Cloud Collaboration: Its Effect toward Writing Achievement and Impact toward Attitude to Learning

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Abstract

The study aims at finding out the effect of cloud collaboration toward writing achievement and students' perception toward its impact to attitude of English learning. It was an experimental study with pretest-posttest control group design, and the forty-eight samples of which were randomly taken from seventy-nine students taking paragraph writing course. The data were collected using an adapted writing test and cloud service impact questionnaire. The data from the test were analysed using t-test, while the data form questionnaire were descriptively analysed. The results show that there was an increase of writing achievement before and after the treatment and the increase was caused by the cloud collaboration implementation. The results also report that the cloud collaboration implementation had a high positive impact toward students' confidence, affective engagement and behavioural engagement to English learning, especially in writing course.

Keywords
Achievement, attitude, cloud, collaboration, writing

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Introduction

Writing is the core of learning activities in higher education. However, writing is the most difficult language skill to acquire in any language and even more so, writing in foreign languages (Lombana, 2002). Apart from that, writing is a difficult procedure that requires planning, composition, rewriting and modification (Vijayavalsalan, 2016). In line with these, some studies found out that students' results in writing test were not satisfactory (Persadha (2016), Arisman et al. (2017)). A similar indication was also shown by 51 respondents in my preliminary observations that they encountered difficulties in writing, even in composing a single paragraph. Process-oriented approach is not a new approach to writing. Recent studies show its application in the current learning context still produces good results. Al-sawalha (2014) in their study found that the process approach has the potential to develop writing in English more thoroughly. In addition, Sarhady (2015) revealed that the process approach motivated students to write better than the product approach.

Process-oriented Approach is part of collaborative learning. Collaborative Learning is the approach that involves groups working together to solve problems, complete tasks or produce certain products (Srinivas, 2011). The process of writing in learning using a process-oriented approach is called collaborative writing. Luna and Ortiz (2013) state that collaborative learning activities have helped students to think critically and be more open in expressing their opinions and ultimately helping students to improve their writing skills. In line with this, Zhang (2018) concluded that collaborative writing learning improves students' writing competence because this activity provides opportunities to learn through the language they use in the discussion process. In theory of second language learning, Krashen (1985) and Long (1985) state that the second language learning process depends on input. Input in the learning process is available in the interaction or communication process. Changing the input to intake also depends on the interaction process. This means that language learning can occur when there is communication. In line with this, Guan et al. (2006) state that through discussion and collaboration, learners actively shape their knowledge.

In the learning process, the collaboration occurs inside and outside the classroom. The process in the classroom can continue outside the classroom with the help of Information and communication technology (e-learning). The technology, even when in its early development is not as fast as it is today, according to Smith and Ragan (1999) can be an instructional medium which supports the success of learning compared to other technologies. It has standard internet platform providing support to independent learning process that is not limited to space and time due to the nature of the internet itself, which among other things can be used by anyone, anywhere, and anytime; and it is nowadays very much freely available. The combination of these two collaborative processes is included in the term blended learning (U.S. Department of Education Office of Planning Development Evaluation and Policy, 2010). Some results show that blended learning has a positive effect on English learning, such as positive perception in English blended learning classes (Liu,

2013), better learning results from the combination of synchronous and a synchronous learning mode (Jee & Connor, 2014), and that blended learning can support the English learning and other subjects in general (Sejdiu, 2014). Cloud computing technology (Cloud Computing Technology) is software or facilities provided as a remote service via the internet. The main form of cloud computing technology is a variety of internet services in the form of tools and facilities. Many companies provide cloud computing services, such as Google with Google Drive, Dropbox with Dropbox, and Microsoft with OneDrive. Chang and Wills (2013) explain that with cloud computing technology, activities to save work, continue work and share data can be done anywhere and anytime. The world of education can take optimal advantage of this technology with the ability to communicate and share information and data, such as text books, PPT files, videos, voice files, anywhere and anytime. In addition, collaborative work will be greatly assisted by this technology because of the ability to share data and information. Lin et al. (2014) in their study of collaboration with cloud computing technology (Cloud Collaboration) concluded that cloud computing technology can be an effective tool in education.

The Covid-19 Pandemic has changed the teaching and learning process condition dramatically all over the world. UNESCO (2020) has reported that almost one half billion students world over were forced to leave their face-to-face learning activity from school. In Indonesia, the government has decided that face-to-face learning are not allowed in red and orange zone. In the green zone, where the effect of the pandemic is not so widespread as the other two zones, face-to-face learning can be held but with strict measures of health protocols. In higher education setting in Indonesia, the government has decided as a response to the current situation to strengthen the online learning mode and to encourage universities to prepare a strong eLearning flatform. This current situation has led teachers and other educational practitioners to develop and use technique that can help students in learning. The use of cloud technology, among other advances, can be one of the answers of the education problem in the pandemic situation. From the discussion, it was shown that cloud collaboration application in a process-oriented approach writing class has the potential to help students develop their writing skills in the pandemic era. This potential are the results of the combination of collaborative learning strength in the form of a process-oriented approach and the conveniences offered by cloud computing technology. This study tries to a seek the answer to the questions: (1) whether or not there is in increase in writing achievement before and after the implementation of cloud collaboration in process-oriented approach can improve students of writing achievement, (2) whether or not the increase is caused by the implementation of cloud collaboration and, (3) to what extent is the impact of cloud collaboration implementation toward students' attitude of the teaching and learning process.

Literature Review

In the process-oriented approach, cognitive learning, learner's contribution to the learning context, and systematic thinking skills are the dominant aspects. Strategies used

include planning, objectives, gathering ideas, writing drafts, and revisions. This approach is actually rooted in the concept of Zone Proximal Development (ZPD), or the zone of optimal development (Vygotsky, 1978). In this concept, the optimal development zone lies between what learners can achieve on their own and what they can achieve with the guidance of teachers or other more capable students. This can mean that learners can achieve maximum results with the process of interaction/ collaboration with other people who have abilities that exceed their learning. Stanley (1993) states that good writers plan, revise, rearrange, and delete, reread and write several drafts in one process before completing their writing. This is the essence of the process-oriented approach in learning to write. The process approach is an answer to weaknesses in the product approach, i.e. excessive emphasis on language knowledge or linguistic knowledge, with a focus on language skills. Furthermore, writing activities in a process-oriented approach, such as collaborative writing, peer editing, and writing drafts have the potential to make learners more independent (Alwasilah, 2006). However, this approach is not too concerned with grammar and sentence structure and does not pay too much attention to the final result and takes a long time (Onozawa, 2010) and that this approach offers insufficient input to linguistic knowledge (Badger & White, 2000). There are five stages in the writing procedure in this approach, namely: (a) pre-writing (motivation to write, get shared ideas, create an outline, practice and take notes, (b) write a draft (initial writing both individually and in collaboration), (c) revising (re-planning and rewriting), (d) editing (preparing for text publication) and (5) publication (exposing text to the public) (Emig, 1971). These steps were then further developed by adding two stages, one at the beginning and one at the end, i.e. (1) topic selection, and (2) further activities to overcome the weaknesses shown by students in writing (Hyland, 2003).

The term of cloud collaboration can be defined as a way of sharing documents and collaborating in creating documents through the use of cloud computing facilities. The documents are uploaded to a central "cloud" for storage and can be accessed by others. 'Cloud computing', can be defined as shared access to a computer resource (Mell & Grance, 2006), as a compilation technique in which IT services are provided by massive low-cost computing units that are connected to Internet Protocol (IP) networks (Qian et al., 2009). Furthermore, they also state that there are five main characteristics of cloud computing: (1) large-scale computing resources, (2) high & elastic scalability, (3) shared resources (virtual and physical), (4) dynamic resources, and (5) general purposes. Examples of cloud computing facilities are Google with Google Drive and Google Documents, Dropbox with Dropbox, and Microsoft with OneDrive.

In the learning process, cloud collaboration facilities from cloud computing can be used in collaborative learning. Veldhuis-Diermanse (2002) defines collaborative learning as a learning situation in which learners exchange ideas, experiences and information to negotiate knowledge to form personal knowledge that will form the basis for shared understanding and collective solutions to a problem. Furthermore, Dillenbourg (1999) states that collaborative learning describes a situation in which a special form of interaction occurs between learners expected to occur triggering the learning process. In learning English,

collaborative learning generally has a positive impact on learning outcomes and perceptions of collaborative learning. Learners showed positive perceptions of collaborative learning implementation in writing class and they also showed better performance in writing (Challob et al., 2016). They also showed a positive response with good involvement in collaborative learning activities, although there were also negative responses (Hernández, 2012).

Google Docs is a free web-based application through which documents and spreadsheets can be created, edited and saved online. Files can be accessed from any computer with an Internet connection and a full featured Web browser. It is part of a comprehensive package of online applications offered by and associated with Google. Its users can import, create, edit, and update documents and spreadsheets in a variety of fonts and file formats, combining text with formulas, lists, tables, and images. It is compatible with most presentation software and word processing applications. Works can be published as web pages or as print-ready manuscripts. Users can control who sees their work. Google Docs is ideal for publishing within a company, managing a blog, or compiling work for the general public to see.

In higher education setting, Apple et al. (2011) found out that students thought Google Docs is more fun than Microsoft Word and even when editing and writing, students wrote longer and could write collaboratively more efficiently and faster than Microsoft Word. In addition, Brodahl et al. (2011) in their study found that students felt that they had positive experiences when collaborating using google docs. There several studies with similar focus with this current study. First, A study from Calvo et al. (2011) entitled "Collaborative Writing Support Tools on the Cloud" investigating an internet architecture, called iWrite, supporting collaborative writing from both student and teacher sides. In this study, no experiments were carried out on the effects of using iWrite in learning. However, the authors were optimistic about the benefits of the internet architecture. Second, Zhou et al. (2012) in their study entitled "Google Docs in an Out-of-Class Collaborative Writing Activity" which investigated the effectiveness of the google docs application in completing coursework by students by asking students to collaborate on coursework through google docs. The results indicate that Google is an effective application for collaborative writing and has an impact on learning. Third, Yim et al. (2014) in their study "Cloud-Based Collaborative Writing and the Common Core Standards" which aims to see how writing using cloud collaboration is carried out in schools in Colorado where computers and internet access available to all students. The results show that Google Docs specifically with simultaneous edit and access features encouraged students to write and revise more frequently than usual. Fourth, Zhu et al. (2017) in their study to develop the "Collaborative Editing Tool for Non-Native Authors (CEPT)", a computer tool providing an interface for collaborating in editing a text online as a tool for editing in writing collaboration found out that CEPT was able to significantly improve both the language quality and the collaboration experience. Fifth, Karsenti and Gauthier (2018) in their study entitled "Exploratory Study of Online Student Collaborative Writing with Teacher Metacognitive Prompts" which was carried out to test a student centered learning (SCL) program that combined the use of technology, writing, collaboration and feedback to see how far online and offline teacher feedback affects the quality of

writing, use of metacognitive strategies, sense of ability and motivation to complete writing. The results of this study indicate that collaborative use of technology has strengthened the use of metacognitive strategies, a sense of ability and motivation to complete writing. Sixth, Kurniawan et al. (2020) in their study entitled "Cloud Collaborative Reflective Strategy and Its Effect Toward English Pronunciation of Pre-Service Teachers in Their Teaching Practice Program" investigating the effect of both cloud collaboration and Reflection toward pronunciation mastery. The results show that the combination of both strategies has a significant positive effect toward the pronunciation mastery.

This current study is an experimental study of the implementation of cloud computing facilities in the form of cloud collaboration in writing classes using a process-oriented approach, as contrast the studies of Calvo et al. (2011) and Zhu et al. (2017), which are development studies developing software that can be used in online collaborative writing activities. While with the study of Yim et al. (2014), the difference lies in the research method where the study is descriptive and does not try to see the causal effect of the variables. For the study of Karsenti and Gauthier (2018), this study does not specifically pay attention to the elements of communication and information technology. Meanwhile the studies of Zhou et al. (2012) and Kurniawan et al. (2020), the use of google docs made it almost the same as this study, but the study did not focus on developing writing skills, the first focuses on course completion and the second on pronunciation aspect development.

Methodology

The population was all students taking the paragraph writing course in an English Education Study Program in the 2020/2021 academic year. The total number of students was 79. From the population, 48 students were taken randomly as sample. The samples were then divided randomly into experimental group (24 students) and control group (24 students). This study was experimental design with random sample selection. This research was carried out by dividing the research sample into 2 groups of writing class, the experimental group and the control group. The experimental group was given treatment in the form of "cloud collaboration" implementation in the "process-oriented approach" while the control group was only taught using process-oriented approach without the implementation of cloud collaboration. Both groups underwent a pre-test and post-test. The pretest and posttest scores were compared to see if there was an increase in writing achievement. The posttest scores in each group were compared to see if the learning model variable caused the increase. The perception of the sample students in the experimental group towards this learning model was also measured.

The term of cloud collaboration in this study is defined as the activities in which students in the writing class exchange ideas, experiences and information in the form of comment, suggestion and correction to the piece of writing another student has written. In this activity the teachers also shared their comment, suggestion and correction.

The teaching procedures in the process-oriented approach of the writing class were adapted from Emig (1971) and Hyland (2003), as follows: (1) topic selection, (2) pre-writing, (3) draft writing, (4) revising, (5) editing, and (6) publication,. The teaching material were adapted from Introduction to Academic Writing (Oshima & Hogue, 2007). In the writing class the students were asked to write 4 paragraphs, i.e.: (1) Descriptive Paragraph, (2) Process Paragraph, (3) Comparative Paragraph, and (4) Definition Paragraph. One paragraph writing process took one-week time as described in table one. The four paragraphs took 4 weeks to complete. Before the whole activity begins, the teacher has prepared folders on "Google Drive" label with each student's name. All writing process activities were stored in those folders.

Table 1. *Writing class procedures*

Stage	Personals involved in the stage	Activities	Learning interface	Day
Topic selection, Presentation	Students, Teacher	1. Class and small group discussion for topic selection 2. Teaching material for writing rules and grammar	Synchronous, Via Big Blue Button Asynchronous, via discussion forum	Day 1
Pre-writing	Students, Teacher	1. Writing outlines	Asynchronous via LMS	Day 1
Draft writing	Students	Draft writing using google doc, The drafts are automatically stored online in google drive Teachers can access this draft	Asynchronous, Via google doc	Day 1
Revision	Small groups of students (3 people)	1. Two students provide feedback on the draft on ideas, writing convention, choice of words, and language. 2. Students revise the draft based on the peer-feedback	Asynchronous, Via google doc	Day 2-3
Editing	Students and Teachers	1. Teachers provides detailed feedback to the revised draft on ideas, writing convention, choice of words, and grammar. 2. Students edit the revised draft based on the feedback.	Asynchronous, Via google doc	Day 4-5
Publishing	Students and Teachers	1. Students complete paragraphs 2. The lecturer read and evaluate	Asynchronous, Via google doc	Day 6-7

In the control group learning activities are carried out with the same model without the implementation of "cloud collaboration", the collaboration process was carried out via email, as compared to Google doc in the experimental group.

Data collection and analysis

To answer the research problem, two instruments were used to collect the data, i.e. (1) writing test and (2) questionnaire. A writing test was developed to measure students' paragraph writing achievement. In the test the students were asked to write a definition paragraph in approximately 200 words. They were asked to choose a word, custom, or holiday from their culture that is probably unfamiliar to an outsider and write a paragraph to describe it and explain its meaning and/or significance. They were also asked to focus on using good paragraph structure, with a topic sentence, supporting sentences that develop (explain) the topic, and a concluding sentence. The content of the test was validated by two experts in language testing. The test was given twice, as pre-test and after treatment as post-test. The paragraphs from the test scored were scored using Paragraph writing rubric on a scale of 1 - 5. The aspects assessed were: conventions, sentences, topic sentences, vocabulary, support sentences, and closing sentences. The results of test were grouped according to the scale in the Paragraph Writing Rubric, i.e. (1) Beginner, (2) Intermediate, (3) Writer, (4) Advanced, and (5) Expert. Two instructors from a language centre did the scoring of the paragraph.

To measure the impact of the implementation of the cloud collaboration toward students' attitude to the teaching and learning process, an adapted questionnaire from Cloud Service Impact Questionnaire (CSIQ) (Iji et al., 2017) was used. There are 34 items which were grouped in three aspects, i.e. (1) Confidence (10 items), (2) affective engagement (11 items), and (3) Behavioral engagement (13 items). The responses for items in questionnaire were of likert scale of 1 – 5. The benchmark point was determined at 2.5 (the midpoint of the scale). Result below it is considered as having low impact and higher is having high impact. The instrument was tried out to thirty non sample students for validity and reliability. The 34 item were found valid. The results of the try out show the Cronbach's Alfa Q was 0.742. T-test (paired-sample and independent, significance level of 0.05, two-tailed) was used to see if there was significant mean difference between the results of pre-test and post-test in experimental group and between post-test of experimental group and post-test of control group. The data from the questionnaire was analysed descriptively.

Findings

The results from the analyzed data are reported into two subcategory, test and questionnaire. ***Test,*** *the* results of the pretest and posttest in the two groups were scored using paragraph writing rubric on a scale of 1 - 5. The aspects assessed were: conventions,

sentences, topic sentences, vocabulary, support sentences, and closing sentences. These results are described in table 2.

Table 2. *Writing score distribution and writing skill level*

Aspects	Experimental				Control			
	Pretest		Posttest		Pretest		Posttest	
	Mean/ SD	Max/ Min	Mean/ SD	Max/ Min	Mean/ SD	Max/ Min	Mean/ SD	Max/ Min
Convention	2.38/0.50	2/3	3.08/0.28	3/4	2,54/0.51	2/3	3.00/0.59	2/4
sentences	2.5/0.66	1/4	3.25/0.44	3/4	3.04/0.69	2/4	3.29/0.46	3/4
Topic sentences	2.83/0.48	2/4	3.50/0.51	3/4	2.92/0.41	2/4	3.17/0.38	3/4
Vocabulary	2.92/0.28	2/3	3.21/0.42	3/4	3.38/0.49	3/4	3.67/0.48	3/4
support sentences	3.04/0.49	2/3	3.71/0.55	2/4	3.42/0.50	3/4	3.67/0.48	3/4
closing sentences	1.75/0.74	2/4	3.04/0.55	2/4	1.92/0.88	1/4	2.54/0.51	2/3
Total	2.57/0.37	1.83/3.33	3.30/0.31	2.67/4	2.87/0.46	2.3/3.8	3.22/0.34	2.7/3.8

Level of Writing Skills	Experimental		Control	
	Pretest	Posttest	Pretest	Posttest
Beginner	1 (4.17%)	-	-	-
Intermediate	19 (79.17%)	12.5%	14 (58%)	6 (25%)
Writer	4 (16.67%)	83.33%	10 (42%)	18 (75%)
Advanced	-	4.17%	-	-
Expert	-	-	-	-

From the table above, it can be seen that, in the experimental group, in pretest most of the students were in intermediate category and in posttest almost all of them were in the Writer category which was a level higher than the intermediate level. Even in posttest, one

student is in the advanced category whereas in the Control group the category improvement was not as good as the experimental group. The results of posttest showed an increase in the number of students who were in writer category, from 42% to 75%. The results show that there was a tendency that both groups experienced an increase in their writing achievement. However, the increase was higher in experimental group. Paired sample T-test results showed that there was a significant difference between the mean of pretest in the experimental group (M = 2.57, SD = 0.37) and posttest in that group (M = 3.30, SD = 0.31) with the requirements; t (23) = - 9.90, p = 0.00. These results indicate that there is a significant increase in grades after students are taught with this method. The results of this data analysis answered the first research question that there was a significant difference in the value of writing paragraphs before being taught using "Cloud Collaboration" in the "Process-Oriented Approach" Model and afterwards in Paragraph Writing Learning.

The results of the independent sample T-test for the posttest results in the experimental and control groups showed that there was no significant difference between the posttest mean of the experimental group M = 3.30, SD = 0.31) and the control group (M = 3.22, SD = 0.33) (t (46) = 0.822, p = 0.416)). While the results of the independent sample T-test both groups show that there was a significant difference between the mean pretest experimental results (M = 257, SD = 0.37) and the mean pretest control results (M = 2.87, SD = 0.46) with the requirement of t (46). = -2.483, p = 0.017).

From the combination of these two independent sample T-tests, it can be concluded that the process-oriented approach with cloud collaboration applications provides a greater achievement-enhancing effect compared to without cloud collaboration implementation. The results of this data analysis answer the second research question that there is a significant difference between the increase in scores in the group taught using "Cloud Collaboration" in the "Process-Oriented Approach" Model and in groups taught without Cloud Collaboration "in the" Process-Oriented Approach "Model. "

Questionnaire

The questionnaire's results answer research question 3, to what extent is the impact of cloud collaboration implementation toward students' attitude of the teaching and learning process. The mean of all item responses was 3.92. As show in table 3, the questionnaire has three aspects, i.e. (1) Confidence, (2) affective engagement and (3) Behavioural engagement. The means for each of the aspects respectively are 3.87, 3.94 and 3.92. These results indicate that cloud collaboration implementation has a high impact toward students' confidence, affective engagement and behavioural engagement of the teaching and learning process, especially in the writing class.

Table 3. *Mean score of each attitude as the impact of cloud service implementation*

Confidence				
No	Item	Mean	SD	Remark
1.	I am sure that I can learn English using cloud service.	4.26	0.59	High
2.	I find English is frightening with cloud services.	3.66	0.83	High
3.	I know I can handle difficulties in English with the aid of cloud service.	3.89	0.70	High
4.	I am proud of my abilities in English when aided by cloud services.	3.91	0.77	High
5.	I have an English idea which is enhanced with the aid of cloud services.	3.92	0.70	High
6.	I found English confusing with the aid of cloud services.	3.64	0.90	High
7.	I can handle most of subjects, but I only manage to endure English with cloud services.	3.74	0.71	High
8.	I know I can do well in English by using cloud services.	4.04	0.78	High
9.	I know cloud services are important but I don't feel I need to use them to learn English.	3.85	0.82	High
10.	I can get good grades in English with the aid of cloud services.	3.81	0.83	High
	Cluster Mean	3.87		High
Affective engagement				
No	Item	Mean	SD	Remark
11.	I like using Cloud services for English.	3,98	0,89	High
12.	In using cloud services to study English, I get my answer correctly as reward for your effort.	3,98	0,72	High
13.	Cloud service built my interest in learning new things in English.	4,11	0,78	High
14.	I find many English problems interesting and challenging with the aid of cloud services.	3,87	0,86	High
15.	Learning English through cloud services is enjoyable.	4,09	0,79	High
16.	I get sense of satisfaction when I solve English problems with the aid of cloud services.	3,91	0,81	High
17.	I feel good about using cloud services to study English.	3,92	0,87	High
18.	English is more interesting when using cloud services.	3,87	0,96	High
19.	I have never been excited about English with cloud services.	3,70	0,75	High
20.	I like the Idea of exploring English methods using cloud services.	3,94	0,77	High
21.	I always look forward to using cloud services to study English.	3,94	0,79	High
	Cluster Mean	3.94		High
Behavioural engagement				
No	Item	Mean	SD	Remark
22.	If I can't solve an English problem, I use cloud services to try out different ideas on how to solve the problem.	4,00	0,88	High
23.	I always try to do assignments with the help of cloud services.	3,98	0,84	High
24.	When studying English using cloud services, I often think of new ways of solving English problem.	3,96	0,73	High
25.	I think using cloud services waste too much time in the learning of English.	4,00	0,85	High
26.	Using cloud services to study English makes it easier for me to do more real life applications.	3,98	0,69	High
27.	When I cannot understand something in English, I always use cloud services to search for more information to clarify the problem.	4,09	0,84	High
28.	Having cloud services to do routine work makes me more likely to try different methods and approaches.	3,87	0,68	High

29.	Using cloud services in English is worth the extra effort.	3,64	0,83	High
30.	When I study for an English test using cloud services, I try to work out the most important parts to learn.	4,00	0,71	High
31.	When I study English using cloud services, I try to figure out which concepts I haven't understood.	3,89	0,78	High
32.	If I have trouble in understanding an English problem, I go over it again using cloud services until I understand.	3,98	0,69	High
33.	When I study English with the aid of cloud services, I start by working out exactly what I need to learn.	3,94	0,66	High
34	I find reviewing previously solved problems using cloud services to be a good way to study English.	3,98	0,72	High
	Cluster Mean	3.87		High

Discussion

The first question in the study aims investigating the effect of the cloud collaboration toward students' writing achievement. A paired-sample t-test was used to measure the mean difference of the pre-test and post-test scores. The results show the post-test score is much higher as compared to the pre-test. This result is in line with results from other study investigating the effect of cloud collaboration in a learning environment. For example, an experimental study conducted by Min et al. (2018) investigating the integration of a cloud learning environment (CLE) in learning process indicate an improvement in learning achievement of students. Apart from it, the results also reveal that cloud learning environment enhanced professional skills, and raised motivation. Furthermore, a study from Kurniawan et al. (2020) who examined the effect of the Cloud Collaborative Reflective Strategy (CCRS) on English Pronunciation of pre-service English teacher in which they applied cloud collaboration and Reflection to develop the pre-service teachers' pronunciation. The results report that there was a significant increase of pronunciation achievement in the sample. The pre-service teachers also perceived the CCRS as accommodating in the pronunciation aspect improvement. Another study from Suwantarathip and Wichadee (2014) which delved into comparing writing achievement of students who did writing assignment using Google Docs with those working in a classroom shows that students who worked collaboratively using the application has gained in increase in their writing score before and after the treatment. The students also perceived google doc as useful in collaborative work.

The second aim of this study is to seek the answer whether or not the increase was caused by the implementation of cloud collaboration. An independent sample t-test was used to see the mean difference between experimental and control group. The results show the superiority of experimental group which means that the increase of writing achievement in experimental group is caused by the cloud collaboration implementation. Several other studies have the common results. Zhou et al. (2012) in their study examining the effectiveness of the Google docs application in completing coursework by collaborating through Google docs reported that Google Doc is an effective application for collaborative writing and has an impact on learning. Another study from Yim et al. (2014) aiming to see

how writing using cloud collaboration is carried out in schools in indicated that Google Docs encouraged students to write and revise more frequently than usual. Furthermore, Zhu et al. (2017) in their study to develop the "Collaborative Editing Tool for Non-Native Authors (CEPT)", collaborative writing tool found out that it was able to significantly improve both the language quality and the collaboration experience. Karsenti and Gauthier (2018) who explored to test a student cantered learning (SCL) program that combined the use of technology, writing, collaboration and feedback to see how far online and offline teacher feedback affects the quality of writing, use of metacognitive strategies, sense of ability and motivation to complete writing found out collaborative use of technology has strengthened the use of metacognitive strategies, a sense of ability and motivation to complete writing.

This study also aims to highlight the impact of cloud collaboration implementation toward students' attitude of the teaching and learning process. The results described in table 3 reveal that the implementation of cloud collaboration had a high positive impact toward students' confidence, affective engagement and behavioral engagement in learning English, especially in writing class. This finding implies several notions. The adoption of cloud collaboration help students to overcome their psychological barriers and enhance their potential to achieve better, to develop personal interest and enjoyment in learning English especially in writing class, and to participate and involve in the writing class. Several other studies' result were in line with this result that the implementation of cloud collaboration was perceived as positive and having positive impact. Suwantarathip & Wichadee (2014) also reported that students had positive attitude collaborative writing using google Doc. Another study from Limbu and Markauskaite (2015) indicated that google service in collaborative writing activity had led the learners to participate and to engage in meaningful conversation. However, the study also reported that the tools cannot be useful by themselves without learners' interaction in using it. Alsubaie and Ashuraidah (2017) in their study on exploring writing individually and collaboratively using google docs in EFL contexts revealed that students perceived Google Docs as a useful tool for both individual and group work. Huang (2016) in their exploration of the intention to use cloud services in collaboration contexts found out that using the service can generate positive attitude and a belief that it is useful for learning. They also found out that the use of cloud service can contribute to behavioral intention.

Conclusions

This study aims at investigating the effect of cloud collaboration implementation in process-oriented approach writing class toward the students' paragraph writing achievement. This research also seeks to identify how students perceived the impact of cloud collaboration implementation toward their attitude of the English Class, especially in Writing Class. The findings of this research are based on the data obtained from the students of Paragraph Writing class of an English Education Study Program, a degree program in a university. The results of this research are linked to the findings of previous similar studies, and it confirms

that there was an increase of writing achievement before and after the treatment and the increase was caused by the cloud collaboration implementation. It also confirms that the cloud collaboration implementation had a high positive impact toward students' confidence, affective engagement and behavioral engagement.

A number of limitations to the research must be taken into consideration. The research has investigated the effect of cloud collaboration implementation toward paragraph writing achievement. However, the research has only concentrated the use of Google Docs as a collaboration tool. Investigating other tools may add more insights. Only the short-term effects of both memory and cognitive strategies were investigated. The study was conducted in university setting. It would add more value if it is also conducted in middle school. Based on the findings of this research and its limitations, some recommendations can be suggested. To widen the findings, a future study can investigate more tools for collaboration and can also view teachers' perceptions of the process. Future research can investigate cloud collaboration in different context and can compare all the contexts being examined.

Disclosure statement

There is potential conflict of interest was reported by the authors.

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