

Collaborative to Individual Writing: An Investigation of Student Performance and Perceptions*

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This study investigates how English as a foreign language (EFL) learners progress from collaborative writing to individual writing in terms of accuracy, complexity, and fluency. Previous research on collaborative writing has focused on comparisons between learners who worked in pairs or groups with learners who worked individually. However, no research to date has explored the same learners' experiences of collaborative and individual writing and their written products. In order to better understand the effects of this phenomenon, the current study compares the collaborative and individual written texts of 15 Korean EFL learners and, focusing on four students, also explores how learners' perceptions and attitudes towards collaborative writing affect their actual writing. The analysis reveals that, in overall, learners' writing improved through the experiences of collaborative writing. Also, students who produced higher quality individual works than collaborative had more positive views on collaborative writing than those who produced lower quality writing individually. The results of this study imply that collaborative writing can be beneficial in second language contexts and that instructors should inform students of its benefits to ensure students take advantage of the collaborative writing experience.

[collaborative writing/individual writing/협업작문/개인작문]

I. INTRODUCTION

The benefits of collaborative work in the classroom, such as pair work, group work, or peer review, have led to their incorporation in second language writing classrooms. One of the most often cited benefits of collaborative work is that it allows students to become

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socialized into workplace practices, in which many tasks are performed collaboratively (Strauss, 2001). Collaborative work also serves the sociocultural purpose of promoting learners' cognitive development through social interaction. That is, with the help of their peers, learners succeed in performing tasks that they are unable to do alone (Donato, 1994, 2004; Swain, 2000). While collaborative work in the form of peer review and peer interaction has often been studied (Anton & DiCamilla, 1998; DiCamilla & Anton, 1997; Ohta, 2000), collaborative writing, in which students work together to compose one text, has rarely been studied. Studies that do exist tend to compare two different groups of students—one group that worked individually and one group that worked collectively—in order to understand which approach is more successful in helping student writing (Storch, 2005; Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009). However, no studies to date have compared how the same group of students progress as writers from the experience of collaborative writing to individual writing. Therefore, in addition to comparing the collaborative writing and individual writing of Korean learners of English, this study explores how their reflections and perceptions on collaborative writing affect writing.

II. LITERATURE REVIEW

1. Benefits of Collaborative Work

Collaborative work, such as pair and small group work, is often used in second language writing classrooms due to their perceived benefits, even though these tasks are not always perceived positively by second language learners (Leki, 2001). From a psycholinguistic perspective, learners should notice gaps between their current level of proficiency and the target language (Ellis, 1994; Long, 1983, 1996; Schmidt, 1990, 1994) in order to acquire language features. It is theorized that collaborative work helps learners notice the difference between their interlanguage and the target forms and provide them better chances of acquiring these target forms. Vygotsky's sociocultural perspective, which is based on the key role of social interaction in learning, posits that collaborative work is necessary to help individuals accomplish tasks in their zones of proximal development (ZPD). According to Vygotsky (1978), from the very beginning of life, learners need assistance attuned to their individual needs from more able learners, which is often called "scaffolding." Many second language scholars have found that scaffolding occurs in peer interaction as well (Donato, 1994; Ohta, 1995, 2000; Swain & Lapkin, 1998). Storch (2002) discovered different patterns in peer interaction, depending on how equal peers are in ability and how mutual their interaction is. Comparing four different patterns of

interaction—collaborative, expert/novice, dominant/dominant, and dominant/passive—Storch found that scaffolding is more likely to occur when pairs interact either collaboratively or as expert/novice compared with dominant/dominant or dominant/passive. She noted that knowledge transfer occurs more in the former two patterns than in the latter two.

2. Collaborative Work vs. Individual Work

Several studies conducted within the sociocultural framework have shown that collaborative work helps accomplish tasks more accurately (Dobao, 2012; Y. Kim, 2008; Kuiken & Vedder, 2002; Nassaji & Tian, 2010; Storch, 2002). Nassaji and Tian (2010) compared pairs and individuals in two different tasks, a reconstruction cloze task and a reconstruction editing task, and found that pairs were more accurate in task completion, although they did not gain greater knowledge of vocabulary than individuals. Kuiken and Vedder (2002) and Y. Kim (2008) found similarly positive effects of collaborative work, though less definite than those found by Nassaji and Tian. Kuiken and Vedder (2002) compared a control group in which some high school students worked individually and an experimental group in which other high school students worked in groups in the acquisition of the passive form. Although these two groups did not show any significant difference in test results, the result of a qualitative analysis reveals that the experimental group was more aware of the language form. Y. Kim (2008) examined collaborative dialogue and think-aloud protocols of pair and groups of Korean as a foreign language learners in pretest, dictogloss task, and posttest. Whereas both groups engaged in a similar number of Language-Related Episodes (LREs)—specific discussions about language—pairs performed significantly better on vocabulary tests than individuals due to their ability to dialogue. In a comparison of individuals, pairs, and groups, Dobao (2012) found similar advantages for groups of four learners over both individuals and pairs. After asking all three types to tell a story based on pictures, Dobao found that the groups produced more LREs and produced more accurate texts than pairs or individuals.

While these studies reveal the positive effects of collaborative works on specific classroom tasks, some scholars have shown the advantages of collaborative work over individual work, specifically in written products themselves (Storch, 2005; Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009). In particular, collaborative writing seems to improve grammatical accuracy in student writing. After comparing nine pairs and five individual learners, Storch (2005) found that the pairs produced shorter but more accurate and complex texts than individuals. Based on these results, she concludes that “collaborative writing also afforded students the opportunity to give and receive immediate feedback on language, an opportunity missing when students write individually” (p. 168).

Storch and Wigglesworth (2007) compared report and argumentative essays of 24 pairs (48 students) and 24 individuals. The comparison reveals that the pairs produced more accurate text than the individuals, which resulted from more opportunities for students in pairs to provide immediate language feedback. Wigglesworth and Storch (2009) found similar positive results of collaborative writing on student accuracy. The comparison of 96 argumentative essays composed by 48 pairs and 48 individuals revealed that collaborative writing improves accuracy in addition to helping generate ideas about essay content.

These studies have all taken a comparative approach to assess whether collaborative writing or individual writing results in more discussion about language or greater grammatical accuracy. However, no studies have examined how individual learners progress as writers through experiences of first collaborative writing and then individual writing. To this end, the present study examines both the group and individual work of 15 Korean EFL learners in a writing class. This study also explores participant perceptions of collaborative writing and how these experiences and perceptions make a difference in their writing. More specifically, the following questions are addressed in this study:

1. How do learners progress from collaborative writing to individual writing in terms of accuracy, complexity, and fluency?
2. What are learners' opinions of collaborative writing?
3. How do learners' reflections on their experiences of collaborative writing affect their individual writing?

III. METHODOLOGY

1. Participants

The participants are 15 of 24 second-year university students enrolled in a required college English composition class I taught in Fall 2011. Nine students were excluded due to incomplete data. All the participants finished one-year College English Conversation program as a pre-requisite to this composition class and were expected to arrive to the class with the proficiency of about 650 in TOEIC scores on average. The English composition course is designed to teach students the basics of academic reading and writing, and students are guided from paragraph writing to essay writing through the semester.

On the first day of class, participants were given an in-class diagnostic test asking them to write an expository essay on the topic "the best restaurant near campus." Throughout the semester, the students completed three required writing assignments outside of class: an example paragraph, a process paragraph, and an argumentative essay. The first two were

team tasks, while the last one was an individual task. Participants worked with different members on the example and process paragraphs so they could have a chance to work with different classmates; however, in a few cases, students worked with the same group members because of the instructor's desire to assign at least one more advanced writer to each group. The transition from collaborative work to individual writing was adopted based on the sociocultural assumption that students would assist in each in learning the basics of academic writing and would then internalize what they had learned through group work and write more consciously on their own. For each of the writing assignments, the participants were to write two drafts: a first draft and a second (final) draft. Between drafts, they received feedback from their peers and the instructor and were to revise their first draft and submit the second draft. The instructor met with the groups for the first two paragraphs and with each student individually for the last one to give feedback and also conducted a ten-minute exit interview about the experiences of collaborative writing with each of the participants at the end of the semester (see Appendix 1 for questions).

2. Data Analysis

This study adopts a mix-method approach: quantitative analysis of students' written texts along with qualitative analysis of their reflections on the experiences of collaborative writing. First, students' written texts were analyzed in order to examine their progress from collaborative writing to individual writing. Second, interview data were collected and transcribed to see how students' experiences of collaborative writing are reflected in their written texts. Data included participants' diagnostic test, final drafts of the example paragraph, final drafts of the process paragraph, final drafts of the argumentative essay, and their ten-minute interviews¹.

1) Analysis of Drafts

All the drafts were analyzed quantitatively in terms of accuracy, complexity, and fluency. First, accuracy was measured by the proportion of error-free clauses of all clauses (EFC/C), drawing on Storch (2005) and Storch and Wigglesworth (2007). According to Storch (2005), accuracy is often measured either in EFC/C or in error-free T-units of all T-units. In this study, EFC/C was adopted, as participants were lower level students whose writing often exhibited no error-free T-units. In the unit of EFC/C, a clause is defined as either

¹ Interviews were audio-recorded under the condition they were used anonymously. The names used in this study are all pseudonyms. The interview was originally conducted in Korean and later translated into English.

independent or dependent. Storch (2005) defines an independent clause as “a grammatical structure which contains a subject and a verb and can stand on its own” and a dependent clause as “a clause which contains a finite or a non-finite verb and at least one additional clause element of the following: subject, object, complement or adverbial” (p. 171). Errors in this study are defined as “syntactical errors (e.g., errors in word order, missing elements), morphology (e.g., verb tense, subject-verb agreement, errors in articles and prepositions, errors in word forms)” (Wigglesworth and Storch, 2009, p. 464). Also, as in their study, errors in lexis (word choice) as well as errors in spelling and punctuation were excluded unless they obscured the meaning (see Appendix 2 for details). All errors were identified by two native speakers of English. Whenever a discrepancy occurred, the stricter view of indentifying errors was adopted.

Second, complexity was measured by the proportion of clauses to T-units. A T-unit is defined as “an independent clause and all its attached or embedded dependent clauses” (Storch, 2005, p. 171). Run-on sentences were counted as 2 T-units, while sentence fragments were counted as one T-unit. Storch (2005) and Wigglesworth and Storch (2009), quoting Foster and Skehan (1996), state that this measure is reliable and correlates well with other complexity measures.

Finally, the number of clauses was used to measure fluency. Number of clauses or number of T-units are often used as fluency measures (Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009), but the number of clauses is taken in this study for the same reason stated in the explanation of the accuracy measure; as the texts of the participants do not show variation in the number of T-units, the measure of counting the number of clauses was adopted. Table 1 summarizes the measures of accuracy, complexity, and fluency used in this study to analyze student texts.

TABLE 1
Measures Used in Analysis of Student Texts

Accuracy		Complexity	Fluency
Proportion of clauses of all clauses	Error-free	Percentage of clauses per T-unit	Number of clauses per text

2) Analysis of the Interview

The audio-recorded interview data was first transcribed line by line and later coded by three different themes: views on collaborative writing, helpful aspects of collaborative writing, and the format of collaborative writing. Through the comparison between each participant’s reflections on the experiences of collaborative writing and the analysis of his/her texts, four participants—Jun-ho, Min-hee, So-hee, and Dong-wook—arose as key

cases; the first three produced better texts individually in the three areas of accuracy, complexity, and fluency than when they worked with their group members, while Dongwook's final individual writing showed lower scores than his collaborative works in all three areas. An in-depth analysis of the texts and interview data was conducted on the four focal students, whose views on collaborative writing were remarkably different.

IV. RESULTS

1. Text Analysis

The analysis of student texts reveals that overall, the participants' final individual writing improved in comparison with their diagnostic writing assignment, as seen in Table 2.

TABLE 2
Means for Diagnostic and Final Writing Assignment

	Accuracy	Complexity	Fluency
Diagnostic	16.97	150.00	30.20
Final	28.08	178.18	41.80

A repeated t-test was conducted to see whether the two written texts differed from each other in terms of accuracy, complexity, and fluency. The results indicate that the participants did significantly better in their final writing assignment than in their diagnostic test in all three areas—accuracy ($t = -3.106$, $df=14$, $p < .05$), complexity, ($t = -3.193$, $df=14$, $p < .05$), and fluency ($t = -4.187$, $df=14$, $p < .05$).

In comparing the two individual writing scores—the diagnostic test and the final writing assignment—with the mean score of their collaborative works, it is quite apparent that in the first individual writing, most participants did not write as well as their collaborative writing. Table 3 summarizes the comparison between the first individual writing and the average score of the two collaborative assignments.

TABLE 3
Difference between 1st Individual Writing and Collaborative Writing

Student	Individual (I) Collaborative (C)	Accuracy	Complexity	Fluency
Jun-ho	I	14.29	147.62	31.00

	C	23.12	163.58	35.25
Jae-min	I	18.18	131.82	29.00
	C	28.12	154.34	40.00
Jun-chul	I	0.00	158.82	27.00
	C	29.22	181.29	33.25
Min-gi	I	32.00	144.00	36.00
	C	33.17	174.60	43.75
Sang-hun	I	25.00	158.33	19.00
	C	31.96	200.60	39.00
Jung-min	I	0.00	178.57	25.00
	C	36.67	167.45	36.75
Dong-wook	I	17.65	141.18	24.00
	C	28.36	165.57	36.75
Min-hee	I	26.32	168.42	32.00
	C	28.97	198.02	34.75
Su-min	I	35.29	158.82	27.00
	C	30.20	206.90	58.00
So-hee	I	28.57	128.57	27.00
	C	28.12	154.34	40.00
Yun-ho	I	6.25	181.25	29.00
	C	23.07	164.73	37.00
Woo-jae	I	17.39	139.13	32.00
	C	30.39	188.68	29.75
Sung-ho	I	4.76	147.62	31.00
	C	30.68	170.72	38.50
Chang-su	I	13.51	135.14	50.00
	C	22.65	185.66	61.25
Hyo-jong	I	15.38	130.77	34.00
	C	34.61	182.52	49.00

As can be seen, Jung-min and Yun-ho received higher points in complexity in their diagnostic test than in their collaborative writing, while Su-min and So-hee scored higher individually in terms of accuracy than in their collaborative writing. It seems that these four had already arrived to class with a certain level of accuracy and complexity. However, most of the participants seemed to perform better in collaborative writing than in individual writing, in spite of the differences in types and lengths of writing assignments.

The comparison between collaborative writing and participants' final individual writing uncovers quite a different story. Table 4 shows a summary of the comparison.

TABLE 4
Difference between Final Individual Writing and Collaborative Writing

Student	Individual (I) Collaborative (C)	Accuracy	Complexity	Fluency 2
Jun-ho	I	28.57	171.43	48.00
	C	23.12	163.58	35.25
Jae-min	I	27.78	200.00	36.00
	C	28.12	154.34	40.00
Jun-chul	I	29.41	170.59	29.00
	C	29.22	181.29	33.25
Min-gi	I	21.74	204.35	47.00
	C	33.17	174.60	43.75
Sang-hun	I	53.57	146.43	41.00
	C	31.96	200.60	39.00
Jung-min	I	15.15	193.94	64.00
	C	36.67	167.45	36.75
Dong-wook	I	15.00	130.00	26.00
	C	28.36	165.57	36.75
Min-hee	I	47.06	229.41	39.00
	C	28.97	198.02	34.75
Su-min	I	22.22	196.30	53.00
	C	30.20	206.90	58.00
So-hee	I	42.11	226.32	43.00
	C	28.12	154.34	40.00

Yun-ho	I	20.00	193.33	29.00
	C	23.07	164.73	37.00
Woo-jae	I	40.00	123.33	37.00
	C	30.39	188.68	29.75
Sung-ho	I	21.74	160.87	37.00
	C	30.68	170.72	38.50
Chang-su	I	31.82	136.36	60.00
	C	22.65	185.66	61.25
Hyo-jong	I	5.00	190.00	38.00
	C	34.61	182.52	49.00

While some participants produced a better individual text in one, two, or all three measures, a few participants show no progress in any of the areas in their final individual writing assignment. For instance, while Jun-ho, Min-hee, and So-hee received higher scores in their final individual writing assignment in all three measures, Su-min, Sung-ho, and Dong-wook received lower scores in their final individual writing assignments. Su-min and Sung-ho received lower than average scores in accuracy on their collaborative writings, but close to the average in complexity and fluency. Compared with his initial score (4.76 in accuracy) in the diagnostic, Sung-ho improved greatly in terms of accuracy (21.74), after the experience of working on texts collaboratively. Interestingly, Su-min received high scores in the diagnostic (35.29 in accuracy) than in the final individual writing assignment (22.22 in accuracy). In comparison, Dong-wook received a much lower score in the final individual writing than in his collaborative writing. Moreover, these scores are even lower than those of his diagnostic both in accuracy and complexity—the initial scores are 17.65 and 141.18, but the final scores are 15.00 and 130.00.

2. In-depth Analysis of Four Students

In order to more deeply understand these differences in their written texts, I explore participant attitudes toward the experience of collaborative writing, focusing in particular on the four focal participants—Jun-ho, Min-hee, So-hee, and Dong-wook. The three measures of student written texts have already shown quite a contrast between Dong-wook and the other three. As mentioned previously, whereas Jun-ho, Min-hee, and So-hee received higher scores in accuracy, complexity, and fluency on their final writing assignments compared to the averages of their collaborative writings, Dong-wook

received much lower scores in all three areas. The exit interviews revealed that each student had a very different attitude and perception of their collaborative writing experiences during the semester. Jun-ho, Min-hee, and So-hee had relatively more positive attitudes in comparison with the other participants, and Dong-wook thought he did not improve at all through the experience of collaborative writing.

1) Jun-ho, Min-hee, and So-hee

When asked whether the experience of collaborative writing was helpful to them, Jun-ho, Min-hee, and So-hee answered as follows:

Yes, [collaborative writing] helped me a lot. It made me practice aspects of writing that I hadn't thought about, and made me express my ideas better in English. (Jun-ho)

I've received a lot of help while writing in a team, although I felt more comfortable writing alone. When I write alone, I often use the same and similar expressions. For example, if I use a relative pronoun, I often use it again and again. But when we work together, I can see how others write, we can check whether everything is correct together, and we can try different kinds of expressions. (Min-hee)

When I worked in a team, I often came to realize that it would sound better if I wrote like the other members suggested. Everybody had different ideas. So when someone suggested an idea, the other members accepted it. Sometimes I suggested my idea as well. When someone suggested a better expression, we accepted it. (So-hee)

Jun-ho, Min-hee, and So-hee all seem to acknowledge the advantages of collaborative writing in generating ideas and using appropriate expressions.

As for the first writing assignment, which was to write an example paragraph, Jun-ho worked with Min-hee and Sung-ho. The third group member, Sung-ho, also evaluated his collaborative writing experiences positively. This group reported having met twice face-to-face to discuss the topic, outline, and allocate a part to each member, and then, once the draft was ready, they met on-line to provide feedback to one another. After putting together the sentences, they edited together. The three members submitted an example paragraph about when a woman falls in love with a man, and it received 50.00 in accuracy, 134.62 in complexity, and 35.00 in fluency. These scores are higher in accuracy and fluency than Jun-ho's original scores in the diagnostic test (14.29 and 31.00), but lower than his original complexity score (147.77).

For the second collaborative writing, Jun-ho worked with group members whose

interview data could not be obtained, and thus were excluded from this study. His second collaborative writing assignment measured 18.18 in accuracy, 130.30 in complexity, and 43.00 in fluency. In this assignment, Jun-ho received a lower score than in his first collaborative assignment, and very similar results to those of his diagnostic test. In fact, these scores are the lowest of all the collaborative writing assignments scored. In comparison with the other groups, Jun-ho's group wrote a relatively shorter first draft, which contained only 24 clauses. While their second draft was lengthier (43 clauses), they made many errors (only 12 error-free clauses). After these experiences of collaborative writing, Jun-ho wrote an argumentative essay arguing that teenagers should not be singers in Korea for several reasons. This piece of writing was measured as much more accurate, complex, and fluent (28.57, 171.43, and 48.00) than his diagnostic writing (14.29, 147.62, and 31.00).

Similar progress occurred in the cases of Min-hee and So-hee. As already mentioned, Min-hee worked with Jun-ho for her first collaborative work, and received 50.00 in accuracy, 134.62 in complexity, and 35.00 in fluency, which are higher than her diagnostic writing (26.32 in accuracy and 32.00 in fluency), but lower than her initial score in complexity (168.42). In her second collaborative writing, Min-hee worked with Jun-chul and Woo-jae. Jun-chul and Woo-jae had quite critical attitudes towards collaborative writing. Jun-chul evaluated his first collaborative work as quite positive because he said he worked with Min-gi, one of his friends, but considered the second collaborative work with Min-hee and Woo-jae as not successful because he could not communicate well with them. Similarly, Woo-jae said, "all three members had different opinions, and also it was difficult to find a time in common for everyone to meet....it is true of any kind of team project. All of us have very limited ability in English. One person said this, and the other person said something else. Then it was difficult to decide on which one to accept." Although Min-hee worked with students who had somewhat negative evaluations on collaborative writing, their collaborative work received 31.58 in accuracy, 194.74 in complexity, and 37.00 in fluency, all of which are higher than those of her first diagnostic writing.

So-hee made similar progress to Min-hee through collaborative writing. She worked with Jae-min and Chang-su for the first collaborative work, and with Yun-ho and Jae-min the second time. Unlike the case of Jun-ho, who worked with group members who had positive attitudes toward collaborative writing, So-hee worked with members whose perceptions are quite negative regarding collaborative writing. For instance, Jae-min said, "I felt limitations [in team work] because all of us have limited ability in English. We did not attempt to make many changes. We only corrected what was pointed out by the instructor." Yun-ho was also quite pessimistic about the effects of collaborative writing:

I prefer to work alone. I don't want to disparage the other members, but I often came

across sentences that did not make sense in the context. So I edited the whole text alone and re-posted it on the website.

Despite the negative attitudes toward collaborative writing of her group members, So-hee evaluated her experiences of collaborative writing positively, as mentioned above. Her first group assignment received 24.39, 129.27, and 53, and her second group writing received 42.86, 171.43, and 36.00. Each measure of her last writing assignment (42.11, 226.32, and 43.00) is not only much higher than those of her diagnostic test (28.57, 128.57, and 27.00), but also higher than the average of her collaborative works (28.12, 154.34, 40.00). Her complexity indicator is the second highest of all the participants.

2) Dong-wook

Dong-wook is in stark contrast with Jun-ho, Min-hee, and So-hee in terms of attitudes and perceptions of collaborative writing. When asked whether collaborative writing was helpful, Dong-wook replied:

I felt like I wished I was writing alone. In group work, the work is divided. If you keep working in a group, you know the ability, in writing ability, there is no progress when working in a group. I am not sure what kind of benefits teamwork has. I am not sure of the effects of teamwork, either.

Although he said he was not sure of the effects of collaborative writing, Dong-wook's reflections on his collaborative experiences show that he benefitted.

We often worked on Nate-on. First we decided on a topic and then wrote about it. It is quite natural that we often made mistakes. When one member found a mistake, we corrected it among ourselves.

The analysis of his written texts also verifies progress in the three areas of accuracy, complexity, and fluency. In his first collaborative writing, Dong-wook worked with Yun-ho, who had negative views on the experiences of collaborative writing, as seen above. Their assignment received 12.50 in accuracy, 162.50 in complexity, and 39.00 in fluency, which are higher in complexity and fluency than Dong-wook's initial scores (141.18 in complexity, and 24.00 in fluency), but lower in accuracy (17.65). In the second writing assignment, Dong-wook worked with Sang-hun, who interestingly found the second collaborative writing with Dong-wook more helpful than his first experience.

The first collaborative work was so-so, but the second one seemed to work better. In the first one, we did not know well what to do, so we only divided the jobs. And that was it. But in the second one, after finishing our part, we reviewed the work all together....we corrected each other's mistakes.

Dong-wook and Sang-hun's second collaborative writing received 47.62 in accuracy, 171.43 in complexity, and 36 in fluency, which are higher than those of Dong-wook's diagnostic writing and, except for fluency (39.00), of his first collaborative work. Despite this progress from his diagnostic to his collaborative writing, Dong-wook was not sure of the effects of collaborative writing and wished that he had been able to work individually. In the final individual writing assignment, Dong-wook received much lower scores—15.00 in accuracy, 130.00 in complexity, and 26.00 in fluency—than in the collaborative works (28.36, 165.57, and 36.75), and even lower than in his first writing assignment in accuracy and complexity (17.65 and 141.18). It is quite explicit that collaborative works benefited Dong-wook despite his negative evaluation on them, but it seems that these negative views prohibited Dong-wook from obtaining chances to learn through the experiences of working with other students.

V. CONCLUSION

The analysis of student texts reveals that all participants' collaborative writing scores were higher in accuracy, complexity and fluency than their first individual writing, the diagnostic test. Of course, this improvement can possibly have been made through repeated practice of writing, but it also confirms previous research that has compared individual writing with pair or group work (Dobao, 2012; Storch, 2005; Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009). Moreover, the measures of accuracy, complexity, and fluency indicate that the participants wrote significantly better texts in their final individual writing than in their diagnostic writing. This result is quite meaningful because their final project—writing an argumentative essay—was more challenging both in task type and length than their first individual writing, of which the topic was informal and casual.

Despite the overall improvement through the experience of collaborative writing, the comparison of each individual student's collaborative writing with their final individual writing shows wide variation. While some participants outperformed their collaborative writings in terms of accuracy, complexity, and fluency in their individual writing assignments, three students received lower scores, and even one of them, Dong-wook, submitted a text that received a lower score than even his first individual writing. The in-

depth analysis of the four student interviews and their written texts shows that the students who improved had quite positive views and attitudes towards their experiences of collaborative writing prior to the final assignment. However, Dong-wook did not believe he improved through the collaborative writing, even though he actually produced a better text with his group members than when he worked alone. His evaluation was in drastic contrast with one of his group members, who evaluated the collaborative work with Dong-wook as quite helpful.

These findings imply that the experiences of collaborative writing help learners to write on their own, particularly when they have positive views and attitudes towards working collaboratively. A positive attitude seems to increase the probability that they gain knowledge in accuracy, complexity, and fluency. Thus, it is important that writing teachers inform their students of the benefits collaborative writing may have on their individual writing and help them to be more open-minded about the experiences of collaborative writing. As this study shows, learners who are more positive about the experiences of collaborative writing are more likely to learn through the task and to incorporate what they have learned from collaborative writing into their individual writing.

Further studies are needed to understand how learners interact with group members while doing collaborative writing. Because all assignments, except for the diagnostic, were completed outside the classroom, this study resorted to participants' explanations to obtain information of how the group members worked together. However, studies that collect interactive data of how the writers interact with group members as well as how they write individually will unveil which types of collaborative work and learner groups contribute most to the improvement of student writing. Along with efforts to determine the most effective way to group students and work with group members in a writing classroom, efforts should also be made to instruct learners about the purpose and benefits of collaborative writing. As this study implies, when learners shut their minds to the benefits of collaborative work, they will neither learn from others nor achieve any improvement in their own act of writing, no matter how beneficial the collaborative work may be.

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APPENDIX 1

Interview Protocol

1. How were your collaborative writing experiences? Were they helpful to you?
2. If so, in what way was collaborative writing helpful? If not, why do you think it was not helpful?
3. How did you and your members work on the draft together? Did you meet face to face and work together with the group members or meet on the cyber space? Which do you prefer and why?
4. You have worked with two different groups of students. Have you worked in the same format? How did the two team projects work?

APPENDIX 2

Measures of Analyzing the Student Text

(Adopted from Storch (2005) and Storch and Wigglesworth (2007))

1. Measures of Accuracy

Proportion of Error-free clauses of all clauses: Proportion of clauses that do not contain any error in syntax and morphology (excluding the errors in lexis, spelling, and punctuation) of all the clauses in a text. A clause means an independent clause (a grammatical structure which contains a subject and a verb and can stand on its own) or a dependent clause (a clause which contains a finite or a non-finite verb and at least one additional clause element of the following: subject, object, complement or adverbial).

2. Measures of Complexity

Percentage of clauses per T-unit: The number of clauses is divided by the number of T-units in a text. A T-unit means an independent clause and all its attached or embedded dependent clauses. Run-on sentences are counted as 2 T-units while sentence fragment is counted a one T-unit.

3. Measures of Fluency

Number of clauses: The total number of clauses is calculated.

Examples in: English

Applicable languages: English

Applicable levels: Secondary/Tertiary

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