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Effects of Group Awareness Tools on Student Engagement and Enjoyment in Online Collaborative Writing

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Abstract: Group awareness tools have the potential to promote student engagement and improve the quality of online collaborative learning. However, few studies have explored the effects of group awareness tools on second language learners' engagement and enjoyment in collaborative writing. In this pilot study, we adopted a quasi-experimental design to examine whether the use of group awareness tools led to increased student engagement and enjoyment in online collaborative writing of English argumentative essays. The results revealed that the students in the experimental condition (with a group awareness tool) demonstrated higher behavioral engagement than the students in the control condition (without a group awareness tool), while no statistically significant difference was found in cognitive engagement and social engagement. Additionally, compared with those collaborated with the traditional method, the students using group awareness tools generally indicated higher enjoyment but the difference was only significant in the dimension of student support. Some discussions were made and suggestions for future studies were also provided.

Keywords: Group awareness, student engagement, enjoyment, online collaborative writing

1. Introduction

Online collaborative writing, as an effective instructional task, has been increasingly implemented in the field of second language education (Abe, 2021; Such, 2021; Yang, 2018). Online collaborative writing refers to pair or group writing tasks conducted online in which students interact, negotiate meaning, co-construct text, co-revise texts and jointly produce a writing text facilitated by technology tools (Li, 2018). A large body of research has documented the benefits of online collaborative writing such as raising audience awareness (Lee, 2010), enhancing writing skills (Bikowski & Vithanage, 2016), and promoting writing qualities in accuracy and complexity (Wang, 2015). However, previous studies have also identified that unequal participation or social loafing remains as a challenge that hinders effective collaboration and reduces students' perceived enjoyment of collaborative writing activities (e.g., Ducate, Anderson, & Moreno, 2011).

Researchers started to examine learning groups' participation processes in collaborative learning from the perspective of student engagement (Xu, Chen, & Chen, 2020). According to Fredricks, Blumenfeld, and Paris (2004), student engagement is a multi-dimensional construct which includes factors like behavioral engagement, cognitive engagement, and social engagement. Behavioral engagement refers to the participation and involvement of activities ranged from scholarly activities to social or extracurricular activities (Fredricks, Blumenfeld, & Paris, 2004). Cognitive engagement is the commitment to study on the psychological level (Fredricks, Blumenfeld, & Paris, 2004). Social engagement draws on the quality of social communication with teachers and students in academic tasks and school settings (Hoi & Hang, 2021).

Group awareness tools have been developed to solve the problem of low engagement in online collaborative learning settings (e.g., Peng, Li, Su, Chen, & Jiang, 2022). According to Bodemer, Janssen, & Schnaubert (2018), group awareness refers to perception or understanding of characteristics of learning partners or the collaborating group. The provision of group awareness information also serves as an implicit guidance for collaborative learning processes (Janssen & Bodemer, 2013; Schnaubert & Bodemer, 2019). Researchers have pointed out that being mutually

aware of contribution rates can stimulate motivational processes because students tend to avoid negative social evaluations by the group (Janssen, Erkens, & Kirschner, 2011). Previous studies have developed various group awareness tools and found that these tools can enhance student's engagement in the process of online collaborative writing (e.g., Janssen, Erkens, Kanselaar, & Jaspers, 2007; Janssen, Erkens, & Kirschner, 2011). For instance, to better support group writing processes, Calvo and his team (2011) developed a tool called Glosser that enables a team to understand how each member is participating in the collaborative and use this information to improve their collaboration. In addition, some emerging studies have also documented the benefits of group awareness tool for improving students' attitudes and perceived enjoyment toward collaborative learning in the CSCL environment (Yilmaz & Yilmaz, 2020). However, few studies have examined the effect of group awareness tools on student engagement and enjoyment in language education settings. Technology enhanced collaborative writing has been increasingly used in second language teaching practices, but this instructional method has also encountered problems such as low engagement and social loafing (Li, 2018). This study aims to explore whether the incorporation of group awareness tools in collaborative writing can enhance student engagement and enjoyment in the context of online collaborative writing of English argumentative essays.

2. Research Questions

To address these research gaps, we designed an online collaborative writing platform named *CollaWrite* which was embedded with group awareness tools to explore the effect of group awareness on student engagement and enjoyment in an online collaborative essay writing task. The two research questions guiding this study were presented as follows:

1. Did the students supported with group awareness tools show greater student engagement than those without the support of group awareness tools in online collaborative English essay writing?
2. Did the students supported with group awareness tools perceive more enjoyment than those without the support of group awareness tools in online collaborative English essay writing?

3. Methods

3.1 Context and Participants

This study was carried out in a college English course that aimed to improve students' English writing abilities at a key university in northern China. This course used an online collaborative writing task that lasted three weeks. The task required students to work in small groups to jointly write an argumentative essay on the same topic. Following Storch's (2013) guidelines for collaborative writing, participants within a group were required to interact with each other throughout the whole writing process and contributed to the planning, idea generations, editing, and revision. The writing task took the process writing approach and each group should complete three-round of writing. For each round of writing, the essay was randomly assigned to other groups for peer assessment and feedback. The whole collaborative writing task was conducted on an online platform which could offer a collaborative writing service and a synchronous chat room to help students communicate with their peers. In addition, group awareness information (e.g., the number of posts per student) was also provided by this platform.

Participants were 42 freshmen majoring in telecommunications and modern postal service. Since small group writing activities that consists of four or five members are found to be effective and are widely used in second or language education practice (e.g., Bikowski & Vithanage, 2016; Lee, 2010), the instructor in this study also randomly assigned these students into 10 groups of four or five students. Five groups were appointed as the experimental group supported with group awareness information while five groups were set as the control group without group awareness information support correspondingly. They took an English proficiency test before the experiment, and results showed no significant difference between the experimental and the control groups ($t=1.011$, $p=0.319>0.05$).

3.2 System Description

CollaWrite is a platform we developed that consists of three functional areas: collaborative writing section, chat room, and group awareness visualization. The group awareness tools used in this study provided four graphics on groups' behavioral engagement, a radar map of peer assessment scores, and a word cloud (see Figure 1). Firstly, group awareness tools on students' behaviors in the writing process can inform each group of its members' participation (the number of words written by per student), activeness (the number of logins per student), communication (the number of posts per student) and interpersonal relations. Instructor and group members usually use these visualized graphics to identify the individual contribution to the writing task. Next, scores of peer assessment are presented visually as a radar map from five cognitive dimensions: vocabulary, mechanics, content, grammar, and cohesion, aiming to assist group members in recognizing the shortcomings of their essay. In addition, the word cloud indicates the frequency of key words used in collaborative writing. With the help of word cloud, group members can easily observe what key words and key points the whole class was writing.

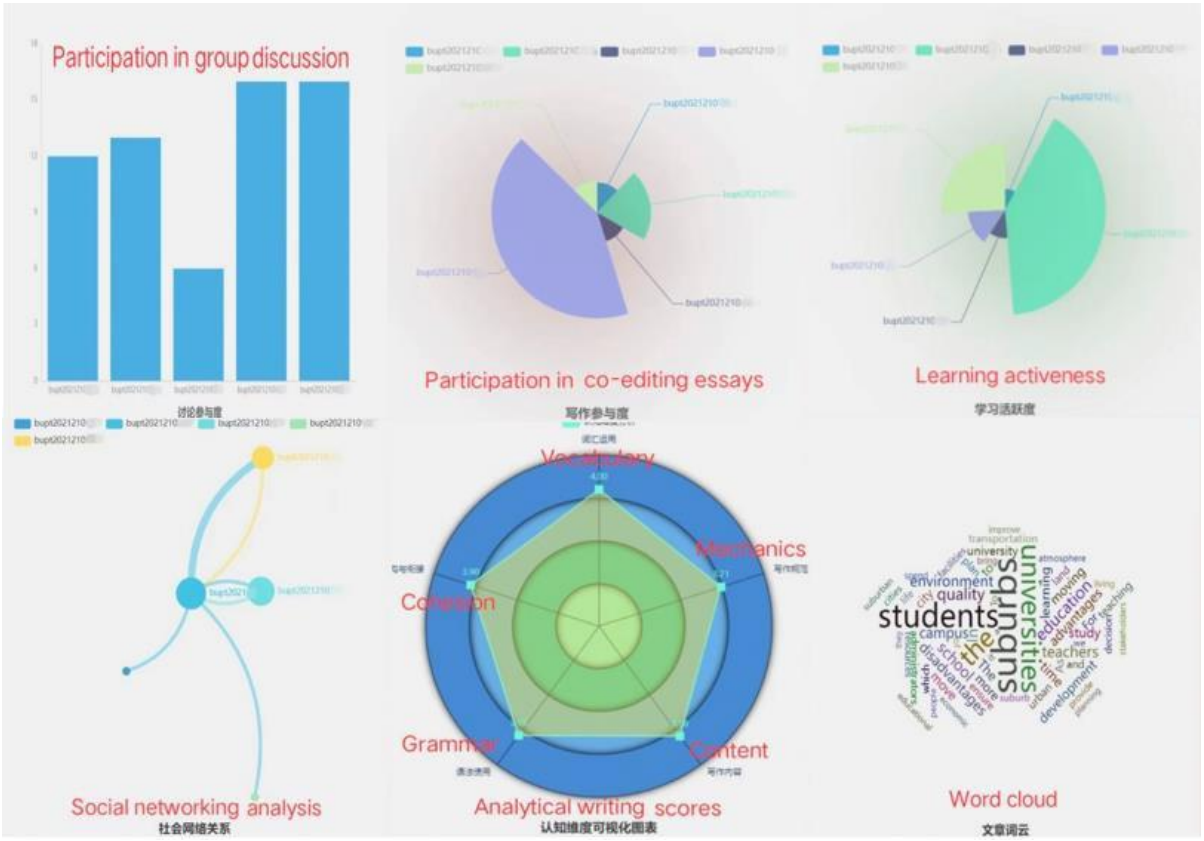

Figure 1. Group awareness tools

3.3 Data Collection and Analysis

According to this study, we adapted the Online Student Engagement Questionnaire (Hoi & Hang, 2021) and English Classroom Enjoyment Scale (Jin & Zhang, 2021) to measure student engagement and enjoyment in online collaborative writing with some modifications of the original instrument. The final version of instrument for assessing student engagement and enjoyment in this research included 32 items and was divided into 5 factors: behavioral engagement (7 items), cognitive engagement (5 items), social engagement (6 items), enjoyment of collaborative writing (4 items) and enjoyment of student support (4 items). Data was collected through a 5-point Likert survey scale ranging from 1 (strongly disagree) to 5 (strongly agree) with an overall Cronbach' s alpha value of 0.861 at the end of online collaborative writing task. The instructor sent this questionnaire to all participants, and altogether 37 valid responses (experimental group=18, control group=19) were received.

We first calculated means and standard deviations of student engagement and enjoyment in the experimental group and the control group. Then, a Shapiro-Wilk test used to explore whether these data obeyed a normal distribution. As the data violated the normal distribution, the present study employed Mann-Whitney U-test to compare student engagement and enjoyment between the experimental group and the control group.

4. Results

4.1 Effects of group awareness tools on student engagement

Table 1 displays the mean and standard deviation of behavioral engagement, cognitive engagement, and social engagement of the students in the experimental and control groups. From the descriptive statistical analysis results, we can see that the students supported with group awareness tools had higher behavioral engagement and social engagement while cognitive engagement was slightly lower than the students in the control group. However, the results of Wilcoxon-Mann-Whitney U-test revealed that statistical significance only existed in the dimension of behavioral engagement (z=-2.48, *p*=0.01).

Table 1. *Descriptive statistics and Mann-Whitney U-test for student engagement*

	Experimental Group		Control Group		*U*	*z*	*p*
	Mean	SD	Mean	SD			
Behavioral Engagement	3.90	0.40	3.48	0.67	90.00	-2.48	0.01*
Cognitive Engagement	3.77	0.52	3.89	0.59	140.50	-0.94	0.35
Social Engagement	3.22	0.70	3.10	0.74	147.50	-0.72	0.47

*p<.05

4.2 Effects of group awareness tools on student enjoyment

The second research question focuses on the effect of group awareness information on student enjoyment. Outcomes of descriptive analysis and Wilcoxon-Mann-Whitney U-test for student enjoyment are showed in Table 2. Results of descriptive analysis indicated that the students provided with group awareness tools showed more enjoyment in the online collaborative writing task. The result of Wilcoxon-Mann-Whitney U-test demonstrated that the difference in enjoyment of student support between the experimental group and the control group was significant (z=-2.51, *p*=0.01).

Table 2. *Descriptive statistics and Mann-Whitney U-test for student enjoyment*

	Experimental Group		Control Group		*U*	*z*	*p*
	Mean	SD	Mean	SD			
Enjoyment of Collaborative Writing	3.86	0.73	3.68	0.69	156.00	-0.46	0.65
Enjoyment of Student Support	4.35	0.46	3.80	0.71	89.50	-2.51	0.01*

*p<.05

5. Discussion

The purpose of this research is to explore the effect of group awareness tools on student engagement and student enjoyment in online collaborative writing. The results revealed some differences between the experimental group and the control group in student engagement and enjoyment of collaborative learning. Participants in the experimental group demonstrated relatively higher behavioral engagement and enjoyment of student support in the overall process of online collaborative writing.

This study reveals that group awareness tools can promote students' behavioral engagement, which is consistent with the findings of Liu, Liu, & Liu 's (2018). This finding also corroborates with a previous study of Janssen, Erkens, Kanselaar, & Jaspers (2007) in that visualization of group

members' contribution in online collaborative learning (e.g., the number and average length of discussion entries posted by each group member) is beneficial for increasing students' online participation. In addition, Li, Li, Zhang, & Li (2021) also found that students with group awareness information performed more cognitive behaviors such as negotiation of meaning and construction of new knowledge in their discussions. However, this study does not find positive effect of group awareness tools on cognitive engagement and social engagement.

Regarding student enjoyment, those provided with group awareness tools during online collaborative writing appreciate group member' support more than students without group awareness information, which is in line with Rojas et al.'s (2022) finding that group awareness tools can promote students' positive emotions toward online collaborative learning.

There are some limitations in this study. First, the sample size in this pilot study was relatively small. Future studies are suggested to enlarge the sample size to further explore the effect of group awareness tools on students' cognitive engagement, social engagement, and student enjoyment in online collaborative writing. Second, this study adopted a quantitative approach using self-reported questionnaire data. Future research on effects of group awareness tools needs to adopt a mixed method to collect both quantitative and qualitative data through interview, classroom observation or content analysis.

6. Conclusion

Using a quasi-experimental design, the current research examined the effect of group awareness tools on student engagement and enjoyment in online collaborative writing. The findings revealed that group awareness tools could effectively increase students' behavioral engagement and student enjoyment of *student support* in an online collaborative writing task. However, no statistically significant difference was found in cognitive engagement and social engagement. Additionally, compared with those collaborated with the traditional method, the students using group awareness tools generally indicated higher enjoyment but the difference was only significant in the dimension of student support. This study contributes to our understanding of the role of group awareness tools in computer mediated collaborative language learning.

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