Online collaborative writing:
learners' perceptions and their changes
using data visualization tools and interviews

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Abstract. This study investigated L2 learners' perception changes at each stage of online collaborative writing. Previous studies revealed the familiarity of L2 collaborative learning with Information and Communication Technology (ICT), whereas few described at which stage of the learning process L2 learners' perceptions change. Therefore, this study examines how the learners' attitudes and perceptions change at certain phases of collaborative learning and whether these changes affect the success or failure of their L2 collaborative learning. This study analyzed two questionnaire surveys before and after the learning activity, observed the collaborative learning processes via visualization tools, and conducted semi-structured interviews for participants to reflect on their learning processes and perceptions of collaborative writing. The mixed research analyses demonstrate that advancing a particular stage leads to the learners' linguistic awareness and the shift of their attitudes more positively. The findings show the factors and stages determining the success of L2 online collaborative learning.

Keywords: collaborative writing, mixed methods research, data visualization, language awareness.

1. Introduction

Collaborative learning is one of the major tasks in language learning. The teachers have conducted collaborative learning tasks for decades, and recent ICT

development and online instructions have boosted online collaborative writing and research (Arnold, Ducate, & Kost, 2012; Kessler & Bikowski, 2010; Lund, 2008; Yim & Warschauer, 2017). However, learners' involvement during a collaborative task remains unclear. This study investigated the shift in L2 learners' perception of online collaborative writing by focusing on the phases of the collaborative writing process.

2.   Method

Our research recruited 98 undergraduate students in two Japanese universities specialized in economics (n=38) and engineering (n=60). Their L2 competencies are estimated to be lower-intermediate (A2) to intermediate (B1).

The participants were asked to collaboratively write an essay consisting of several paragraphs using Google Docs for two weeks outside the classroom. They shared the same documents on their computer, decided their roles in their classes, and wrote the essay individually and in parallel. Both groups of university students conducted the same activities, while the topics given were slightly different; in one university, the participants were asked to translate the essays their instructor wrote in Japanese into English. The other participants from a science university, on the other hand, chose the topic by themselves and wrote their essays in English.

This study employed a mixed method research, integrating a quantitative questionnaire survey and qualitative interview research. First, we conducted the questionnaire survey before and after the learning period. The questionnaire was developed to examine the perceived usefulness, attitudes toward, and reluctance to collaborative learning. Then one participant from each group was asked to join a semi-structured interview. Each participant was asked to review and elaborate their writing process and their thoughts on the collaboration.

To observe participants' collaborative writing processes, we utilized two online tools on Google Docs: DocuViz (Wang et al., 2014) and AuthorViz (Wang et al., 2018; Yim & Warschauer, 2017). DocuViz counts the number of words the participants wrote and edited during their writing period. AuthorViz can detect the author who wrote a specific part of the collaborative essay. These tools help the examinees to observe the collaborative writing process. As for the questionnaire, we analyzed the survey results by dividing them into positive and negative responses. Interviews were coded by extracting relevant items and conceptualized using grounded theory. Finally, we examined the relationship

between the questionnaire and interviews. The results of our quantitative and qualitative research are described in the next section.

3.   Results and discussion

Figure 1 shows how one group conducts the collaborative task. The number of characters, or location of words in the essay was painted with each participant's color from top to bottom. As seen in Figure 1, the progress of the collaborative writing is visualized according to the timeline of writing. All participants joined the writing task one by one in Figure 1, which suggests this group planned the task well and successfully conducted the collaborative task with equal contributions. Not every group shows a similar pattern. Only a few members joined the task in some groups, or the contribution of each member is only once in another group. The overall progress can be grasped when used with a visualization tool.

Figure 1.   Docuviz visualization for how one group develops their collaborative writing
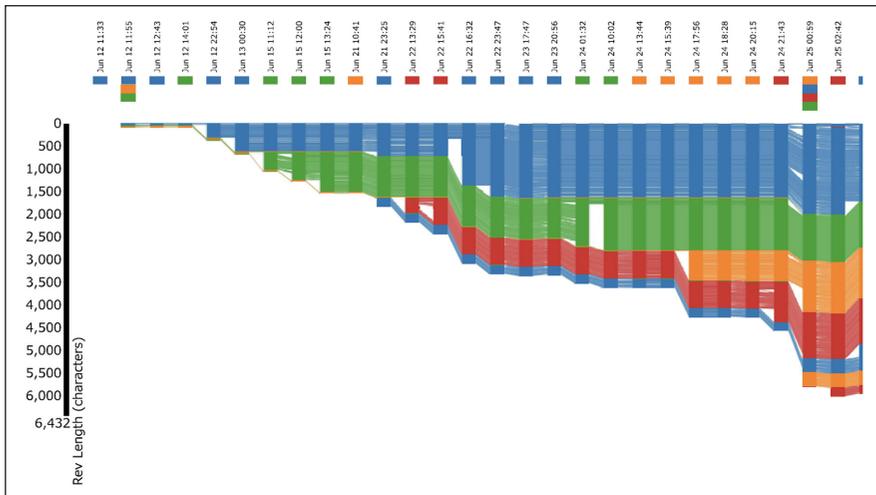
The questionnaire items in Figure 2 are as follows: usefulness for collaborative writing, such as improvement of grammar, contents, or organization (Q1-Q3); attitude to collaborative writing (Q4); preference to collaborative writing (Q5); and resistance of interaction with others (Q5-8). As for the questionnaire, the results of Q1 to Q4 decreased. Meanwhile, the results of Q5 did not change. The results of

their resistance (Q5-8) differed – the resistance to being read or revised by peers decreased, but the sense of inequality in contribution increased.

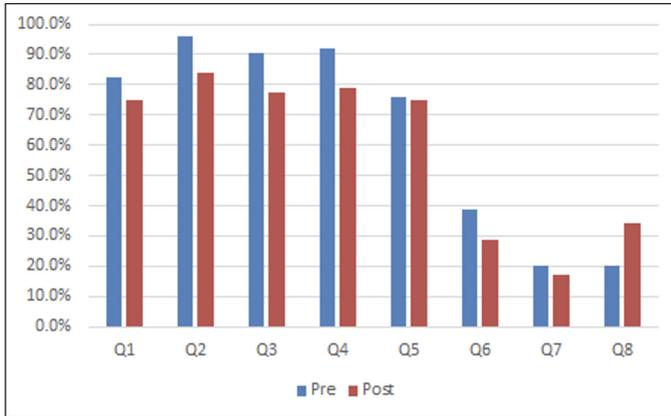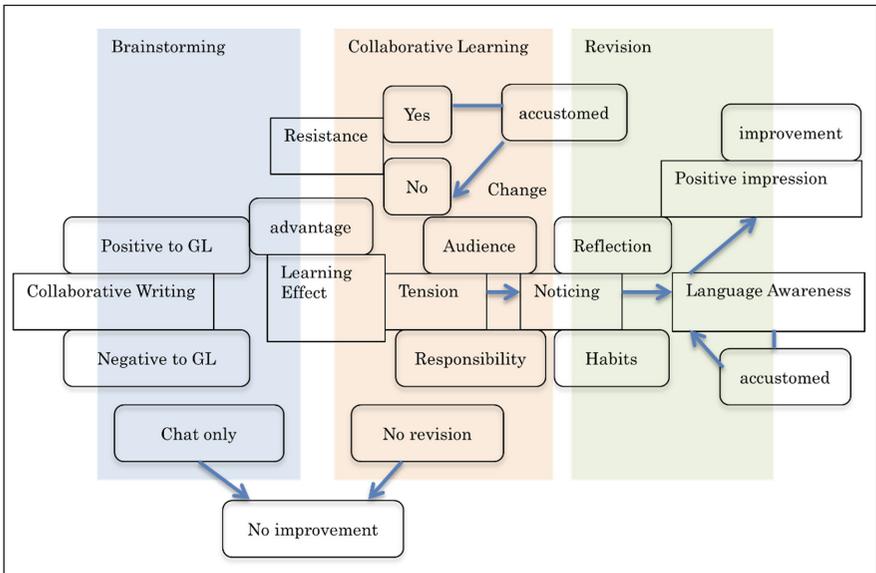Figure 2.   Positive responses (N1=75, N2=76)

Figure 3.   Analysis of interview based on grounded theory

The qualitative result of the interview in Figure 3 above shows how participants' perception changes in each stage of collaboration, i.e. brainstorming, collaboration,

and revision phases. In the brainstorming phase, participants had positive or negative perceptions of collaborative learning. Participants with positive perceptions noticed the advantage of collaboration. This advantage affected their collaboration through the subsequent two phases. On the other hand, participants with negative perceptions only talked about the task and did not improve their tasks or collaborative processes anymore. Their negative perception is due to member relationships, lack of time, and uneven contribution to the task.

When participants were in the collaboration phase, participants who were positive toward collaboration connected their perception to the learning effect. Their positive beliefs were that (1) it was good to read other participants' sentences; (2) it would improve their proficiency when they showed their writing to others; (3) they are getting accustomed to the collaborative task; or (4) it is good to hear advice from many other perspectives. Those beliefs all constituted their learning effect. Starting from this learning effect, three aspects of tension, noticing, and language awareness were repeated through collaborative learning and revision phases. Tension, consisting of audience, evaluation, and responsibility, would enhance participants' concentration. Debski (2006) claims an audience can be L2 learning motivation because they provide immediate support. Noticing has a somewhat broad meaning. Participants noticed new or different ways of writing, found mistakes objectively, recognized the lack of grammar or phrases, and obtained different lines of thought. Those noticing aspects led to the positive participants' language awareness in the revision phase. Participants could recognize their own or other participants' writing styles and choice of words, which increased their writing variation and urged self-reflection on their learning. Participants became aware of the organization of an essay, self-revision, syntax, and dictionary use. The more participants were accustomed to the task, the more they were conscious of language. The language awareness increases the positive impression of collaboration on them and improves their learning. If participants did not revise their essays, they could not improve their collaboration.

Although some participants did not resist collaboration from the beginning, some did. Some participants lacked self-confidence in their English proficiency. Others were reluctant to edit other members' sentences, partly because they had less confidence in their proficiency, did not know how to revise, or were afraid of revising their peers' drafts. That resistance, however, in many cases changed into their acceptance of editing. Some participants thanked other members for revising their writing, whereas others thought revision made them realize their lack of competency. In general, participants got accustomed to collaboration and decreased their resistance.

The questionnaire results suggest that the perception of usefulness and effectiveness decreases as a whole, because not all students have good impressions of collaborative learning. The data visualization and interview results, however, revealed that those with positive perceptions could obtain the learning effect of tension, noticing, and language awareness. Their positive perception could provide them with a good opportunity for collaboration, learning, and self-reflection.

4.　　Conclusions

Our mixed method study verified the shift in learners' perceptions toward L2 collaborative writing and examined how learners' awareness changes through the phases of the writing process that lead to successful collaborative writing. As a result of our analyses, when learners have a positive perception of collaboration, they are able to develop their language awareness gradually across each phase, leading to successful learning. Additionally, our research confirmed the usefulness of the data visualization tools in clarifying the direction of the analyses. Therefore, more mixed method research will be conducted for technology-enhanced L2 learning and teaching research using such visualization tools.

5.　　Acknowledgments

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