RESEARCH

PRE-SERVICE EFL TEACHERS' PERCEPTIONS OF ONLINE COMMUNITY OF INQUIRY IN COMPUTER-MEDIATED SYNCHRONOUS COLLABORATIVE TECHNOLOGY USING GOOGLE DOCS

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Abstract: Participation in online learning environments is increasingly popular following the advent of several computer-mediated communication (CMC) tools. There has been empirical evidence about the positive impacts of using synchronous collaborative technologies on students' classroom interactions and learning outcomes. This article reports on an examination of Google Docs as collaborative technology for group assignments in a content course on designing test items for young learners of English. A total 54 pre-service EFL teachers were examined for their perceived levels of participation, learning, social, and teaching presence in the online community where Google Docs was utilized as a collaborative platform for sharing work and receiving feedback. Main findings indicate the pre-service teachers' overall positive perceptions of the use of Google Docs, and their perceived levels of learning, teaching, and social presence were better than those in the face-to-face meeting condition. The results suggest a cohesive community where exchange of ideas and feedback took place effectively and Google Docs was perceived to improve feedback efficiency thanks to its synchronous and asynchronous feedback mechanisms. The study concludes with pedagogical implications for the use of CMC technologies in EFL classrooms and suggestions for future research.

Keywords: Google Docs, community of inquiry, learning presence, teaching presence, social presence, synchronous collaborative tool

Introduction

In modern times, smart devices have become part and parcel of our daily lives, or in Byng's (2015) words, these tools have become extensions of humans' psychological selves. It seems obvious that education has increasingly benefited from the use of a variety of technological applications, and that technology will continue to play significant roles with the development of different digital tools (Kochem et al., 2020). Technical affordances brought about by a multitude of digital tools and online interactive applications have transformed the ways teachers and students acquire knowledge, negotiate meanings, or interact with each other. In the classroom, the use of technological advances for formative assessment practices is expected to boost learning outcomes for their efficiency. Timmis et al. (2016) listed several affordances from technologies for assessment, including various ways to represent knowledge and skills via the use of

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multiple modalities from text, image, audio, video, to data visualization; enhanced opportunities for peer and self-assessment activities where learners are allowed to "exercise agency in the assessment process" (p. 6); more flexibility in terms of timing and location of assessment activities; increased collaboration via co-evaluation and peer assessment as "data can be jointly collected, shared, added to and commented on through the use of synchronous and asynchronous technologies" (p. 8).

Among various technological advances, computer-mediated communication (CMC) is becoming an increasingly popular way to conduct online or blended courses, especially in higher education teaching contexts (Garrison et al., 1999). Since the 1990s, computer-mediated communication with both synchronous and asynchronous media has flourished, enabling flexible ways for learners and teachers to communicate beyond the physical classrooms and overcome previous temporal and spatial constraints (Lomicka & Lord, 2019). As technology continues to make great strides, communication tools have provided us with multiple modes of interaction in the physical as well as virtual classrooms, via not only one-to-one but also one-to-many and many-to-many interaction. In Vietnam, the use of CMC is expanding at all levels of education and in different teaching contexts. Yet, there has been little research into the impacts of these technological applications on students' perceptions, learning process, and learning outcomes. Addressing this gap, the current study aims to examine the use of a popular CMC tool, Google Docs, as a collaborative platform for group assignments and feedback provision in a content course for pre-service English teachers who work together on joint tasks in writing items for English tests. The study is an attempt to look at an under-researched population with the use of Google Docs for a different purpose than collaborative writing commonly found in previous research.

Literature Review

Computer-Mediated Communication

Computer-mediated communication, frequently referred to as CMC in the literature, was defined in early research as "a process of human communication via computers, involving people, situated in particular contexts, engaging in processes to shape media for a variety of purposes" (December, 1997) or the "communication that takes place between human beings via the instrumentality of computers" (Herring, 1996, p. 1). A common focus of early definitions of CMC is on the examination of human-human interaction without clear conceptualizations about the mediating tool – the computer. Therefore, Carr (2020) urges the CMC research community to shift the focus from *computers* to greater focus on the mediation process in human communication. As technology progresses, computers can also be understood as any form of digital technology or device which "is used to transmit and receive meaning-laden messages between human communicators" (Carr, 2020, p. 10). In other words, the CMC scholarship should aim for deeper understanding of the impacts of computers or digital technologies on human communication processes.

CMC and Digital Affordances for Feedback Provision

Feedback provision as a form of human-human communication via digital tools is part of the CMC scholarship. Carless and Boud (2018) conceptualized feedback as a process during which learners receive and process information from various sources before making improvements to their work or better their learning strategies. This definition highlights the involvement of different stakeholders such as teachers, students, or automated sources of feedback

in this process. It also shifts the focus from the feedback givers (e.g., instructors, peers) to feedback receivers (i.e., learners themselves) who take on a proactive role in making sense of the information received to improve their learning. Molloy et al. (2020) posit that to put newly learned knowledge into practice, students have to actively "seek information, make sense of it and undertake subsequent tasks" (p. 528). It is widely believed that the feedback scholarship should be heading in this direction to highlight the two-way communication nature of feedback practices. Yet, previous feedback research has focused more on how the feedback is generated than how the feedback is perceived and processed by its receivers.

Thanks to the implementation of online collaboration tools or social media such as blogs or wikis, the way teachers and learners generate and receive feedback in joint learning tasks in the online learning environment has also transformed. In a well-functioning online community, there are huge benefits that learners can enjoy with digital affordances. Firstly, synchronous CMC platforms enable the combined feedback between spoken interaction and text comments. In addition, asynchronous feedback generated on wikis or Google Docs allow for recorded feedback which can be easily stored and retrieved at any point in time. Most text-based feedback modalities have commenting, underlining, highlighting, or track change functions and even the saving of different versions of text. All in all, technological advances have opened up new opportunities for the provision of feedback and also the ways feedback is addressed and responded to among learners.

Community of Inquiry Framework

With the rapid expansion of online and blended learning, teachers and learners' participation in virtual classrooms has gained greater research attention. An attempt to theorize teachers and learners' participation in collaborative online learning environments is Garrison et al.'s (1999) community of inquiry (CoI) framework which elaborates on the instructional, social, and cognitive processes taking place in the online learning community to create a successful higher educational experience. These make up the three dimensions in the CoI framework, namely teaching presence (TP), social presence (SP), and cognitive presence (CP) (Garrison et al., 1999; Hayes et al., 2015). Elaborating on CoI framework, Shea et al. (2022) posit that for learning to be a fruitful experience, the cognitive, teaching, and social dimensions of online educational environments have to be taken into account. In a cohesive and well-functioning community of inquiry, teachers and students jointly contribute to the cognitive, teaching, and social processes through interaction and collaborative knowledge construction. Garrison et al.'s (1999) CoI framework looks at the multi-dimensionality of participants' involvement in educational activities in virtual classes. Therefore, this framework provides excellent foundational tenets that characterize the interaction patterns taking place in blended or online learning environments.

Considered the most basic element to make higher education successful, cognitive presence is "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse" (Garrison et al., 1999, p. 11). Originally conceived based on the critical thinking literature and higher order thinking skills, cognitive presence in a CMC environment is not detached from learners' self-direction and self-regulation (Wladis et al., 2016). Cognitive presence is operationalized through the four phases of the practical inquiry cycle, namely *triggering event*, *exploration*, *integration*, and *resolution*. The

second dimension, social presence, indicates learners' projection of their personal characteristics into the CoI. Social presence supports cognitive presence through its facilitation of learners' critical thinking and higher order skills in the community of inquiry. CoI researchers identified three indicators of social presence in an online learning environment, including *affective expressions*, *open communication*, and *group cohesion* (Richardson & Swan, 2003; Rourke et al., 2001). Garrison et al.'s (1999) conceptualization of the third element in the CoI framework, teaching presence, indicates the roles of the teacher in designing the educational experience and facilitating learning processes. Facilitation, however, can be a shared responsibility among all participants, which Garrison et al. (1999) emphasized as a common feature of higher education in an online learning mode. In this sense, teaching presence supports cognitive and social presence and facilitates realization of learning outcomes.

About a decade after the proposed CoI framework, Shea and Bidjerano (2012) added a fourth dimension to the original framework, learning presence (LP), to emphasize learners' contributions to collaborative virtual education. Criticizing the original framework for its lack of clear elaborations on instructor and learners' roles, Shea and Bidjerano (2009) expanded the framework by adding learning presence whose indicators are associated with regulatory processes based on educational psychology. Learning presence stresses active and engaged learners' attitudes and behaviors which are projected during online collaborative tasks (Shea & Bidjerano, 2012).

Previous Studies

Suwantarathip and Wichadee (2014) compared two groups of Thai students' writing performance following two writing conditions: one group collaboratively composed their writing on four assignments outside the class using Google Docs, while the second group worked on the same four assignments but together in class. The results from writing tests after the intervention showed that the Google Docs group scored significantly higher than the face-to-face group, and students' perceptions of Google Docs as a collaborative online tool were very positive in terms of both its ease of use and opportunities for peer collaboration.

Shintani (2016) adopted a case-study approach to compare the characteristics of computer mediated synchronous corrective feedback versus asynchronous corrective feedback, both on Google Docs as the online platform. The difference between the two conditions lies in the time lapse between essay composition and feedback generation from the teacher. Using an elicitation task focusing on the use of hypothetical condition structure, followed by stimulated recall interviews with two Japanese EFL learners, Shintani (2016) found that both feedback conditions promoted noticing-the-gap and they also helped the learners acquire metalinguistic knowledge of the target structure. However, synchronous feedback is comparable to oral feedback in some certain aspects, and it encouraged students to focus on both form and meaning simultaneously while in the asynchronous feedback condition, focus on form and meaning took place separately.

Ishtaiwa and Aburezeq (2015) examined the impact of Google Docs on a sample of 178 pre-service teachers on increasing different types of interactions: teacher-student, student-student, student-content, and student-interface. Based on mixed data sources, the study found Google Docs an effective tool in encouraging instructor and peer interactions, and it can also boost student-content and student-interface interactions thanks to the features

and resources afforded by this technological tool. Some factors were also found to inhibit the use of Google Docs, including insufficient technological skills as well as some limited features on Google Docs which were not as quick and convenient as other types of communication applications (e.g., text messaging and emails).

Ebadi and Rahimi's (2017) explanatory mixed-methods study compared the impacts of online via Google Docs versus face-to-face peer-editing on Iranian EFL learners' academic writing skills. Twenty students were assigned to two groups whose performances on IELTS writing tasks 1 and 2 were compared using paired-samples and independent-samples t-tests. Although both groups improved in terms of academic writing skills, the Google Docs group made more improvements both in the short and long terms. The interview data further revealed students' positive perceptions of the impacts of peer-editing on Google Docs on their writing skills.

Later, Ebadi and Rahimi (2019) conducted a study to examine the impact of online dynamic assessment (DA) on three EFL tertiary students' academic writing skills as they were preparing for the IELTS examination as well as their perceptions towards such impacts. The online synchronous DA sessions were conducted individually with the students over Google Docs. Main findings indicate students' improved academic writing performance in all the studied areas of task achievement, coherence and cohesion, lexicon, and grammatical range and accuracy although students had some difficulty transferring their developed skills to more challenging tasks. Overall, all of the students expressed positive attitudes about the impact of online DA on their writing skills.

Hafour and Al-Rashidy (2020) conducted a quasi-experimental study to examine the impacts of collaborative narrative writing via Google Docs on 30 advanced EFL students' writing performance. The study revealed students' significant improvement in writing fluency and overall performance, but not syntactic complexity after nine weeks' intervention. Students' overall perceptions about the use of Google Docs for their narrative group writing activities were positive. The authors hypothesize that the synchronous and asynchronous interactive features on Google Docs and other similar tools make it easier for "different parties (i.e., instructor and students) to provide varied feedback including corrective and non-corrective, instant and delayed, content- and form-based, and peer and instructor feedback" (p. 137).

Research literature indicates the scarcity of studies on teacher and peer computer-mediated feedback. Also, most previous research has implemented Google Docs as an online collaborative tool for writing skills. Except for Ishtaiwa and Abureze's (2015) study, there is a dearth of research which has investigated the use of Google Docs in content courses which also require drafting and redrafting as teachers and learners interact. The reviewed studies highlight Google Docs' advantage as a collaborative tool where different stakeholders can communicate, generate feedback, and co-construct knowledge within a synchronous and asynchronous environment unbound by time and space constraints. Whether this advantage applies to other educational settings in a different content course is open to further research. It is, therefore, the goal of this study to extend this body of research by looking at the use of

Google Docs as a collaborative working space for pre-service English teachers for their joint projects on designing items of English tests for primary school students. Two research questions thus guided this study.

1. What are pre-service teachers' comparative perceptions of the feedback they receive on their assignments during online lessons via Google Docs versus in the face-to-face class?

2. To what extent does working collaboratively on Google Docs enhance pre-service teachers' perceptions of a community of inquiry in an online learning environment?

Methodology

Study Design

This study is a predominantly survey experiment with post-only and within-subjects design. Harasim (2012) proposed three models of online learning: online collaborative learning (OCL), online distance education (ODE) and online courseware (OC). Among these three, OCL focuses on student collaboration and the significant roles played by the teacher. Peer interaction, conceptual understanding, and knowledge products form the core of OCL (Kilis, 2016). The current research adopts OCL as the model on which the course is structured. The course entitled *Writing Tests for Young Language Learners* was taken by two classes of pre-service EFL teachers in Vietnam. Four assignments were delivered throughout the course when students worked in groups to write test items to assess young learners of English. The course was conducted in a blended mode, with some sessions taking place in the physical classroom, while others being conducted online using Zoom and collaborative tool Google Docs. Despite students' prior experience using Google Docs for other courses, they received training to use this Web 2.0 platform to interact on the shared file via the commenting, underlining, highlighting, and track change functions.

Participants

Two intact classes of a total of 54 participants took part in the current research. Class A had 30 pre-service teachers, while Class B had 24. Participants' age ranged from 20 to 21. All the participants were informed of the research purpose and their responses to the questionnaire were anonymized. Six participants were purposely selected and invited to attend individual interviews after they completed the questionnaire. The researcher got their permission to video record the interviews on Zoom.

Data Collection

This study employs a questionnaire, feedback samples from Google Docs files, as well as six individual interviews. All the participants were required to complete four group assignments as part of the course.

Procedures

Over a duration of a 12-week semester, student groups worked collaboratively on four item-writing assignments in weeks 5, 7, 9, 11. For Class A, group work took place in online meetings via Google Docs in weeks 5 and 7, while Class B had their group assignments conducted in face-to-face meetings. Conversely, Class A worked in class on weeks 9 and 11 while Class B worked online using Google Docs. Details about how the study was conducted are provided in Table 1.

Table 1

Class Timeline

Timeline	Class A (30 pre-service teachers)	Class B (24 pre-service teachers)
Sessions 1-2	Both classes were familiarized with *Google Docs* for conducting shared group work on writing test items for young learners of English.	
Session 3	Practice: Writing grammar test items Both classes submitted work on *Google Docs* and received teacher + peer feedback.	
Session 5	**Assignment 1**: Writing vocabulary test items	
	Online, via Google Docs	In class, using worksheets
Session 7	**Assignment 2**: Writing listening test items	
	Online, via Google Docs	In class, using worksheets
Session 9	**Assignment 3**: Writing speaking test items	
	In class, using worksheets	Online, via Google Docs
Session 11	**Assignment 4**: Writing reading test items	
	In class, using worksheets	Online, via Google Docs
Session 12	Pre-service teachers responded to the questionnaire.	
Session 13	Individual interviews with six pre-service teachers.	

Being a Web 2.0 application, Google Docs has several features which allow users to create, share, and edit documents, making the learning process more learner-centered and enabling collaborative efforts to develop their knowledge and skills. According to Hafour and Al-Rashidy (2020), Google Docs is among the cloud-based applications which allow for collaboration to take place in real time. They overcome shortcomings of other collaborative technologies in terms of its time and space independence, instant viewing of peer edits, and the varying degrees of synchronicity. Google Docs, as a digital technology, allows for participants' sharing of content and technical documentation. Thanks to its functions, Google Docs is a digital platform which can afford "persistence and editability of content, as well as interactive commenting and association with others for whom this content was relevant" (Gibbs et al., 2013, p. 107). In general, Google Docs facilitates three modes of collaboration:

Collaboration on text: This is done via the editor mode in Google Docs where

students could collaboratively write test items, and members of each group could add, delete, substitute, or rearrange items. This happened at the initial stage of the project when each group worked on their own construction of test items.

Collaboration around text: In the second stage, the instructor asked all the groups to cut and paste their test items to the shared Google document of the whole class. The shared document was initially set to the viewer mode and students were encouraged to read other groups' test items to give comments using the commenting features. The instructor also provided comments at this stage.

Collaboration through text: In the third phase, the shared Google document was set back to the editor mode so that each group could start making edits and revisions to their test items, incorporating teacher and peer comments. This process took place alongside oral feedback from the instructor and peers and more comments from them if they wished to do so, and revisions were done until the end of the class meeting.

In the remaining sessions, students worked face to face in class. Initially, they wrote test items on their worksheet. In the next stage, groups exchanged their items for peer feedback using a peer review worksheet. The teacher also generated feedback using a similar worksheet. Both peer and teacher review worksheets were completed in class and returned to each group for their revisions before they submitted the final test items to the teacher for summative assessments.

Questionnaire

The questionnaire about students' perceived community of inquiry is constructed based on Wertz's (2022) Web-based Teaching and Learning Link to Social and Cognitive Presence (WebTALK) survey which is comprised of four clusters representing four sub-constructs within the CoI framework: cognitive presence, social presence, teaching presence, and learning presence. Specifically, participating pre-service teachers were surveyed about their comparative perceptions of LP (four items via the motivational and behavioral subscales), TP (two items via the teacher facilitation and peer facilitation subscales), and SP (two items via open communication and group belonging subscales) as they collaboratively worked in the CMC environment using Google Docs and in the face-to-face meetings. In addition, six survey items are adopted for the purpose of the current research to reflect the nature of feedback generation and interaction in the CMC environment using Google Docs for group projects. Through these six items, participants' perceptions of the feedback received when working on Google Docs and in face-to-face sessions are examined. Each questionnaire item used a 1-5 Likert scale with the five response options: 1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Strongly agree.

Reliability was calculated to check internal consistency of the items related to students' perceived CoI using Cronbach's Alpha, which shows acceptable internal consistency ($\alpha = 0.900$ for perceived CoI in online classes and $\alpha = 0.803$ for the sub-set of items related to face-to-face classes). In addition, Cronbach's Alpha statistics for the cluster of six items on feedback perception are satisfactory, $\alpha = 0.920$ for feedback via Google Docs versus $\alpha = 0.918$ for feedback via worksheets.

Interviews

Acknowledging the fact that the use of five-point Likert scale items in the questionnaire may limit the depth of participants' responses, follow-up semi-structured interviews were conducted with six individual participants who are referred to using pseudonyms throughout this research. Video recordings of online learning sessions were observed and the comments posted by different class participants on the shared Google documents were tabulated to target this sub-group. To maximize variation within this sub-group for good representativeness of the whole sample, two participants who actively contributed ideas during the lessons with most comments posted in the shared Google documents (S1 and S2), two others who were moderately engaged with some comments posted (S3 and S4), and two who showed little engagement as they rarely spoke up in class with no posted comments on the shared documents (S5 and S6) were invited to take part in the interviews. Guiding questions delved deeper into their perceptions of using Google Docs for group assignments and the feedback they received from the instructor and peers either in the CMC platform and in face-to-face meetings using worksheets.

Data Analyses

The questionnaire data were analyzed using SPSS to obtain descriptive statistics. Specifically, the 54 pre-service teachers' responses to the five-point Likert-scale questionnaire items were entered into SPSS to calculate the mean, median, and standard deviation of each item. In addition, to compare participants' perceptions of the feedback received across the two working conditions (i.e., online via Google Docs versus in class using worksheets), as well as their perceptions of teaching, learning, and social presences when working collaboratively in either condition, the normality of the variables related to six items for feedback perceptions and eight items for SP, LP, and TP dimensions was assessed using the Shapiro-Wilk test. After statistical assumptions were checked, the non-parametric Wilcoxon signed ranks test was conducted on the set of six items for feedback perceptions and the second set of eight items for SP, LP, and TP dimensions in the CoI framework to seek answers to the two research questions.

Qualitative data from the six individual interviews were transcribed and checked for accuracy before their thematic coding analysis was conducted. Initially, the researcher screened the transcribed interviews to identify potential themes, which is followed by the creation of the list of codes for themes that align with the major issues addressed in the two research questions. Two major themes were (a) participants' perceptions of using Google Docs as a collaborative technology in online sessions and (b) their comparative perceptions of the feedback received via Google Docs versus that received during face-to-face meetings. On re-reading the transcripts, the researcher continued to identify sub-themes, including the benefits of using Google Docs and participants' perceptions of their learning, teaching, and social presence under the major theme of participants' perceptions, while the second major theme is comprised of the quality and quantity of the feedback received via Google Docs in online sessions versus on worksheets during face-to-face meetings. The finalized list of codes was used for double-coding on one transcript, with the

second coder being a colleague who is an experienced EFL lecturer with a PhD in Applied Linguistics. Differences were discussed and resolved before coding of the remaining five transcripts was conducted by the researcher.

Reliability and Validity

To ensure reliability and validity, this study employed three research instruments, including the questionnaire, interview, and documentation of feedback samples on Google Docs. The triangulation of data provides more comprehensive understanding of the two research aims. The reliability of the research is also managed through the fact that the author was the only one to collect data for both the questionnaire and interviews, ensuring the consistency in data collection procedures and eliminating issues related to data collection bias. In addition, validity of the research was obtained through efforts to use simple and straightforward language in the questionnaire and interviews to avoid confusion among respondents. Prior to their official administration to the 54 pre-service EFL teachers, the questionnaire and interview questions were also piloted among five students who shared similar educational backgrounds with the target sample, and any confusing language or unclear expressions were revised. Most importantly, the questionnaire was designed based on Garrison et al.'s (1999) CoI framework and Wertz's (2022) WebTALK survey, and therefore, the items were well conceived with clearly theorized constructs of measurement.

Findings

The findings are presented in response to each research question. In each question, quantitative data are presented first, followed by the qualitative data from the interviews to supplement and triangulate quantitative data.

Pre-service Teachers' Comparative Perceptions of Received Feedback

Statistical assumptions were checked regarding the data for students' responses to the 14 questionnaire items. The normality of all variables was assessed using the Shapiro-Wilk test, which shows that the data for all variables were not normally distributed. Therefore, the non-parametric Wilcoxon signed ranks test was employed to compare students' agreement levels with different statements about the effectiveness of giving peer and teacher feedback across the two conditions.

Table 2 presents the results of Wilcoxon signed-ranks tests which show statistically significant differences between students' perceptions of the feedback received via Google Docs versus via worksheets in face-to-face meetings. The results indicate that except for the effect of feedback on the pre-service teachers' understanding of learned materials, their agreement levels with the convenience, ease of use, promptness, support for making effective revisions, and solving problems related to item-writing were significantly higher for the feedback they received during online learning sessions via Google Docs than that on peer and teacher evaluation forms in face-to-face meetings.

Table 2

Students' Perceptions of Feedback via Google Docs vs. Evaluation Worksheets (N=54)

Statements **The feedback via…**	*Google Docs…*		*evaluation worksheets…*		**Wilcoxon signed-rank test**	
	Median	*SD*	Median	*SD*	*Z*	*p*
(1) is very convenient.	4.00	.97	4.00	.82	2.03	0.040
(2) is easy to follow.	4.00	.04	3.00	.91	2.47	0.012
(3) is delivered quickly.	4.00	.87	3.00	.92	3.50	< .001
(4) helps me understand the learned materials effectively.	4.00	.84	4.00	.71	1.77	.061
(5) helps me make revisions effectively.	4.00	.74	4.00	.84	3.13	.001
(6) helps me solve the problems related to item writing.	4.00	.81	4.00	.73	2.57	.007

Students' interviews add support to the questionnaire data regarding the feedback received on either mode. In general, most of the interviewed students commented that the use of Google Docs contributed to enhanced collaboration among students as well as between students and the instructor. In addition, they enjoyed much more support from the feedback delivered online via Google Docs in making effective revisions compared to the feedback they received on the teacher and peer evaluation worksheets in class. Table 3 summarizes the relevant comments on these advantages.

Table 3

Benefits of Google Docs on Feedback Delivery

Benefits	**Number of comments**	**Sample comments**
Boosting collaboration among students and instructors	5	*I think we were more confident in sharing our comments on our peers' test items during the feedback session on Google Docs. We were more comfortable with providing comments on the margin of the shared documents compared to giving written comments on the hard copies of other groups' assignments. Also, more people can add their comments simultaneously on Google Docs. (S4)*
Aiding effective revisions	4	*The feedback is instant, and once we've read the feedback, we can immediately revise to receive further feedback on our revised texts. This is much better than the delayed written feedback on paper worksheets. (S3)*
Convenient retrieval of feedback	4	*This tool allows me to refer to the comments and feedback at any later points in time to see if I can make more revisions to my work. (S2)*

Students' Perceptions of CoI

The second research question was examined by asking students to evaluate the impact of Google Docs on enhancing their perceived learning presence, teaching presence, and social presence in a community of inquiry with eight questionnaire items. Table 4 provides descriptive statistics about students' perceptions of working collaboratively online using Google Docs.

Table 4

Students' Perceptions of CoI Dimensions in an Online Learning Environment (N=54)

Dimension	Category	Statement	Mean	SD
Learning presence	Motivational	*I found working collaboratively on Google Docs very convenient.*	3.98	.96
		Working collaboratively on Google Docs made me engaged in the tasks.	3.76	.95
		Working collaboratively on Google Docs motivated me to contribute to the group assignments.	3.52	.97
	Behaviors	*I paid more attention to the questions and answers raised during the feedback session online via Google Docs.*	4.15	.79
Teaching presence	Instructor facilitation	*I received a lot of feedback from my instructor to complete the item-writing tasks well.*	4.32	.77
	Peer facilitation	*I received a lot of feedback from peers through comments and peer review to complete the item-writing tasks well.*	4.13	.91
Social presence	Open communication	*I felt comfortable providing and receiving comments from my peers and instructor.*	4.04	.91
	Group belonging	*Interacting and cooperating with other participants gave me a sense of community.*	4.17	.80

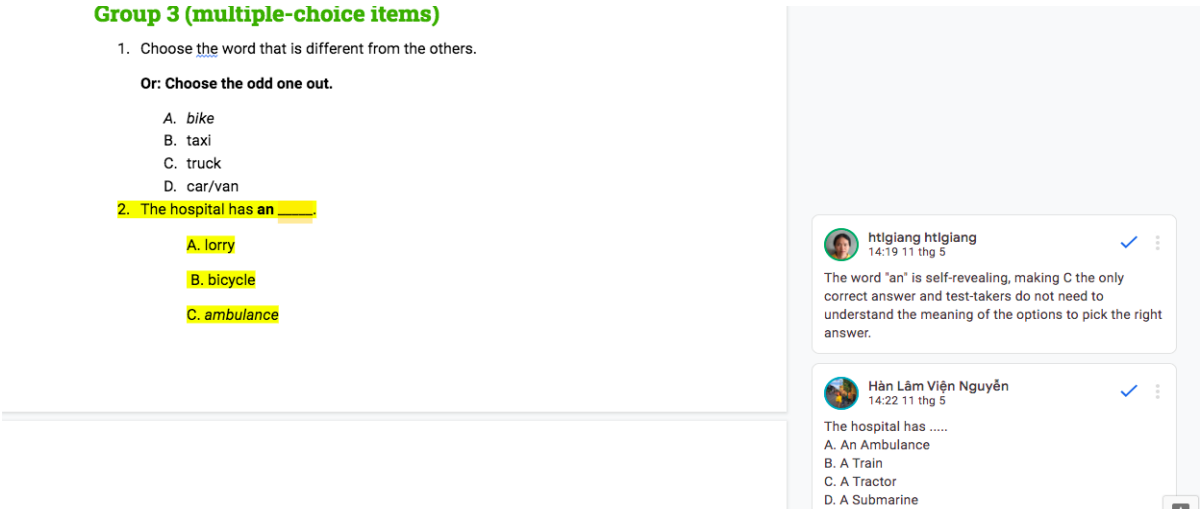
By using means and standard deviations of pre-service teachers' responses to the five-point Likert-scale items, the results show participants' high levels of agreement with the statements about the impact of using Google Docs as a collaborative tool for group assignments on their sense of community. Generally, participants agreed that Google Docs is able to promote a sense of group belonging and they reported feeling more confident to give comments on others' works. They also expressed high levels of agreement with statements about receiving a lot of feedback from both peers and instructor, with mean values ranging from 4.04 to 4.32. Correspondingly, the pre-service teachers concurred that they were better engaged in the learning tasks, contributed more to their group assignments, and were confident to raise more questions related to the item-writing tasks during teacher and peer review sessions online (M = 3.52 to 4.15, SD = .79 to .97).

Explanatory factors come from the fact that students were able to contribute simultaneously on Google Docs using side comments, as illustrated in Figure 1 below. In this excerpt, the instructor provided comments on a test item, which was

followed by a revised item by another class member which can be viewed by all of the participants synchronously.

Figure 1

An Example for Instructor and Peer Comments and Feedback



Learning Presence

Tables 5, 6, and 7 further present detailed information about Wilcoxon signed-ranks test results when the participants' responses to the questionnaire Likert-scale items were compared regarding students' perceptions of CoI when they collaboratively worked on Google Docs versus during face-to-face meetings. Generally, except for the third statement about motivation, the results show statistically significant differences between students' perceptions about the two collaborative modes (i.e., online via Google Docs versus face-to-face via teacher and peer evaluation worksheets), with statistically higher agreement levels for the statements about the positive impact of Google Docs on boosting the pre-service teachers' sense of group belonging via enhanced levels of learning, teaching, and social presence.

Table 5

Students' Comparative Perceptions of Learning Presence (N=54)

Statements **Working collaboratively …**	*online via Google Docs…*		*in face-to-face meetings via worksheets…*		**Wilcoxon signed-rank test**	
	Median	*SD*	Median	*SD*	*Z*	*p*
(1) is very convenient.	4.00	.96	3.00	.74	2.80	.004
(2) makes me interested in learning activities.	4.00	.95	3.00	.74	2.09	.032
(3) motivates me.	3.00	.97	3.00	.82	1.01	.301
(4) enhances my attention to the questions and answers during the peer review sessions.	4.00	.79	4.00	.72	3.84	<.001

Further elaboration on the convenience of Google Docs was expressed by the interviewed participants. Four of the participants concurred that Google Docs is a great collaborative platform which allows them to access the shared file around the clock and any changes made by group members are instantly updated:

> The greatest convenience is that with Google Docs, we can access the shared file on our smartphones anytime and anywhere. This allows us to easily collaborate for our group assignments. (S1)
>
> On Google Docs, we can contribute more ideas and have more discussion opportunities. Added to this, it is easy to make revisions if we've got something wrong. (S4)

The participants also appreciated the functions on this collaborative technology which aided them in looking for suitable online materials when they designed test items, "Using Google Docs saves us time as there are available resources, especially the images and pictures, to help us create more attractive test items for kids" (S6).

All in all, Google Docs as a collaborative tool in group assignments has advantages over traditional working modes as it tends to enhance participants' learning presence via convenient functions to access shared documents, retrieve information, give and respond to comments and feedback, as well as make edits and revisions accordingly.

Teaching Presence

Table 6

Students' Comparative Perceptions of Teaching Presence (N=54)

Statements **Working collaboratively …**	*online via Google Docs…*		*in face-to-face meetings via worksheets…*		**Wilcoxon signed-rank test**	
	Median	*SD*	Median	*SD*	*Z*	*p*
(5) I received a lot of feedback from my instructor to complete the item-writing tasks well.	4.00	.77	4.00	.77	4.44	<.001
(6) I received a lot of feedback from peers through comments and peer review to complete the item-writing tasks well.	4.00	.91	3.00	.78	4.45	.006

In the interview, S1 verbalized his thoughts about how he strongly felt the sense of teaching presence as he engaged in the online test item review activities thanks to the promptness of the teacher feedback delivered on Google Docs.

> Compared to working collaboratively in the classroom when we discussed and wrote down the items on paper for teacher and peer feedback, working collaboratively during online sessions via Google Docs allowed us to interact directly with the teacher as she provided comments and suggestions on our test items. Oftentimes, she did not provide the alternative items or directly corrected our mistakes. Instead, she gave hints about things

> that needed attention or correction. When we read her notes and comments on the side like "please review these options" [i.e., for multiple choice test items], we tried to come up with the revisions. Once we'd made changes to the options, the instructor reviewed them synchronously and suggested further corrections if needed. This means that we received two rounds of feedback, which is much more than the feedback received on the teacher feedback form in face-to-face meetings. (S1)

Social Presence

Table 7

Students' Comparative Perceptions of Social Presence (N=54)

Statements **Working collaboratively …**	*online via Google Docs…*		*in face-to-face meetings via worksheets…*		**Wilcoxon signed-rank test**	
	Median	*SD*	Median	*SD*	*Z*	*p*
(7) I felt comfortable providing and receiving comments from my peers and instructor.	4.00	.91	4.00	.80	3.24	<.001
(8) Interacting and cooperating with other participants gave me a sense of community.	4.00	.71	4.00	.78	2.52	.009

Enhanced social presence, according to the interviewed pre-service teachers, was thanks to the multi-way interactions between peers and instructor when they collaboratively worked on their assignment using Google Docs, as S1 commented,

> The use of Google Docs encouraged all participants to join, which turns the learning activity into a shared experience. For example, when we submitted our assignments on the worksheet to the instructor, which was later returned with the teacher feedback, we only learned about what we did well or what we needed to improve. However, working collaboratively on a shared Google document with other groups, I had a chance to look at test items designed by my classmates from other groups. Because of this, I learned from others' mistakes too… More importantly, besides the teacher, all other classmates also provided feedback on our work. Receiving feedback from both the instructor and peers is so useful.

Participants also attributed their positive feelings about the CoI via Google Docs to the fact that the commenting functions on shared Google documents helped them become bolder in generating feedback on other groups' test items during the review sessions,

> I believe that Google Docs makes us more confident in sharing our thoughts. Oftentimes, we are more reluctant to speak up in class to share our ideas. It is much easier to put down our ideas as side comments on Google Docs, and thanks to this, more participants are encouraged to join by contributing ideas for others to improve their works. (S6)

Discussion and Implications

This study examined the impacts of Google Docs as collaborative technology for group assignments on pre-service EFL teachers' perceived levels of CoI via the three dimensions of learning, teaching, and social presence. Main findings indicate positive impacts of this tool on enhancing participants' perceived levels of learning, teaching, and social presence in an online learning environment compared to the face-to-face meetings in class. What particularly stands out as a contributory factor to the enhanced feelings about LP, TP, and SP was the perceived ease and convenience of feedback delivery via the synchronous computer-mediated communication platform afforded by Google Docs.

Pre-service teachers' positive perceptions about the use of Google Docs as an online collaborative tool are in line with previous studies (e.g., Ebadi & Rahimi, 2017; Hafour & Al-Rashidy, 2020; Suwantarathip & Wichadee, 2014). From a constructivist perspective, online collaborative technologies could promote learners' learning skills thanks to a constructivist environment (Chou & Chen, 2010), which aids them in making more effective revisions. From a sociocultural perspective, formative feedback should be graduated, contingent, and dialogic (Bitchener & Storch, 2016), which are applicable to the peer and teacher feedback delivered via Google Docs. As mentioned in the interviews, the participants were happy about receiving more than one round of feedback from the instructor during the feedback session, which helped them address the issues in their test items properly and improve their work. The level of support usually started off with implicit and indirect feedback, which became guidance for learners' efforts in finding their own solutions for revised items. Instructor feedback is also often followed by suggested revisions from peers, showing some graduation of the feedback received. The synchronous communication during online lessons also allows for dialogic exchange on the provided feedback. In other words, findings from this study corroborate earlier research which found that synchronous computer mediated communication via Google Docs encourages dialogic and contingent feedback where learners can comment, edit, and revise the writings simultaneously (e.g., Ebadi & Rahimi, 2017; Kessler et al., 2012).

Regarding participants' enhanced perceived levels of learning presence during online meetings, the results partially explain what was found in earlier research about students' improved learning outcomes such as higher scores for the Google Docs group when it is used as a synchronous or asynchronous tool to deliver teacher and peer written feedback on student writing (e.g., Ebadi & Rahimi, 2017; Ebadi & Rahimi, 2019; Hafour & Al-Rashidy, 2020; Shintani, 2016; Suwantarathip & Wichadee, 2014). The feedback scholarship has generally indicated that both teachers and students tend to consider feedback generation as instructors' responsibility, and students are in no position to initiate or create changes to it (Molloy et al., 2019). The current study findings, however, suggest some evidence that shifts the paradigm when Google Docs is utilized for feedback and assessment purposes on group assignments. Through the implementation of Google Docs, students' agency is confirmed, evidenced in the participation of learners themselves as feedback providers (peer editing) and their active processing of the received feedback to make improvements. Learners have transitioned from "acting as active listeners to active seekers and utilisers of feedback, as well as generators of useful information for others" (Molloy et al., 2019, p. 538). Plus, with digital affordances, these feedback sources are delivered immediately

and synchronously for effective revisions. In the long run, teacher and peer feedback delivered via a synchronous and asynchronous collaborative tool like Google Docs in structured learning helps learners gradually progress from other regulation to self-regulation.

Perceived levels of teaching presence are also positive when the participants collaborated with peers to write test items and revised the items following teacher and peer feedback. This result adds support to the positive learning outcomes following the use of Google Docs as a synchronous CMC platform reported in previous research. This is thanks to the opportunities for more engaging pedagogy and novel forms of formative assessment afforded by interactive technologies like Google Docs (Timmis et al., 2016). The increased amount of feedback received by the participants seems to consolidate the roles of instructors and peers in helping each participant develop self-regulatory skills. Self-regulation is undeniably a great benefit of using Google Docs for joint work and three-way interaction among the instructor, student, and peers in an online learning environment, as "online learners monitor their time and cognitive strategies, regulate their study environment, and exercise control over their interactions with technology, peers, and faculty to maximize their learning" (Shea et al., 2012, as cited in Kilis & Yıldırım, 2018, p. 62).

Another key finding of this research is the pre-service teachers' favorable perceptions of the online sessions using Google Docs for group assignments, which enhanced their sense of social presence. Explanatory factors were mentioned in the interviews, including increased interactions among students themselves as well as between the instructor and students. In the current time, as learners have easy access to smart devices and technological applications, researchers posit that learners' digital selves may be bolder versions of their true selves. The human-machine interaction may have contributed to the changed perception of our self (Zimmermann, 2020), and via Google Docs, the participants were able to take on more proactive roles in a digital environment when delivering peer feedback and making revisions to their own work. They also tend to be more receptive of the feedback from both the instructor and peers in a less intimidating environment of online classes. When the participants' affective filters are lowered, which opens up a more relaxed space for communication, the participants tend to experience an enhanced sense of group belonging.

All in all, once the time and space constraints have been lifted and students are more emotionally relaxed to share and receive comments on their work, they benefit more from the interactions which support their progress and learning outcomes. Some pedagogical implications can be forwarded based on the findings of the current research. First, the use of Google Docs as an online collaborative tool can potentially enhance students' participation and sense of group belonging if properly used. The findings suggest that the use of Google Docs and other similar online collaborative tools is of great relevance to not only second language writing classes but also content courses, especially at tertiary levels where learners have easy access to smart devices. Similar to L2 writing lessons, blended and online content courses may benefit from the commenting, editing, and track change functions provided by this Web 2.0 application which works well for not only teacher synchronous and asynchronous feedback on student works but also for group tasks where students collaborate to produce an end product. This is partially because the implementation of collaborative technologies for classroom use provides learners with easy access to available online learning resources which help them better fulfill

learning tasks. This, in combination with the one-to-one, one-to-many, and many-to-many interactions among the instructor and students, can support each individual learner's development of self-regulatory skills and transition to self-regulation. Therefore, the application of Web 2.0 technologies should be made part of pre- and in-service teacher training programs, not only as a separate course but also as a regular tool for assignments and group work activities.

As said, the benefits of Google Docs as a collaborative tool can only be maximized if proper actions are taken to enhance course participants' social and learning presence. The findings particularly point to the perceived value of Google Docs as an effective feedback provision platform. Accordingly, content course instructors can encourage students to engage in peer feedback and peer editing activities via this tool on a regular basis. Strategies can be devised to ensure that all of the students contribute their ideas about peers' performance through variable levels of required feedback from general comments to diagnostic feedback (i.e., indirect to direct, generic to very specific) depending on their preferences and abilities. Under certain circumstances, the instructor can assign the roles of feedback providers to specific students on specific learning activities to make sure everyone can exchange feedback using the commenting functions on the shared document. Compared to the intimidating situation of speaking up to give oral comments in face-to-face meetings, posting a written comment on Google Docs provides a good starting point for less confident learners to share their ideas. It should also be made part of the requirements for course participants to collaboratively draft and redraft their works prior to submission to the instructor. This way, students can benefit from the multiple rounds of feedback conducted via online platforms like Google Docs. Overall, in order to create a cohesive online community, instructors need to take into consideration their teaching context, learner characteristics, available technological resources, and course contents to structure their teaching and incorporate digital tools appropriately.

Limitations and Recommendations for Future Research

The current study has a few limitations to be acknowledged. Being a predominantly survey experiment, this research measures pre-service teachers' perceptions through their evaluation of the impact of Google Docs on enhancing learning presence, teaching presence, and social presence in an online learning setting and how that compares to a face-to-face condition. The self-report data may not fully capture the depth and breadth of the participants' experience in an online community as well as the impacts of synchronous and asynchronous CMC tools like Google Docs. In addition, the predominantly survey experiment with post-only and within-subjects design may not guarantee the validity of inferences made about the impact of using Google Docs on pre-service teachers' perceptions of the online community of inquiry. Therefore, future research can adopt a pre-post experimental design to measure the impacts of these communication platforms on students' cognitive, behavioral, and social development.

It should also be noted that the study was conducted in a content course where pre-service EFL teachers learned to design language test items for young learners of English. Although this research context contributes a significant extension to the current CMC scholarship, the comments and discussion regarding students' positive perceptions of the use of Google Docs

should be taken with some precaution to avoid over-generalization to other teaching contexts. Future studies should, therefore, aim for a larger scope to include more participants across a wider range of domains, from language skills to content courses. In consistence with the collaborative nature of CMC digital tools, focus group interviews can be utilized as a data collection instrument to encourage productive discussion related to the four constructs in the CoI framework.

Also relevant to the depth and breadth of the participants' experience in an online community, the current research has not researched the cognitive dimension in the CoI framework. Other research instruments such as classroom observations combined with stimulated recall interviews and learners' reflective journals can shed further light on this fourth dimension. Building on the findings of the current study, a mixed methods approach to conducting research in this line of enquiry will promisingly shed light on students' educational experience in an online learning environment via the use of interactive technologies.

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NGHIÊN CỨU TRẢI NGHIỆM CỦA SINH VIÊN NGÀNH SƯ PHẠM TIẾNG ANH VỀ CỘNG ĐỒNG KHẢO CỨU THÔNG QUA ỨNG DỤNG CÔNG CỤ XỬ LÝ VĂN BẢN HỢP TÁC ĐỒNG BỘ GOOGLE DOCS

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Tóm tắt: Với sự ra đời của các công cụ giao tiếp dựa trên nền tảng công nghệ (computer-mediated communication – CMC), việc tham gia vào môi trường học tập trực tuyến ngày càng phổ biến. Một số nghiên cứu thực nghiệm đã chỉ ra tác động tích cực của việc sử dụng các nền tảng công nghệ đối với sự tương tác của người học trong lớp và kết quả học tập của họ. Nghiên cứu này khảo sát việc sử dụng Google Docs như một công cụ hợp tác trực tuyến được sinh viên ngành sư phạm sử dụng cho các bài tập nhóm trong một khóa học về thiết kế các bài kiểm tra tiếng Anh cho trẻ em. Tổng cộng có 54 sinh viên ngành sư phạm đã được khảo sát về nhận thức của họ liên quan đến ba yếu tố trong mô hình đào tạo truy vấn cộng đồng (community of inquiry – COI): sự hiện diện của quá trình học tập, sự hiện diện về nhân tố xã hội và sự hiện diện của quá trình giảng dạy trong cộng đồng học tập trực tuyến khi Google Docs được sử dụng làm nền tảng cộng tác để sinh viên cùng thực hiện bài tập nhóm và phản hồi lẫn nhau trong các giờ học trực tuyến. Kết quả nghiên cứu cho thấy những phản hồi tích cực của người học về việc sử dụng Google Docs. Cụ thể, họ có cảm nhận rõ hơn về sự hiện diện của quá trình học tập và quá trình giảng dạy cũng như trải nghiệm tích cực hơn về sự hiện diện của nhân tố xã hội so với việc thực hiện bài tập nhóm cùng nhau tại lớp theo cách truyền thống trên giấy. Kết quả cho thấy Google Docs đã góp phần tạo ra một cộng đồng khảo cứu gắn kết và là nền tảng để người học trao đổi ý tưởng và cùng hợp tác để hoàn thành tốt các bài tập nhóm. Google Docs cũng được người học nhận xét là giúp cải thiện đáng kể hiệu quả của quá trình nhận xét và phản hồi của giảng viên cũng như phản hồi đồng cấp. Dựa trên kết quả nghiên cứu, bài viết đưa ra những đề xuất cụ thể đối với việc sử dụng công nghệ CMC trong các lớp học và các hướng nghiên cứu vấn đề này trong tương lai.

Từ khóa: Google Docs, cộng đồng khảo cứu, công cụ hợp tác đồng bộ