and peer feedback are useful for improving my English writing.

- [ ] Completely agree
- [ ] Mostly agree
- [ ] Agree
- [ ] Disagree
- [ ] Mostly disagree
- [ ] Completely disagree
# Appendix F. Analytical Scale for Quality of Content and Organization of Essays

<table>
<thead>
<tr>
<th></th>
<th>7-8 points</th>
<th>5-6 points</th>
<th>3-4 points</th>
<th>1-2 points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content</strong></td>
<td>Topic is well developed. The thesis statement states the specific topic of the essay. Topic sentences are clear and focused. Main ideas are supported by strong and convincing details and/or examples. There are no irrelevant or redundant supports. The conclusion paragraph contains good summary of the main points.</td>
<td>Topic is adequately developed. There are occasional minor problems with depth of development and unity. The thesis statement needs to be sharper. Topic sentences are present but controlling ideas are imprecise. Main ideas are supported by mostly strong and convincing details and/or examples. Supports are mostly relevant and appropriate. The conclusion paragraph contains appropriate summary of the main points.</td>
<td>Topic is somehow developed. The thesis statement is obscure. Topic sentences are not present/appropriate OR controlling ideas are not evident in the topic sentences. Main ideas are somehow supported by details and/or examples. However, some of the supports are either irrelevant, redundant, vague, or insufficient. The conclusion paragraph contains somewhat adequate summary of the main points.</td>
<td>Topic is inadequately developed. The essay contains either none or more than one thesis statement. There is no clear central; topic sentences are difficult to rate. There are too many irrelevant, redundant, vague and/or insufficient details/ examples. The conclusion paragraph contains inadequate summary of the main points.</td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td>Information is logically organized and effectively sequenced with effective use of transitions.</td>
<td>Information is mostly organized and sequenced with mostly effective use of transitions.</td>
<td>Information is loosely organized and sequenced. There are several problems with cohesion, sequencing, and flow of ideas. Relationship between ideas is sometimes unclear.</td>
<td>Obvious lack of organization. Relationship between ideas often unclear. Difficult to follow.</td>
</tr>
</tbody>
</table>
About the Author

Hsiu-Chen Hsu is a professor in the Department of Applied Linguistics and Language Studies at Chung Yuan Christian University. Her areas of research include computer-mediated language learning, task-based language teaching, and computer-mediated collaborative second language writing.

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