

THE EFFECTS OF COLLABORATIVE WRITING ACTIVITY USING GOOGLE DOCS ON STUDENTS' WRITING ABILITIES

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ABSTRACT

Google Docs, a free web-based version of Microsoft Word, offers collaborative features which can be used to facilitate collaborative writing in a foreign language classroom. The current study compared writing abilities of students who collaborated on writing assignments using Google Docs with those working in groups in a face-to-face classroom. The experimental research was conducted with students enrolled in EN 012 course in the first semester of academic year of 2013. Both groups were assigned to complete four writing assignments using different working methods: one group worked together outside class with Google Docs, while the other worked together in class. The instruments employed in the study were writing tests and two questionnaires. Data were analyzed by using means, standard deviations, percentages, and independent samples *t*-tests. The results indicate that a significant difference was found between the two groups' writing mean score after the experiment. Students in the Google Docs group gained higher mean scores than those working in groups in a face-to-face classroom. In addition, students reported that they had positive attitudes toward collaborative writing activity and high collaboration in their groups using Google Docs, while nearly all of them perceived that this learning tool is easy to use.

Keywords: Web 2.0, online collaboration, Google Docs, writing abilities, collaborative writing

INTRODUCTION

Learning in collaborative setting is a social interaction involving a community of learners and teachers, where members acquire and share experience or knowledge. Collaborative learning is, therefore, a significant factor in students' learning because it promotes active learning and student-reliance in classrooms (Foote, 2009). Learning is shifting from passive reception to active creation. Students tend to take more ownership of their material and to think critically about related issues when they work as a team. The collaboration process enhances students' learning and develops their social skills like decision-making, conflict management, and communication (Smith & MacGregor, 2009). According to Banerjee (2000), in the collaborative learning process, a student must formulate ideas about the material assigned to him, test his assumptions, clarify them, come to a conclusion and then assimilate that material within himself. Once he feels that he "owns" the material, he must explain it to his group so that his knowledge can be pooled together and shared among all his group members. Each student, thus, is a dynamic contributor to both the learning and the teaching process. When questions are raised, different students will have a variety of responses. Each of them can help the group create a product that reflects a wide range of perspectives and is thus more complete and comprehensive (p.1).

Undergraduate students at Bangkok University, in the nine faculties: Humanities, Business Administration, Accounting, Communication Arts, Fine and Applied Arts, Sciences and Technology, Laws, Economics, and Engineering, are required to take at least three English courses. Each course consists of four skills: speaking, listening, reading, and writing. It is found that most students always get low scores in the writing assignments and tests. As mentioned earlier, among various teaching methods, collaboration among students is an interesting alternative in terms of creating helpful and active learning environments. Our Language Institute decided to implement collaborative learning in many language courses to improve students' writing skills. In a collaborative learning environment, students help one another to compose a writing task. They can learn from each other through the editing process until they get the final product. In terms of learning motivation, students who work in collaborative groups appeared to be satisfied with their classes, and their learning motivation improved respectively (Kowal & Swain, 1994; Swain & Lapkin, 1998).

Nevertheless, there is a limitation of collaboration in classrooms. Students may not have much time to read and build on each other's work; however, in collaborative online environments, they are given this opportunity (Hewitt & Scardamalia, 1998). Having students working together is not restricted to in-class communication. Online collaborative writing improved fluency and accuracy (Elola & Oskoz, 2010) and valued the opportunity to share feedback with peers (Ware & O'Dowd, 2008). According to Black (2005), on-line discussions have the potential to motivate student inquiry and create a context in which collaborative learning occurs, promoting both

reflection and critical thinking. Many studies employed tools in a Computer Mediated Communication (CMC) environment such as discussion board, wiki, and blog to increase students' interaction and facilitate the peer feedback process. In online learning communities, students can create, share information, practice critical reflection, negotiate meaning, test synthesis, and build consensus as much as they wish. Through online, collaborative written assignments, group discussions, debates and critiques of arguments, students can enhance knowledge construction (Zhu, 2012). Research has shown that the use of constructive feedback can enhance the quality of student discussion responses (Ertmer & Stepich, 2004; Ciftci & Kocoglu, 2012). The use of peer feedback in a web-based learning environment provides a number of advantages such as increasing the timeliness of feedback, offering new learning opportunities for both givers and receivers of feedback, humanizing the environment, and building community through online interaction (Corgan, Hammer, Margolies, & Crossley, 2004).

Among many technologies, Google Docs is a learning tool which helps to implement the learner-centered approach in a collaborative learning environment. According to Oxnevad (2013), document sharing and comments provide students with opportunities to receive immediate feedback. While working together, students generate online materials that reflect what they have learned and show connections between their prior knowledge, the course content, and their personal experiences. Since Google Docs is stored online, students can work at school and at home from any computer with an Internet connection, and they are more likely to revisit their work if they know someone else will be commenting on it. To insert a comment, students just highlight some text in the body of the document and the comment will appear on the right side of the page. Then they can click on any comment and watch the highlighted text in the document change color to quickly pinpoint the suggested revision. Comments are smart and they disappear after the issue has been addressed by the author so students feel a sense of accomplishment as they work their way through the suggestions of their peers. In addition, Google Docs provides support for collaboration in real time so students and teachers can have a virtual mini-conference about the work in front of them from any location if the timing is right.

The focus of this study is moved from individual learning to collective knowledge and from in-class assignments to web-based applications on out-of class assignments. Therefore, it aimed at examining undergraduate students' writing abilities as a result of using Google Docs for collaborative writing in a fundamental English course and investigated their attitudes towards collaborative writing activity using Google Docs. The result of this study will provide an insight into how technology can be used to support students' mutual learning and how much collaboration on written assignments in an online learning environment had on students' writing abilities. If Google Docs is effective in facilitating writing skills, it will be a new choice for language teachers who are facing time limit. This study was guided by three research questions:

1. Was there a difference in the students' writing abilities between those working in groups in a face-to-face classroom and those using Google Docs to work collaboratively out of class?
2. How did the students respond to collaborative writing activity using Google Docs?
3. How much cooperation did the students have in collaborative writing activity using Google Docs?

LITERATURE REVIEW

Collaborative Learning

Haring-Smith (1994, p. 360) defines collaborative writing as involving more than one person who contributes to the creation of a text so that "sharing responsibility" becomes essential. Collaborative learning takes on a variety of forms in an active process including the use of technology as a medium and tool. The concept of teaching writing skills is shifting, and teachers are faced with adapting their teaching practices to integrate new technologies while redefining writing and learning for the 21st century (Oxnevad, 2013). With the development and advancement of computer networks, online collaborative learning becomes possible even if students cannot meet in a classroom (Macdonald, 2006). In a writing classroom, collaborative writing can also be encouraged with the use of the World Wide Web. Many institutions have attempted to make use of technology in collaborative activities. Apart from blogs, wikis, chat rooms, forum, learning logs, Google Docs is an online suite of digital tools that provides teachers with some powerful features to help 21st century students develop writing skills.

Google Docs

The era of Web 2.0 application brings about many useful Internet services and programs such as blogs, wikis, and Google. For a decade, blogs are usually used to share information while wikis allows anyone to edit, modify, or delete content (Lamy & Hampel, 2007). Google Docs is another digital tool that includes the functions of blogs and wikis. Google Docs is "a free, web-based word processor, spreadsheet, presentation, form, and data storage service offered by Google" (Wikipedia, 2010). It allows users to create, edit and store their

documents online (Thompson, 2008). An extensive revision history is maintained. It is possible to view the entire document as it appeared at any time past. An author can choose to revert to an earlier version. Google Docs includes four major options: Google Documents, Google Spreadsheets, Google Presentations, and Google Drawing, which all share similar functions. There are also tools to compare any two versions of a document. This review focuses on Google Documents and how this application can facilitate students' collaborative writing in the English language classroom.

Since Google Docs is easy and fast, the tool is well-suited for facilitating digital writing workshops that combine peer editing with cooperative grouping and small group fine-tuned writing instruction. Sharp (2009) suggests that this collaborative editing tools allow a group of individuals to edit a document simultaneously while they can view the changes made by others in real time. This special feature makes Google Docs a powerful program that can facilitate collaborative writing in the language classroom. By sharing documents and keeping them online, students can access them anytime. Chinnery (2008) states that Google Docs is a productive tool where learning activities can be designed differently and creatively. For instance, an instructor might post a text, intentionally replete with errors, for learners to correct. Likewise, learners can easily peer-edit, as this program leaves an editing trail. Another option is chain storytelling, where an instructor begins a story which each learner contributes to in turn. Moreover, this tool is useful in group projects in general. Google Docs allows individuals to work on a common task without restrictions often imposed by traditional face-to-face contacts (Conner, 2008; Perron & Sellers, 2011).

Previous Research Studies

Many studies compared student learning between online technology group and face-to-face group in second/foreign language classes, and findings were different. A number of studies have found that the use of online technology in the classroom can facilitate collaborative learning among students and promote learning outcomes (Chen, 2008; Chou & Chen, 2008; Raman, Ryan, & Olfman, 2005; Vaughan, 2008). Other findings suggest that students perceived Google Docs as a useful tool for group work (Brodahl, Hadjerrouit, & Hansen, 2011; Zhou, Simpson, & Domizi, 2012). Students believed that a document that was written collaboratively might have higher quality than a document written alone (Blau & Caspi, 2008). However, online collaborations might also lead to unpleasant learning experiences. For example, students and instructors might feel uncomfortable in sharing knowledge (Rick & Guzdial, 2006). Students believed it was not appropriate to change other students' written products, and they may not all contribute equally to the assignment (Coyle, 2007).

RESEARCH METHODOLOGY

Participants and the Setting

The population in this research study was 5,625 students enrolled in EN 012 course of 3 credits in the first semester of 2013 academic year at a private university in Thailand. During the first semester, they were assigned to 123 sections by the Registration Office. As this study was conducted in a university setting, it was difficult for each subject to be randomly selected and assigned to the control and experimental groups. Therefore, it was more feasible to adopt the quasi-experimental design, which provides reasonable control over most sources of invalidity (McMillan & Schumacher, 1997). So, the samples included two sections, each of which contained 40 students, got from cluster sampling since students were already assigned to their sections. One section was used for the face-to-face group; another one for the Google Docs group. Both groups were taught by the researcher. This course aimed at enhancing students' skills in reading and writing logical responses to texts. The students met in class once a week – two periods (70 minutes per period). The length of the semester was 14 weeks.

Instruments

The impact on students' learning was evidenced by three instruments including writing tests, a questionnaire surveying attitudes toward collaborative writing activity using Google Docs and a questionnaire asking them to report how collaboratively they work. The first instrument was the writing tests administered to assess students' writing abilities in both groups. One writing test was given at the beginning of the term functioning as the pre-test and the second one as the post-test at the end of the term. They were paralleled tests. In each test, students were required to write two kinds of paragraph comprising 1) a cause to effect paragraph and 2) a process paragraph, each of which contained not fewer than 150 words. Although students were required to write the same types of paragraph, the writing topics provided in the pre-test were different from those in the post-test. Time allotted for each test was 100 minutes with the total score of 20 points. For the second instrument, to learn how well collaborative learning through Google Docs was accepted by the students, a questionnaire containing 10 items with a choice of five rating scale responses (1= strongly disagree, 2= disagree, 3 = neither agree nor disagree, 4= agree, and 5 = strongly agree) was created. Some statements in the questionnaire were taken from Lin & Jou's research (Lin & Jou, 2013). It was designed based on the theoretical framework of Vygotsky's social constructivism with his emphasis on the role of social interaction in learning and on the concepts

underlying the communicative approach in L2 learning (Vygotsky, 1978). The draft questionnaire items were checked for content validity by three experts in the English teaching field. The items with IOC index higher than 0.6 are acceptable. All of the items passed the criteria, and the overall index of the questionnaire was .87. Then the questionnaire was piloted with 30 non-subject students and calculated for proper reliability value by using Cronbach’s Coefficient Alpha. The reliability value was .85, implying that the questionnaire is reliable. The questionnaire was distributed to both groups after the posttest. In order to learn more about student working in groups, another questionnaire adapted from Zhou, Simpson, & Domizi (2012) was used to ask students to report about their collaboration, comprising three statements with five Likert-scale responses as follows:

- How collaborative was the group work? The replies were provided in five rating scales: 1= very low, 2=low, 3= moderate, 4= high, 5= very high.
- How would you evaluate your group performance? The replies were in five rating scales: 1= very bad, 2= bad, 3= moderate, 4= good, 5=very good.
- How difficult was this activity when it was done in groups using Google Docs? The replies were in five rating scales: 1= very difficult, 2= difficult, 3= neither difficult nor easy, 4= easy, 5= very easy.

Learning Procedure and Data Collection

This empirical study was carried out in two classes where different methods were employed for students’ writing development. One class worked together to complete writing assignments using Google Docs while the other worked together in groups in a face-to-face classroom. The data collection was done for 14 weeks. For the pre-instructional period, students in both groups were pre-tested to determine their writing abilities on the first week. During weeks 2-5, students in both groups were taught about how to write four kinds of paragraph in the classroom with PowerPoint and supplementary sheets. On the sixth week, students in the Google Docs group were asked to form a team of 4 members for working together using Google Docs. Everyone was taught about how to use Google Docs in class and created Gmail accounts. Students invited the teacher and their writing buddies to be collaborators, by simply entering their email addresses and clicking “Invite Collaborators.” Then they were asked to use Google Docs to do their assignments together. While working together, each collaborator will have a different color to distinguish what they contributed to the document. As students revised a document, the revision screen would show who worked on the document and when they worked on it. When students edited an essay, it could be easily seen who did what by comparing revisions or browsing through the revisions. Each team was to compose four kinds of paragraph writing with Google Docs starting from week 6 to week 13. The four assignments included a cause-to-effect paragraph, a descriptive paragraph, an opinion paragraph, and a process paragraph. The process started with a member’s posting his/her writing, followed by sharing the file to other members who helped in editing or giving feedback for paragraph improvement. In each writing task, students would reach an agreement of a final product. Students in the other group performed the same writing assignments, but worked together in groups in a face-to-face classroom. Students in both classes would submit each writing assignment to the teacher for feedback and improved their work accordingly before they started working on the next assignment. The intervention was followed by the post-test, a questionnaire, and an interview on week 14.

Data Analysis

All of the data got from the tests and the questionnaires were computed by Statistical Package for the Social Science version 12. A customized rubric was created to score the test papers. For each piece of writing, students earned up to 10 points in total, with up to four points for presentation of a clear main idea; three points for well organization; and three points for correct language use.

Table 1: Rubrics for paragraph writing.

Category	0 point	1 point	2 point	3 points	4 points
Content	No supporting details and examples	The main idea is supported with inappropriate reasons and examples.	The main idea is well supported with appropriate reasons but incorrect or inappropriate examples.	The main idea is well supported with only one appropriate reasons and examples.	The main idea is well supported with some appropriate reasons and examples.
Language Use	A lot of grammatical mistakes or misspellings	Some grammatical mistakes or misspellings	A few grammatical mistakes or misspellings	No grammatical mistakes or misspellings	-

Organiza- tion	The paragraph includes some elements of paragraph (topic sentence, supporting details, and conclusion) but no or incorrect use of transitional words.	The paragraph includes some elements of paragraph (topic sentence, supporting details, and conclusion) with correct use of transitional words.	The paragraph includes all elements of paragraph (topic sentence, supporting details, and conclusion) but no or incorrect use of transitional words.	The paragraph includes all elements of paragraph (topic sentence, supporting details, and conclusion) with correct use of transitional words.	-
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This study employed three examiners to mark the papers to ensure the fairness in scoring. One of them was the researcher and the other two were teaching this course at the Language Institute. In order to confirm the reliability of pre-and post-test scores, the inter-rater approach of reliability estimates was applied. The inter-rater reliability results of the three raters who rated the students' papers on the pre-test were 0.985 (1-2), 0.991 (2-3), 0.977 (1-3) meaning that the three raters had statistically significant inter-rater reliability. The inter-rater reliability results of the three raters who rated the students' papers on the post-test were 0.975(1-2), 0.977 (2-3), 0.967 (1-3) meaning that the three raters had statistically significant inter-rater reliability. The post-test mean scores of the two groups were compared using an independent samples t-test. P values < 0.05 were considered statistically significant. Data of attitudinal questionnaire got from the Google Docs group were calculated for mean and standard deviation and reported in a table based on the following ranges: 1.00-1.50 = very negative, 1.51-2.50 = negative, 2.51-3.50 = moderate, 3.51-4.50 = positive, 4.51-5.00 = very positive while data of questionnaire demonstrating how students worked in groups were assessed and shown in percentage.

RESULTS

The researcher checked the normality of the pre-test to see whether the samples were normally distributed or not. According to Table 2, the results were not statistically significant at the 0.05 level (df = 80, p > 0.05). This means the data of the sample came from normally distributed population. As the normality in the pre-test was normal, an independent samples t-test can be used to analyze the data.

Table 2: Normality of the pre-test.

	Kolmogorov- Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-test	.125	80	.053	.969	80	.057

To ascertain that the samples assigned to the face-to-face group and the Google Docs group were not initially different but homogeneous, an independent samples t-test was run to compare the pre-test scores of both groups. The Levene's Test for equality of variances shows F=.209 and p= .649, proving that the variance of the groups was equivalent. It was found that the pre-test mean score of students in the Google Docs group was a little bit lower than that of students in the face-to-face group (11.30, 11.48). The result showed t = .427, df = .78, and p =.670, indicating that the two groups did not differ significantly, but were homogenous (See Table 3). Therefore, it can be concluded that both groups were homogenous at the outset of the study.

Table 3: A comparison of pre-test scores between face-to-face and Google Docs groups.

Group	\bar{X}	S.D.	df	t	Sig (2-tailed)
Face-to-face Group (n=40)	11.48	2.05	78	.427	.670
Google Docs Group (n=40)	11.30	1.78			
Mean Difference	0.18				

Research Question 1: Was there a difference in the students' writing abilities between those working in groups in a face-to-face classroom and those using Google Docs to work collaboratively out of class?

Before running the t-test, the researcher checked the normality of the posttest to see whether the samples were normally distributed at each group or not. According to the table, the results were not statistically significant at the 0.05 level (df = 80, p >0.05). As the sample in the post-test was normal, the t-test can be further used.

Table 4: Normality of the post-test.

	Kolmogorov- Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Posttest	.085	80	.200	.987	80	.605

Before the intervention, the mean scores of students in both groups were 11.48 and 11.30, and those scores increased to 14.54 and 15.56 respectively. This means that the students' writing abilities could be improved by the two treatments after 14 weeks of intervention.

This research question explored students' writing proficiency after the intervention. To test the hypothesis and to see the efficacy of the intervention, students' writing scores obtained from the post-test of the two groups were compared to see if there was a statistically significant difference using an independent samples *t*-test as shown in Table 5. However, the result from a *t*-test analysis revealed the Levene's Test for equality of variances ($F = 2.440$ and $p = .122$) with a difference between the face-to-face group and the Google Docs group at a significance level of .05 ($t = 2.253$, $df = 78$, $p = .027$). So, the null hypothesis stating that no significant difference existed in the writing scores of the students who were controlled to receive the face-to-face learning environment and those in the Google Docs group was rejected.

Table 5: A comparison between post-test scores between the face-to-face and Google Docs groups.

Group	\bar{X}	S.D.	df	t	Sig (2-tailed)
Face-to-Face Group (n=40)	14.54	1.87	78	2.253	.027
Google Docs Group (n=40)	15.56	2.15			
Mean Difference	1.02				

Research Question 2: How did the students respond to collaborative writing activity using Google Docs?

According to Table 6, the overall mean score indicated students' positive attitudes towards collaborative writing activity using Google Docs (Mean = 3.70). The three highest scores of the students' attitudes fell on statements no. 6, 10, and 8 respectively. That is, the students had very positive attitudes towards sharing ideas with the other students (Mean = 4.70). Moreover, they expressed positive attitudes towards Google Docs' promoting collaborative learning environment (Mean = 4.20,) and on the increase of interaction with other students (Mean = 4.00). The lowest mean score of the questionnaire was statement no.7 showing that collaborative writing with Google Docs was perceived to promote knowledge information at a moderate level (Mean = 3.05).

Table 6: Means and standard deviations of student attitudes toward collaborative writing activity using Google Docs.

Statement	Mean	S.D.
1. I liked to see my peers interact with the content I had posted on Google Docs.	3.22	1.00
2. I felt comfortable to see other students edit the content I had posted.	3.98	.77
3. My group was able to come to a consensus by using Google Docs.	3.25	.82
4. I learned to exchange information with other students via Google Docs.	3.48	.78
5. The feedback and editing from peers were useful in improving my writing skill.	3.98	.80
6. Google Docs helped me share ideas with the other students.	4.70	.61
7. The use of Google Docs promoted knowledge information.	3.05	.78
8. The use of Google Docs increased interaction with other students.	4.00	.82
9. The use of Google Docs increased my motivation to study this course.	3.18	.93
10. The use of Google Docs promoted collaborative learning environment.	4.20	.69
Total	3.70	.25

Research Question 3: How much cooperation did the students have in collaborative writing activity using Google Docs?

Students in the Google Docs group were asked to report how collaborative the group work was and how they evaluated their group performance. The findings revealed that students rated only two responses high (75%) and very high collaboration (25%) while they evaluated their group performance rather differently: moderate (22.5%) good (45%) and very good (32.5%). When asked about how difficult this activity was when it was done in groups out of class using Google Docs, nobody reported difficulties. The replies were classified into two types: easy (82.5%) and very easy (17.5%).

DISCUSSION

This study was undertaken to assess, via a pretest-posttest using a quasi-experimental design, the effect of collaborative writing activity using Google Docs had on students' writing abilities. The result of the independent samples *t*-test analysis from the post-test administration indicated that the Google Docs group had a better performance than the face-to-face group. This might be because of three main reasons: the collaboration method, special feature of Google Docs which motivated students to learn more efficiently, and more contribution to work. As for the collaboration method, students were provided with opportunities to read, review, and correct other members' writing. With constructive feedback they got from the student readers, the student writers are able to learn about their writing problems such as inappropriate language use, misspellings, wrong mechanics, not understandable text, and illogical organization. Comments from peers which can be used for reconsidering both ideas and organization can lead to meaningful revisions for the student writers. It can be said that collaborative revisions can improve language defects such as vocabulary, organization and content. The findings were found to be in accordance with many previous studies in that the use of constructive feedback can enhance the quality of student discussion responses (Ertmer & Stepich, 2004; Ciftci & Kocoglu, 2012). Second, in this study, it is clear that Google Docs plays an important role in student learning. It is the tool that supports students to help one another in learning without restriction of time and place. Students can gain knowledge by comparing two versions of a document hence, increasing understandings of how sentences should be corrected. While working together, students generate online materials that reflect what they have learned and show connections between their prior knowledge, the course content, and their personal experiences (Oxnevad, 2013). The tool helps students collaborate on written assignments more efficiently, finish more quickly as compared to Microsoft Word (Apple et al., 2011). A great number of edited texts and comments appearing in Google Docs proved that students did not hold a sense of private ownership. They were comfortable when their texts got edited or deleted. The finding of this study confirmed the effectiveness of web-based writing in the previous studies which found that online technology was more useful for improving students' learning outcomes (Chen, 2008; Chou & Chen, 2008; Raman, Ryan, & Olfman, 2005; Vaughan, 2008). Lastly, contribution to do the writing tasks which can be seen by the team members and teacher was one factor to put more effort in their work. Although students in the face-to-face group also received collaborative learning, working together in a classroom may not be as vivid as working with Google Docs. It is rather difficult to investigate how much effort students in a face-to-face environment put in terms of equal contribution. Individual contribution given to assignments may not be equal. For Google Docs, the students know that their teacher can check who works less or more throughout the learning process. As such, students in the Google Docs group were more serious about collaborating and willing to follow the group conventions and practices. This may affect the improvement of the two groups' writing abilities.

The constructive finding is also supported by a positive attitudes students had towards collaboration on writing assignments out of class using Google Docs ($M = 3.70$). This is probably because Google Docs makes collaboration easier. It is accessible to the general public, regardless of location, as long as the Internet is available (Oishi, 2007). The high level of attitude also supported the possibility of the adoption of Google Docs-based learning in other classrooms. When the items were considered, the emphasis was mostly placed on sharing ideas with the other students, promoting a collaborative learning environment, and having interaction with other students. This suggests that students placed a lot of importance on relationship among peers. The finding was consistent with previous studies in that students perceived Google Docs as a useful tool for group work (Brodahl, Hadjerrouit, & Hansen, 2011; Zhou, Simpson, & Domizi, 2012). However, other responses such as "promoting knowledge information" which was rated at a moderate level should not be ignored. Students thought that gaining knowledge through collaborative working with Google Docs was not that much. The finding was found to be in contrast with the higher scores which students gained in the post-test. This is probably because students were not well-informed about the goal of mutual web-based learning. So, the teacher should emphasize on how the collaborative writing activity using Google Docs will benefit their writing. Furthermore, providing enough comments and suggestions during the process of collaborative revisions is highly required to make students feel like gaining knowledge and going to the right way. Without this, they may have less confidence in editing other members' texts. Moreover, there might be some possible confounding variables that could affect the students' improvement such as inconvenience of using computers and expertise in using Google Docs. Even though in the present study students did not report any difficulties in using Google Docs at all, real understanding about how to work with Google Docs is necessary if similar activities are used again in the future courses. Students should be trained and practice on it frequently before the actual use. In addition, the finding showed how responsible the students were for their written assignments. Their collaboration was rated at high and very high levels. Students learned how to work together in team. In this study, Google Docs was seen as a kind of friendly user that they used to complete the tasks. This increased students' learning motivation and supported what Swain & Lapkin (1998) stated in that students who work in collaborative groups appeared to be satisfied with their classes, and their learning motivation improved respectively.

The implications from the findings of this study support that Google Docs is a useful tool that makes online learning environment possible. Language learners can gain knowledge in a democratic and relaxing atmosphere where they can judge whether the mistakes should be corrected and learn to accept the comments from others. This is very different from the conventional teacher feedback pedagogy which does not provide any choices for learners. However, this study was restrained by some limitations. Since this research was conducted in a classroom setting, the sample size was rather small. The low number of students and the fact that all of them were studying at a private university might not allow us to generalize across other contexts. Therefore, with limited samples, the generalizability of the findings should be interpreted with caution and may extend only to this immediate population. In addition, while participating in the treatments, students enrolled in this English course were required to develop other skills comprising, speaking, and reading as well. Thus, students were also exposed to other types of input besides writing skill. The time constraint may cause different effects on findings in the study. So, this issue should be taken into account.

SUGGESTIONS FOR FUTURE STUDIES

Further research studies can be conducted to compare the effects of collaborative writing between face-to-face and Google Docs methods on students' writing motivation. If students are satisfied with learning through technology, assigning students to work together outside class can help language teachers save time and facilitate students' learning. Apart from this, students' autonomy and critical thinking skills may be investigated when other educational technologies are used to compare with Google Docs. Students can gain a lot of benefits of blended learning when technology is applied more in language classrooms.

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