

EXPLORING HOW COLLABORATIVE DIALOGUES FACILITATE SYNCHRONOUS COLLABORATIVE WRITING

Hui-Chin Yeh, National Yunlin University of Science and Technology

Collaborative writing (CW) research has gained prevalence in recent years. However, the ways in which students interact socially to produce written texts through synchronous collaborative writing (SCW) is rarely studied. This study aims to investigate the effects of SCW on students' writing products and how collaborative dialogues facilitate SCW. Following an initial analysis, 54 students were divided into 18 groups; six groups with higher proportions of collaborative dialogue (HCD), six groups with median proportions of collaborative dialogue (MCD), and six groups with lower proportions of collaborative dialogue (LCD). The data collected includes the students' three reaction essays, their transcripts of text-based collaborative dialogues, and their writing process logs. The results showed that there were significant differences between the LCD, MCD, and HCD groups in terms of fluency and accuracy of their reaction essays. Through collaborative dialogues, students benefitted from text-based synchronous communications, such as clarifying their linguistic misconceptions, and receiving immediate feedback to help resolve their writing problems. The findings suggest that students could be provided with more opportunities for collaborative dialogues during the entire writing process, including the stages of generating ideas, writing reaction essays, and editing.

Keywords: Collaborative Learning, Writing, Collaborative Dialogues

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INTRODUCTION

Writing is an important skill for college students, as “professional and academic success in all disciplines depends, at least in part, upon writing skills” (Cho & Schunn, 2007, p.409). For many English as a Foreign Language (EFL) teachers, developing students' writing skills has proved challenging. Teachers often have a limited understanding of students' writing processes. An understanding of this process is necessary for them to help students develop into proficient writers (Florio-Ruane & Lensmire, 1990). EFL teachers' writing pedagogy is often derived from their own learning experiences as a pupil, rather than from the evaluation and observation of students' actual writing processes (Florio-Ruane, 1989). For many teachers, understanding the difficulties that students have in writing is influenced by personal experience and may not address the specific needs of every student. These problems are often exacerbated by too much emphasis on corrections of grammatical errors in students' writing. While this is often common practice in L2 writing instruction, these teaching approaches neglect the global view of writing, such as the incorporation of brainstorming ideas and organizing writing into logical paragraphs (Lee, 2004; Sotillo, 2000). As a consequence, in recent years many researchers and educators have been looking for an effective approach to enhance students' writing (e.g. Elola & Oskoz, 2010; Kessler & Bikowski, 2010)

Collaborative Writing

The prevalence of collaborative writing (CW) research in recent years attests to the potential contributions of CW in different aspects, such as higher quality of writing (Beck, 1993; Storch, 1999; Storch, 2005), a better understanding of the reader-writer relationship (Leki, 1993), and the acquisition of writing

knowledge, including grammar, vocabulary usage, and text structures (Kowal & Swain, 1994; Swain & Lapkin 1998). CW is defined as “collaborators producing a shared document, engaging in substantive interaction about that document, and sharing decision-making power and responsibility for it” (Allen, Atkinson, Morgan, Moore, & Snow, 1987, p. 70). CW focuses on the social interaction process, where two or more people, through discussion, work together to construct written documents, reach consensus on resolutions of questions and quality of work, and coordinate individual contributions on various aspects of writing (e.g. Elola & Oskoz, 2010; Kessler & Bikowski, 2010; Storch, 1999; Storch, 2005). In the social interaction process, students contribute their particular ideas or expertise, while taking into account others’ perspectives, in order to collaboratively complete a writing task (Speck, Johnson, Dice, & Heaton, 1999).

Some potential Web 2.0 technologies for CW include Wiki and Google Docs. Wiki refers to an asynchronous networking tool where users have equal opportunities to asynchronously organize, compose, and revise content (Kessler, 2009; Lee, 2010; Elola & Oskoz, 2010) at any time. One potential use of Wiki is its tracking tool, “History.” It documents the collaborative writing processes so that teachers can recognize the changes students have made on texts, and trace who makes the changes. Google Docs refers to a synchronous and asynchronous networking tool that allows writers to share and access written documents over the internet in real time. Students can either synchronously or asynchronously create, edit, or revise written documents, with synchronous communication supported by chat rooms. The tracking tool is provided in Google Docs to manage different versions of written documents, as well as record the time and date they are modified. While asynchronous communication provides a useful method of communicating with peers, synchronous methods permit the immediate addressing of key topics across a potentially wide audience.

Researchers have recognized some of the benefits of text-based synchronous communication, which (a) focuses on meaning rather than on form (Kessler, 2009), (b) improves fluency and accuracy of communication (Elora & Oskoz, 2010; Lee, 2001), (c) values the chance to share ideas and provide feedback (Ware & O’Dowd, 2008) and (d) enhances language learning motivation in general (Conelos & Oliva, 1993; Oliva & Pollastrini, 1995). Students also benefit from text-based synchronous communication by immediately having their linguistic misconceptions and writing problems addressed. They receive timely constructive feedback from peers which helps them make their writing more meaningful and comprehensible to others (Lee, 2002; Webb, 1989). For example, Lee (2002) designed collaborative writing activities to enhance students’ writing proficiency through a synchronous discussion forum in *Blackboard*, which acts as an online communication tool allowing students to have synchronous interactions and consultations with others, in order to collaboratively accomplish writing tasks. In observing real-time synchronous collaborative writing processes, students are exposed to linguistic input alongside the vocabulary or sentence structures from written documents that they can co-construct and co-edit (Lee, 2002). As a result, students may apply collective linguistic input to self-correct or edit texts. A SCW tool offers a text-based synchronous forum for students to carry out collaborative dialogues and obtain immediate feedback in congruence with face-to-face (F2F) collaborative dialogues (Blake, 2000; Kessler & Bikowski, 2010; Smith, 2003). Swain and Lapkin (2002) perceive collaborative dialogues as an externalization of thoughts which can be “scrutinized, questioned, reflected upon, disagreed with, changed, or disregarded” (p. 286). Since text chats provide an avenue for students to reflect and negotiate meanings with peers on the basis of collaborative dialogues in written forms, they also allow students to elaborate on their ideas more clearly and attend to linguistic output so that students can better understand the comments and feedback that lead to L2 improvements (Koschmann, Kelson, Felovich, & Barrows, 1996; O’Sullivan, Mulligan & Dooley, 2007). For example, Wells and Chang-Wells (1992) explored the effectiveness of text-based synchronous collaborative dialogues upon argumentative writing. Their results showed that the text-based synchronous collaborative dialogues fostered literate thinking development. That is, students performed much better when elaborating their ideas in written argumentative essays,

while given the opportunity to perform text-based synchronous collaborative dialogues.

Research Gap in CW Research

The social interaction process, namely how students produce written texts through CW, is difficult to conceptualize and observe empirically, and so it is not well understood (Swain, 2000). According to sociocultural theory, the social interaction process cannot be disregarded, since language learning always occurs in the process of social interaction rather than in writing products (Donato, 1994; Lee, 2004b). Studies have shown that the social interaction process can provide valuable information which may not be directly observed from writing products (Masoodian & Luz, 2001). Understanding what factors may affect the quality of the social interaction process when incorporating Web 2.0 tools is valuable. For example, Lee (2004a) examined the social processes of networked collaborative interaction by using *Blackboard*. The results showed that students' language proficiency, computer skills, and ages, are the core factors that determined the success of online negotiation and influenced students' learning motivation. Brodahl, Hadjerrouit, and Hansen (2011) also pointed out key factors, such as learning tasks, course content, perceptions toward tools, and prerequisite knowledge, which may result in different levels of collaboration and learning outcomes in CW.

Currently, the effectiveness of SCW remains relatively unexplored. Many scholars (e.g. Lowry, Curtis, & Lowry, 2004; Storch, 2005) have addressed compelling needs for more studies to look into social interaction processes in synchronous modes. Only a few L2 studies have attempted to investigate collaborative dialogues in SCW (e.g., Digiovanni & Nagaswami, 2001; Jones, Garralda, Li, & Lock, 2006). Among these attempts, collaborative dialogues have been limited to the co-editing stage, where students edit and provide feedback on peers' texts in order to produce a final writing product (Storch, 2005). Nixon (2007) similarly argues that "most of the conditions under which students are given opportunities in the classroom to engage in dialogues are concerned with only one part of the entire writing process," (p. 6) namely co-editing. Jones, Garralda, Li, and Lock (2006) also examined collaborative dialogues of L2 students in both online and F2F in co-editing, based on two types: initiating moves (e.g., offer, directive, statement, and question) and responding moves (e.g., clarification, confirmation, acceptance, rejection, and acknowledge). Results showed that students raised more questions and made more comments online than through F2F in the co-editing process. They also reported that collaborative dialogues in co-editing focus much more on the micro-level feedback (e.g., vocabulary and grammar) in the F2F session, and are more concerned with the macro-level feedback (e.g., content, organization, and topic) in online co-editing.

Collaborative dialogues in co-editing seemed to result in superficial levels of writing in which students only concentrated on identifying either micro-level or macro-level writing problems (Jones et al., 2006). When students are only engaged in the final stage of writing, namely co-editing, they might lose sight of the entire writing process for generating insights into the deeper meaning of the writing (Hirvela, 1999). To discourage the collaborative dialogues from centering on superficial CW processes of simply finding and fixing errors, and raising the process to a comprehensive level for the total extent of writing, L2 instructors and researchers are encouraged to design the tasks which involve the entire process of CW.

Research Questions:

The core objectives of the current study, scheduled to run for one semester, were to investigate the effects of SCW upon writing products and how collaborative dialogues facilitated SCW. Based on the research purposes, the research questions included:

1. Do highly collaborative groups produce higher quality writing products?
2. How do the collaborative dialogues facilitate SCW?

Research Background

In this current study, 18 groups, comprised of three students each, were required to write three reaction essays synchronously and collaboratively. The researcher, in the role of instructor, assisted the 54 EFL students in writing the reaction essays using EtherPad (EP). Like Google Docs, EP is a word processing software application that includes similar functionalities to support synchronous writing, editing, and text chatting, and documents historical records of writing processes and different versions of written products. EP is free open-source software that users can use without license restrictions. Writers can collaboratively write and edit a shared document in real time with text chats embedded in the same page (see Figure 1). Each author in EP is provided with a unique text highlighting color and authors can save the different versions of drafts or edit them at any time. Periodically saved documents are historically recorded for writers to visualize the developmental process using a flash form in *Time Slider* (see Figure 2). To date, EP has yet to be examined as a potential venue for SCW in L2 writing classrooms (Chu, Kennedy, & Mak, 2009).

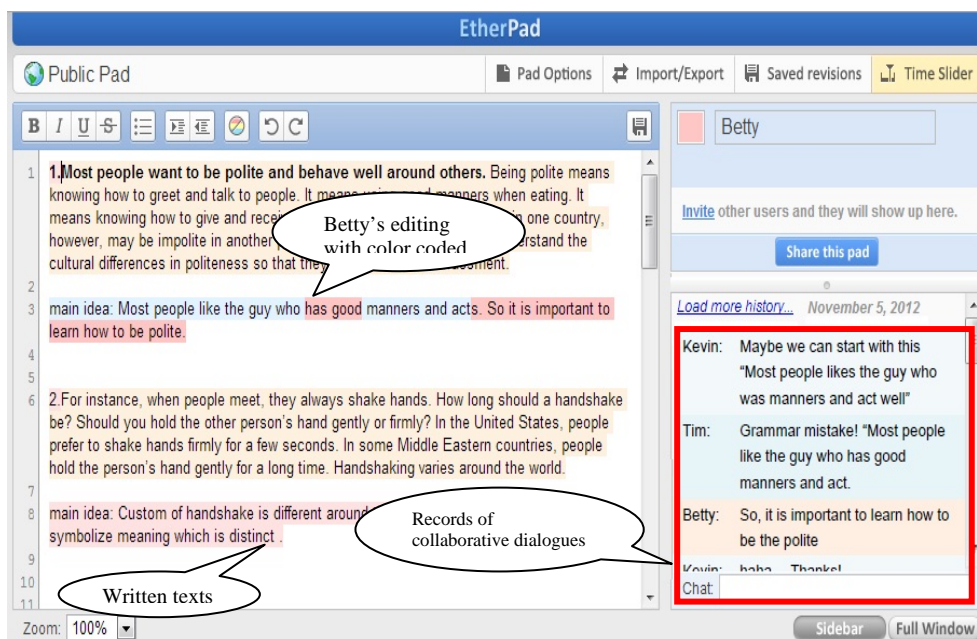


Figure 1. Real time collaborative writing in EtherPad

In writing the reaction essay, the students were required to read an article assigned to them by the instructor. After reading, the students collaborated with their group members to write down how they reacted to the assigned reading. The students were given one-hour out of a two-hour class on three occasions during a semester, to complete the writing of three reaction essays. The students were also required to continue to complete the SCW tasks after class in their own time. Through collaborative writing, students could exchange their understanding and knowledge about writing conventions, the reader-writer relationship, and genre rules to produce high quality reaction essays (Kowal & Swain, 1994; Leki, 1993; Swain & Lapkin, 1998).

While writing the reaction essay, the students were encouraged to use text chats in the right column of EP to negotiate meanings with each other throughout the entire SCW process. After completing and saving the reaction essay in the EP system, the students obtained a hyperlink to their written text, which was generated automatically by the EP system. Each group then posted the hyperlink in an online course management system, E-Campus, for the instructor and other students to read.

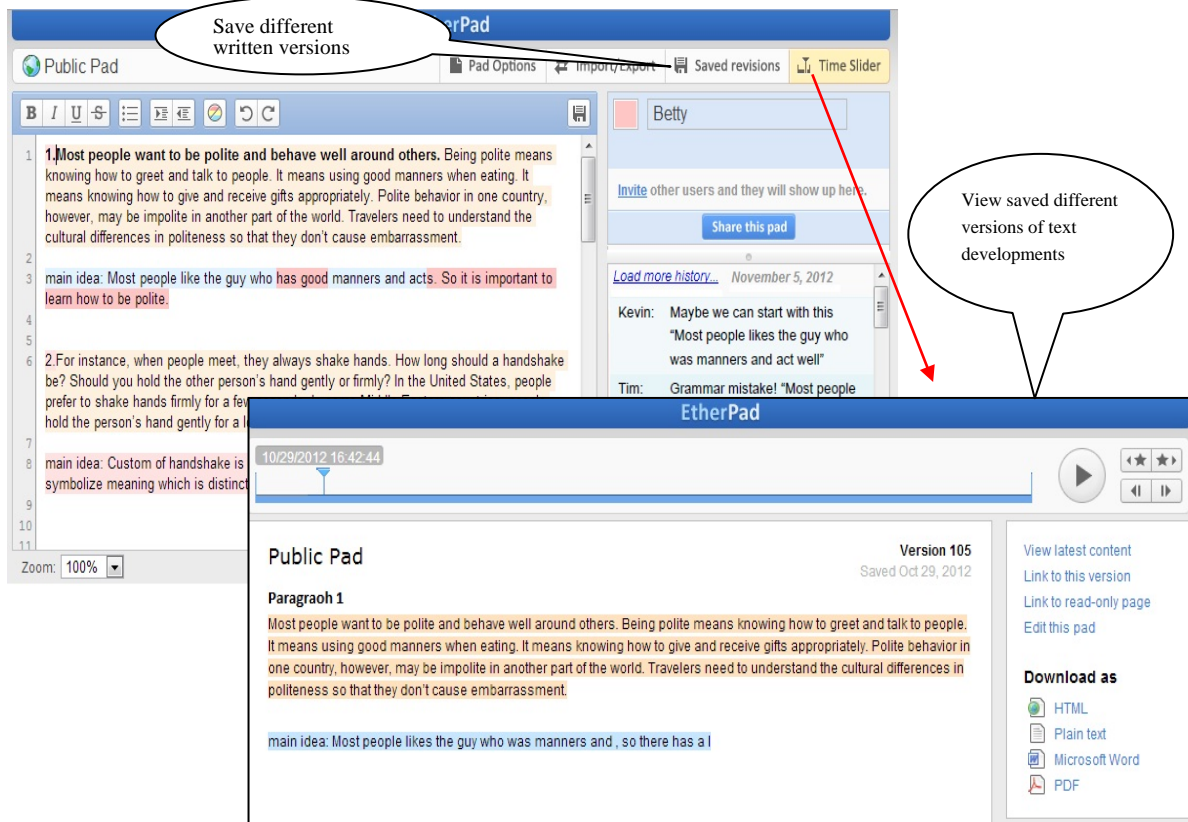


Figure 2. Time Slider as the tracking tool to view different saved versions

METHODOLOGY

Participants

The 18 groups consisted of 54 non-English major students registered in a two-credit college course, “Vocabulary and Reading”, at a university in central Taiwan. These non-English majors were first-year students from the Colleges of Management, Design, and Engineering. The 54 students had been learning EFL for more than 10 years and were not proficient in English writing, which required higher cognitive levels in application, organization, and integration of existing English writing knowledge. Individual students from the 18 groups took the writing section of TOEFL to measure their writing proficiency during the first week of the semester. Their writing proficiency scores ranged from 11 to 22 on a 30-point scale ($M = 15.9$).

The students confirmed their willingness to participate by signing a consent form informing them of the research scope and data to be collected. They were also informed that they could withdraw from the study at any time. All names were displayed as pseudonyms in written communications to ensure the participants’ anonymity.

Data Collection and Analysis

Data sources included (a) the students’ three reaction essays, (b) the transcripts of text-based collaborative dialogues, and (c) the students’ writing action logs from *Time Slider*, the system function providing historical records of the student writing processes using EP. The three essays and collaborative dialogues were analyzed to examine the effects of the SCW upon the fluency and accuracy of the writing products and how collaborative dialogues facilitated SCW.

At the initial analysis stage, the 18 groups were classified into groups with high proportions of collaborative dialogue (HCD groups), median proportions of collaborative dialogue (MCD groups), and low proportions of collaborative dialogue (LCD groups). To determine the HCD, MCD and LCD groups, the researcher first counted the frequency of collaborative dialogues in each of the 18 groups. The minimal analytical unit to count the frequency of the collaborative dialogue was turns. Each time a person typed some text in a text chat counted as one turn. The HCD groups were in the top 33% of the collective mean of the 18 groups' collaborative dialogue frequency, the MCD groups were in the median 34%, and the LCD groups were in the bottom 33%.

The English writing proficiency of the HCD groups ranged from TOEFL writing scores of 13 to 22 ($M = 16.5$). The range of the MCD groups' writing proficiency was 13 to 20 ($M = 16.1$). The LCD groups' writing proficiency was 11 to 19 ($M = 15$). A one-way analysis of variance (ANOVA) showed no-significant differences ($F = 0.398$, $p > .05$) between the HCD, MCD, and LCD groups in terms of students' writing proficiency. In other words, the HCD, MCD, and LCD groups were evaluated as having equivalent writing proficiency.

The rubrics, which include the major generic elements for reaction essays, were used to rate the three essays. The T-units as "one main clause plus whatever subordinate clauses happen to be attached to or embedded within it" (Hunt, 1966, p. 735) served as the references to measure the text quality of student essays in terms of fluency (Frequency of T-unit use), and accuracy (the percentage of error-free T units) (Polio, 1997; Spelman Miller, 2006). Meetings were held regularly between the researcher and the research assistant to cross-examine the reliability of the analysis of fluency and accuracy. The inter-rater reliability of the text fluency and accuracy were determined as .88 and .84 respectively.

A multivariate analysis of variance (MANOVA) was conducted to investigate whether the proportions of collaborative dialogues had any effect on Essay 1, Essay 2, and Essay 3 in terms of fluency and accuracy respectively. The researcher selected one HCD group's reaction essay and one LCD group's reaction essay to serve as sample texts to more closely analyze whether highly collaborative groups produced higher quality writing products. The selection strategy was typical case sampling (Patton, 1990), as it is often used to describe and illustrate "a program or a participant to people not familiar with the program" (p. 173). As Patton indicates, cases could be selected from "a demographic analysis of averages or other programmatic data that provide a normal distribution of characteristics from which to identify "average" examples" (p. 174). The sample essays of the HCD and LCD groups were selected from essays where fluency and accuracy scores were close to the LCD and HCD groups collective mean scores.

The collaborative dialogues were analyzed using content analysis (Weber, 1990; Patton, 1990) to explore how the collaborative dialogues facilitated SCW. The researcher and the research assistant first coded the transcripts of the dialogues into 627 meaningful turns. Then, the researcher and assistant categorized the meaningful statements into different thematic units for the three writing stages. The collaborative dialogues, centering on the stages of (a) generating ideas, (b) writing reaction essays, and (c) editing the reaction essays, were analyzed. The inter-rater reliability of the coding for the three stages was determined as .86, .82, and .87. The examples of collaborative dialogues were illustrated for different stages. The main ideas were interpreted by offering examples, drawing conclusions, and making inferences. One of the HCD groups was selected by the typical case sampling method to explain how the students used the collaborative dialogues to help (a) generate ideas, (b) write the reaction essays, and (c) edit the reaction essays during the entire SCW process. The action logs served as the supplementary source of information that triangulates the research findings.

RESULTS

RQ1: Do highly collaborative groups produce higher quality writing products?

A MANOVA was conducted to determine whether the proportions of collaborative dialogues had any

effect on the three reaction essays in terms of fluency and accuracy respectively. The results showed that the proportions of collaborative dialogue in the different groups had a significant effect on Essay 1, Essay 2, and Essay 3 (Pillai's Trace = 1.73, $F = 12.14^{***}$) in terms of fluency and accuracy. The post hoc analysis with Sheffé Test showed that there were significant differences between the LCD, MCD, and HCD groups in the three essays in terms of fluency and accuracy (Table 1). The results showed that highly collaborative groups can produce high quality reaction essays.

Table 1. MANOVA analysis of the LCD, MCD and HCD groups' essays in terms of fluency and accuracy

DV	MANOVA			ANOVA
	Pillai's Trace	<i>F</i>	<i>F</i>	Post hoc
Essay 1-fluency	1.73	12.14 ^{***}	19.40 ^{***}	MCD>LCD MCD<HCD
Essay 2-fluency			18.38 ^{***}	MCD>LCD MCD<HCD
Essay 3-fluency			17.48 ^{***}	MCD>LCD MCD<HCD
Essay 1-accuracy			14.74 ^{***}	MCD>LCD MCD<HCD
Essay 2-accuracy			13.29 ^{***}	MCD>LCD MCD<HCD
Essay 3-accuracy			19.23 ^{***}	MCD>LCD MCD<HCD

Note: ***<0.01

To examine how the collaborative dialogues facilitated students' writing performance, one HCD group's reaction essay and one LCD group's reaction essay were selected as sampling texts to explain how their collaborative dialogues helped improve their writing products to different extents (see Table 2 & 3).

Table 2. Examples of the Reaction Essays Selected from the HCD Group and the LCD Group

Group	Examples of the main idea	Examples of supporting ideas	Fluency Scores	Analysis of reaction essays
LCD	We do not think it is fair. Because his prosthetic legs are less flexible and cooperative than normal.	So, we think disabled athletes should not compete with able-bodied athletes at same time.	41	No supporting ideas are used to support the main idea
HCD	Although it is difficult to make the competition fair in the official game, here are some methods to aid you on how to be fair in the competition.	First , you can find a prestigious person to preside over the game. Second , it is also good to make some rules in advance. Each player would be required to follow them to make the competition fair. Finally , no un-sportsman like conduct, every player should have fun.	90	Three concrete supporting ideas are used to strengthen the main idea

The MCD groups' reaction essays were not presented, as the essays displayed similar findings to the ones produced by the HCD groups. As shown in Table 3, the HCD group's main idea was presented in the first sentence of the reaction essay, noting "Although it is difficult to make the competition fair in the official game, here are some methods to aid you on how to be fair in the competition." To support this main idea, the HCD group proposed three supporting ideas, marked by the transition words *first*, *second*, and *finally*.

Table 3. Examples of the Reaction Essays Selected from the HCD Group and the LCD Group

Group	An excerpt from the reaction essays	Analysis of reaction essay:
LCD	We do not think that it is fair. <u>Although</u> his story makes us feel impressive. Overall, we believe that the normal person would have more advantages. <u>Because</u> his prosthetic legs are less flexible and cooperative than normal. So, we think disabled athletes should not compete with able-bodied athletes at same time.	Incorrect use of subordinating conjunctions
HCD	<u>Although</u> it is difficult to make the competition fair in an unofficial game, here are some methods to make the official game fair. First, you can find a prestigious person to preside over the game. Second, it is also good to make some rules for each player to follow to make the competition fair. Finally, no un-sportsman like conduct, every player should have fun	Correct use of subordinating conjunctions and transition words

The LCD group, however, wrote their reaction essays without providing supporting ideas and examples in the reaction essays. Table 2 shows that, in a selective reaction essay from one of the LCD groups, the supporting ideas of the topic sentence were not elaborated upon before reaching the conclusion. As a result, the reaction essays of the LCD groups were rated less fluent (a score of 41), when compared with the essays submitted by the HCD groups (a score of 90).

The results suggest that students' active engagement in collaborative dialogue with their peers could have had a positive impact on the fluency and accuracy of the essays. The HCD groups made fewer grammatical errors compared with the LCD groups when writing the reaction essays (see Table 2, 3, and 4), the LCD groups' work often contained grammatical errors such as when using pronouns and subordinating conjunctions. In the LCD groups it was often hard to locate the antecedent of the pronoun. For example, the LCD group started writing the reaction essay with the passage "*We do not think that it is fair. Although his story makes us feel impressive. Overall, we believe that the normal person would have more advantages. Because his prosthetic legs are less flexible and cooperative than normal*" in which the antecedent of the possessive pronoun *his* remains unclear and may refer to either the noun phrase *normal person* or *the disabled person* in the text. This example also shows that the LCD group had difficulty using conjunctions correctly.

Table 4. Proportions of the Collaborative Dialogues During SCW

Group	Generating Ideas		Writing reaction essays		Editing reaction essays		Total
HCD	241	(28%)	537	(61%)	96	(11%)	874
MCD	201	(28%)	434	(60%)	87	(12%)	722
LCD	152	(29%)	304	(58%)	66	(13%)	522
Total	594	(28%)	1275	(60%)	249	(12%)	2118

RQ2: How do the collaborative dialogues facilitate SCW?

All of the students were encouraged to employ collaborative dialogues to discuss how to (a) generate ideas, (b) write reaction essays, and (c) edit the reaction essays. The results showed that collaborative dialogues often took place during the process of writing reaction essays. Sixty per cent of the collaborative dialogues centered on how to write the reaction essays, 28% of the collaborative dialogues centered on how to generate ideas, and 12% centered on how to edit the reaction essays (see Table 4). The proportion of collaborative dialogues that centered on how to write reaction essays was about twice the proportion of collaborative dialogues that centered on how to generate ideas and about five times that centered on editing the reaction essays. The collaborative dialogues from one of the HCD groups were selected as an example to demonstrate how collaborative dialogues facilitated students to (a) generate ideas, (b) write the reaction essays, and (c) edit the reaction essays during the entire SCW process.

The students began writing the reaction essays collaboratively by using collaborative dialogues to generate writing ideas, as shown in Table 5. The students initiated the conversations by addressing their concerns on the writing topic.

Table 5. Examples of how collaborative dialogues facilitate the HCD group to generate ideas

Interaction process	Collaborative dialogues
Formulating the writing topic	<p>Tim: There are many directions we may go about for this essay. Our reading is about “the handicapped should not compete against able-bodied athletes”</p> <p>Amy: What do we want to write about?</p> <p>Tim: Maybe we can write about fairness.</p> <p>John: Our topic could be “In an informal competition, how to judge whether it is fair or not?”</p>
Eliciting ideas	<p>Amy: Do you have any ideas?</p> <p>Tim: Yes. We can discuss our ideas first. We may start with main ideas and supporting ideas first.</p>
Contributing ideas	<p>Amy: First, enjoy the competition without cheating. Second, look for a prestigious person to host the competition.</p> <p>John: Third, set up the rules. Anything else?</p> <p>Tim: But these came from our reading. We should have our own opinions.</p> <p>Amy: I am still thinking...How about cultivate good sportsmanlike conduct? Is that appropriate?</p>
Iterative seeking clarification	<p>John: I am not sure. Is there any relation between good sportsman like conduct and holding a fair competition?</p>
Explaining	<p>Amy: Yes, if you have good sportsmanlike conduct, you will enjoy yourself at the game. You do not care about the contest results</p> <p>John: I don’t quite understand.</p>
Iterative clarifying	<p>Amy: By “good sportsmanlike conduct”, I mean joining in the contest for self-accomplishment not for competition with others.</p> <p>Tim: O.K. it will be a direction for us to write about. To discuss the purpose of being in a competition.</p>

As shown in Table 5, Tim proposed that, “There are many directions we may go about for this essay” and they started to discuss how to write and organize their ideas in an essay. Cognitive conflicts occurred

when John was confused with Amy's statements and asked Amy to provide further elaborations to clarify the relation between ideas. Through constant meaning negotiations, the group members and Amy resolved emerging confusion, reached a consensus on how to use the main and supporting ideas to strengthen their reaction essays, and determined a writing topic together.

After generating ideas, the students used the proposed ideas to write their reaction essays. When writing the reaction essays, the collaborative dialogues assisted the students in clarifying any misunderstanding of English vocabulary and helped them understand how to write and develop ideas. John and Amy started the writing task by listing the developed writing ideas they had generated in English. As shown in Table 6, while constructing the English sentences, John was hindered by his limited English vocabulary and asked Amy about the meaning of competition by saying "Does competition mean the person who joins in the contest?" Based on Amy's responses, John recognized competition as the noun of the verb to compete, and used player to identify people who compete with each other in contests. However, the other group member Tim did not agree with John's English translation of the word player, as people who join in a contest, and provided the noun competitor, as the other English translation of people who compete in a contest. By receiving feedback from Tim, John expanded his vocabulary and usage of player and competitor.

After listing the developed writing ideas in English, Amy discussed with Tim and John about how to integrate the developed writing ideas into a passage by noting "We could first discuss how to integrate the content." Tim then responded, "We can write down the main idea, followed by providing examples." John also suggested that some transition words (such as first, second, and finally) could be used to help connect the ideas between sentences for readers to follow the arguments.

Table 6. Examples of how collaborative dialogues facilitate the HCD group to write the reaction essay

Interaction process	Collaborative dialogues
Seeking clarification	John: Does the word "competition" refer to people who enter a contest?
Providing feedback	Amy: Probably not. It is the noun for the verb to "compete". John: Fine, then we can use the word "player".
Providing alternate feedback	Tim: It is not appropriate at all. I looked it up in the dictionary, and it shows that "competitor" is more suitable.
Clarifying/formulating response	John: Is "player" inappropriate? Tim: It is fine, but it seems that the word "competitor" is more correct than "player"
Proposing alternatives	Amy: Then, shall we start writing our summary? We could first discuss how to integrate the content.
Providing solution direction	Tim: We can write down the main idea, followed by providing examples.
Providing concrete example	John: We can connect the sentence with a sequence marker like "First," "Second," and "Finally." By doing so, we can clarify each statement.

Once the students finished their writing, they collaboratively edited the reaction essays. In editing the reaction essays, the collaborative dialogues not only allowed students to expand their knowledge of grammar and vocabulary, but also exerted collaborative efforts to correct incorrect grammatical sentences and revise semantically incorrect sentences. As shown in Table 7, Tim found a grammatical error in the

sentence “*With these rules, everyone has to follow it*” written by Amy. Then, Tim negotiated with Amy about the grammatical use of pronouns – *them*. Through the collaborative dialogues with Tim, Amy reconstructed her understanding of the pronoun *them*. They thus expanded their grammatical knowledge through collaborative dialogues. Another example is how they negotiated meanings with each other to edit an appropriate phrase that reflected their intended meaning. Through collaborative dialogues, they changed the word “solemn” into “take more care at the game.” They explored the possibilities for using different words or phrases to express their meanings.

Table 7. Examples of how the collaborative dialogues facilitate the HCD group to edit a reaction essay

Original writing texts	Collaborative dialogues	Revised writing texts	Analysis of collaborative dialogues
With these rules, everyone has to follow it.	<p>Tim: “Rules” is the plural form, isn’t it? We should use “it”, rather than “them”</p> <p>Amy: But, “them” only represents humans, doesn’t it?</p> <p>Tim: “Them” also can stand for the “object”.</p> <p>Amy: Well...Let’s revise it.</p>	With these rules, everyone has to follow <u>them</u> .	Expanding grammatical knowledge about pronouns
Because it can let player more solemn.	<p>Tim: I think it is not appropriate to put the word “solemn” here.</p> <p>John: solemn...means take something seriously?</p> <p>Tim: Right, any other word that we can alter?</p> <p>John: How about substituting the “solemn” with “care”</p> <p>Tim: I think it is somehow weird. Let me think twice.</p> <p>John: How about revising it to be “take care at the game”?</p> <p>Tim: Fine.</p> <p>John: Ok, I revise it.</p>	Because it can let player <u>take more care at the game</u> .	Expanding knowledge about vocabulary and phrases

CONCLUSIONS

When engaged in collaborative dialogue in SCW, students are exposed to bountiful linguistic sources of exposure to language input and output which in turn contribute to L2 writing development. Students can exchange their understanding and knowledge about vocabulary, sentence structures, and idea organization to collaboratively produce written texts. The findings suggest that highly collaborative groups can produce high quality reaction essays in terms of fluency and accuracy. It was suggested that students should be provided with more opportunities to exchange information or ideas during the entire writing stages, including generating ideas, writing reaction essays, and editing. The findings responded to previous research, in that students benefitted from text-based synchronous communications, realized their linguistic misconceptions, and received immediate feedback to help resolve their writing problems (Lee, 2002; Webb, 1989). The results also showed that students often centered collaborative dialogues on how to write the essays more than how to generate ideas and edit the texts to complete reaction essays. Such findings echo some previous studies, in that students participating in the entire SCW process often placed more emphasis on the meaning negotiation of the content than on the language forms (Kessler, 2009).

In the social interaction process, collaborative dialogues provide an avenue for students to use language and reflect on their language use. Collaborative dialogues can be regarded as a form of mediation for facilitating L2 writing, particularly when students work together with peers to co-construct a written document. Collaborative dialogues often occur when students notice linguistic problems and work together to solve them, leading to L2 knowledge construction. As a result, Swain (2000) specially referred this concept to “dialogues with which speakers are engaged in problem solving and knowledge building, and dialogues heighten the potential for exploration of the product” (p. 102). In other words, through collaborative dialogues, students can construct new or half-developed ideas, since students in a group collaboratively generate and refine the ideas. Students may elicit challenging questions and provide constructive feedback to promote knowledge development. The feedback in turn often motivates students to monitor and evaluate their learning processes. Through monitoring and evaluating in the social interaction process, students can obtain a broader scope of their own problems to adjust their writing.

Using EP, teachers could save different versions of students’ written documents, and then use the *Time Slider* feature, to monitor students’ writing processes and examine students’ developmental processes of text quality. Moreover, EP also historically recorded all the transcripts of students’ collaborative dialogues in the chat room. By observing the transcripts of students’ collaborative dialogues, teachers can understand how students develop writing products, negotiate meanings, and resolve any misunderstandings with peers during the SCW process.

While this research contributed to the effectiveness of SCW in EFL students’ writing products, limitations remain. Because this research was conducted in an EFL context to investigate the effects of SCW and collaborative dialogues on writing, the results might not be generalized for other English teaching contexts, such as ESL. In addition, the research is limited in its one-semester implementation timeline. Longitudinal studies could be conducted to investigate whether time is a key factor for successful SCW.

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ABOUT THE AUTHOR

Hui-chin Yeh is currently an associate professor in the Graduate School of Applied Foreign Languages at National Yunlin University of Science and Technology in Taiwan. She received her Ph.D. in Language Education at Indiana University-Bloomington. Her research interests center on EFL teacher education, computer-assisted language learning, and EFL reading and writing. She has published many articles on these topics in *Language Learning & Technology*, *Computer Assisted Language Learning*, *Teaching and Teacher Education*, *British Journal of Educational Technology*, *Educational Technology Research & Development*, *ReCALL*, *Educational Technology & Society*, *Australasian Journal of Educational Technology*, *Asia-Pacific Education Researcher*, and *Asia Pacific Education Review*. She has received several awards for her work, among them a distinguished young researcher award from the Ministry of Science and Technology, a 2010 teaching excellence award, and a 2011 excellence in mentoring award. Her “Multimedia English” course has been certified as a quality e-learning course from the Ministry of Education in Taiwan. She hopes that her efforts in different aspects of her work can make significant contributions to her academic field of study.

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