Effects of peer-review on Peerceptiv in English writing

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ABSTRACT

Peer review refers to the activities that students review each other's works and put forward suggestions for modification. In the process of peer review, students are both writers and reviewers, which is conducive to playing an active role for students in improving their writing ability. This current study investigated effects of peer review of 18 English Majors' compositions and the comments (a total of 436) based on *Peerceptiv* online peer-review system. After detailed data analysis and discussion, this study draws the following conclusions: (1) The distribution of comments' types is different. From the three dimensions of affective, cognitive and meta-cognitive, students received the most cognitive comments and the least affective comments. (2) The implementation rate of different types of comments is also different. The comments that give clear suggestions for revision in the cognitive dimension have the highest implementation rate, while the comments expressing support in the affective dimension have the lowest implementation. (3) By investigating the improvement rate of students' second draft, it is found that peer-review comments have a positive impact on the improvement of students' writing performance.

Keywords: Peer review, Peerceptiv, effects of comments

1. INTRODUCTION

Writing is always considered to be one of the important basic skills of English learning. However, it is quite difficult for learners of English as Foreign Language (EFL) to master it. In this regard, many scholars have carried out some researches with different teaching methods to improve students' writing ability, but there seems to be few proper teaching methods to cultivate students' interest in English writing.

Peer review, as a new way of evaluation, is a kind of activity that learners provide or receive peer feedback in oral or written ways in the process of learning[1]. It is an important tool in the second language writing process, and is conducive to promoting the development from students' actual level to their potential level[2]. This study mainly focuses on the types of peer-review comments and their impact on students' writing performance in English writing. The purpose is to improve students' implementation rate of peer-review comments and enhance the reliability and validity of peer review, which can further improve the application and development of online peer-review model in English writing in order to overcome the disadvantages of summative writing review in traditional teaching methods.

Based on the previous studies, this research will take advantage of *Peerceptiv* (an asynchronous web-based writing platform) to focus on peer review in English writing, and explore the implementation rate and the influence of peer-review comments on second-year undergraduate students majoring in English.

2. RESEARCH STATUS

Peer review, also known as peer feedback, peer assessment or peer evaluation, is an activity in which learners provide or receive peer evaluation that can be oral and written for their peers in the learning process[3]. From the 1990s, researchers began to apply peer review to second language writing teaching and research. And they mainly focused on the following three aspects: (1) students' emotional attitudes towards peer review, (2) the effectiveness of peer review on writing, and (3) the studies on peer-review comments.

In order to investigate students' emotional attitudes towards peer review, Tusi and Ng[4] did a study among secondary L2 learners in Hong Kong. The results indicated that peer comments strengthen a sense of audience, improve collaborative learning, promote learners' awareness of their own strengths and backwards, and foster the ownership of text. The

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effectiveness of peer review has been recognized by many scholars. For example, Guerrero and Villamil[5] found that in the process of peer evaluation, the Zone of Proximal Development was reflected in the level gap between reviewers and writers. In this area, peers provide support to each other, which helps to improve their writing abilities together. Cai[6] compared the similarities and differences between peer feedback and teacher feedback in Chinese college students' English writing in the online environment and found that peer feedback can enhance students' sense of readership, increase their motivation to learn and master English writing skills, and help students form an English learning community. For investigating the impact of different types of peer-review comments on students' writing performance, Cai et al.[7] classified the types of peer-review comments into affective, cognitive, and meta-cognitive dimensions, and found that cognitive comments improved the quality of students' works more than other types of comments. In the paper *The Nature, Reception, and Use of Online Peer Feedback in Higher Education*, J. Van Der Pol et al.[8] focused on studying the use of online peer feedback in higher education from the type of peer comments and the successful adoption of feedback. They investigated the relationship between the types of students' feedback, the evaluated way of the receivers, and the revision of students' works. The results revealed that comments that directly point out suggestions for revision are more likely to be adopted by students.

Through the review of relevant literature above, more and more scholars are paying attention to the effectiveness of peer review from the progress of students, implementation rate or revision of texts. Although the effectiveness of peer review has been verified by most of the scholars at home and abroad, this study gives the priority to make students aware of the significance of peer review, help to improve the implementation rate of the peer-review comments and try to find an effective way for domestic teachers to instruct students to accept and use peer review.

3. METHODS OF THE RESEARCH

3.1 Research questions

This study aims to explore the types and effects of online peer review in English writing and further investigate and analyze how different types of peer-review comments are implemented on draft revision. Therefore, this research puts forward the following three questions which need to be solved.

(1) What's the distribution of different types of peer-review comments?

(2) How about the implement rate of different types of peer-review comments?

(3) What is the impact on students' writing performance after the peer-review comments are adopted?

3.2 Research subjects

In April 2021, Shanghai Foreign Language Audio and Video Publishing House, together with the Editorial Department of Foreign Language Education and the Committee of Foreign Language Education Technology of the Chinese Association of Comparative English and Chinese Studies, organized the 2021 "*Love Future Cup"* National College English Writing (*Peerceptiv*) Teaching Competition. This competition required students to submit an English essay on the topic of Family Education, give comments to their peers and revise their essays according to the comments they received. In this study, 18 sophomores in English majors from an application-oriented university in Anhui, China, were selected as the subjects, and their essays and peer-review comments produced in this competition were used as the research corpus to analyze the types of comments and their influence on the revision of essays. All the participants are native Chinese speakers and learners of English as Foreign Language, who have learned English for at least 12 years.

3.3 Research instruments

Peerceptiv, formerly known as Scaffolded Writing and Rewriting in the Discipline (SWoRD), is an asynchronous web-based writing platform originally developed by the University of Pittsburgh in 2002 and later developed into a commercial computer-assisted writing instruction product that was renamed *Peerceptiv*[9]. This system has four core functions: anonymous peer review of compositions, structured reviewing rubrics, back evaluation and evaluation of scoring accuracy, which also are the advantages of this platform. This study used the reviewing rubric that officially released by 2021 "*Love Future Cup*" National College English Writing (*Peerceptiv*) Teaching Competition. This rubric consists of four dimensions: content, organization, language, and mechanism. It is important to note that each dimension has specific statements and related questions to help students better understand the requirements of each dimension and to provide specific and accurate feedback on their peers' compositions.

3.4 Research procedures

According to the schedule of competition, the research procedures have been divided into three stages, namely the pre-experimental stage, the experimental stage and the post-experimental stage.

In the pre-experimental stage, participants were required to receive some training. The purpose of receiving training was to help them to be familiar with the basic operations of the *Peerceptiv* system, mainly including how to create an account, join a class, upload a composition, etc. During this stage, the instructor mainly focused on teaching students how to use this system for peer review, back evaluation, and scoring in order to avoid unnecessary problems and troubles during the competition.

The experimental stage was the time of this competition. In this stage, students needed to finish the following tasks: (1) write the first and second drafts and submit, (2) two rounds of peer review, (3) two rounds of back evaluations. The competition required students to write an essay of no less than 180 words and no more than 250 words on the topic of Family Education. After the tasks were officially released, students could follow the requirements of each task to do the corresponding operations.

Table 1. Coding scheme for types of peer-review comments.

Dimension	Category	Definition
Affective	(A1) Supporting	Comments expressing support and praise.
	(A2) Opposing	Comments showing negative feelings about the work.
Cognitive	(C1) Direct correction	Comments judging the correctness of the work.
	(C2) Personal opinion	Comments of general advice or personal opinions without indicating specific ways to revise.
	(C3) Specific guidance	Comments containing concrete suggestions and approaches to improve the work.
Meta-cognitive	(M1) Evaluating	Comments about verification of some knowledge and skills.
	(M2) Reflecting	Comments telling the writer to reflect on or think about the work thoroughly.
Irrelevant comments	(IR)	Irrelevant to affective, cognitive and meta-cognitive comments.

The post-experimental stage was carried out after the competition. In order to make a data analysis, 18 students' first drafts, second drafts, the comments they received and related information of back evaluations were downloaded from *Peerceptiv* system. The process of data analysis is divided into two steps, including comments coding and implementation rate coding. The complete table of content analysis is shown in Table 1.

4. RESULTS AND DISCUSSION

4.1 Distribution of the peer-review comments

The first question of this study is what's the distribution of different types of peer-review comments. There is a total of 436 pieces of peer-review comments collected in this study, and they have been coded into three types according to the Cheng et al.'s (2015) classification. In order to show the distribution of different types of peer-review comments more clearly and visually, this part used the SPSS 22.0 to conduct a descriptive statistical analysis of the number of all comments after categorization. The specific data are shown in Table 2.

It can be seen from Table 2 that among the 436 comments, there are 28 affective comments, accounting for 6.4% of the total. The number of cognitive comments is the largest, accounting for 71.6%, with a total of 312. There are 93 meta-cognitive comments, accounting for 21.4%. There are 3 irrelevant comments, accounting for 0.7% of the total. Specifically, among affective comments, supporting comments are relatively more, accounting for 5.3% of the total. It

shows that reviewers tend to give positive feedback to their peers' compositions. Among the cognitive comments, the comments that give the specific suggestions (C3) account for a large proportion, accounting for 42.9% of the total. The second is the comments that directly point out the right and wrong (C1), accounting for 14.9%. The proportion of C2 which expresses personal views is the least, accounting for 13.8%. It is found that cognitive comments mainly comment on the use of vocabulary, grammar and sentence patterns. The reviewer will directly tell the writer how to change words or correct grammatical errors. Therefore, C3 comments account for a high proportion. Finally, among the meta-cognitive comments, the proportion of M1 comments (20%) is significantly higher than M2 (1.4%), indicating that the reviewers tend to evaluate the structure and views of the full text.

Table 2. The total number and percentage of the comments.

Category	Code	Number	Percentage
Affective	A1	23	5.3%
	A2	5	1.1%
Cognitive	C1	65	14.9%
	C2	60	13.8%
	C3	187	42.9%
Meta-cognitive	M1	87	20%
	M2	6	1.4%
Irrelevant comments	IR	3	0.7%
Total		436	100%

Generally speaking, students tend to put forward specific suggestions for revision of their peers' compositions, and they are more willing to make an overall evaluation of the structure and views of their peers' compositions than to express their personal feelings. The possible reason for this distribution is that students tend to give their peers specific suggestions, find out the obvious pragmatic errors in the compositions, and put forward clear solutions, which can help them improve the quality of the compositions.

4.2 Implementation rate of the peer-review comments

One Way ANOVA is used to investigate the differences of impact among different types of comments on implementation rate. In order to remove the influence of extreme values and maintain the reliability of the experimental results, this study excluded irrelevant comments in peer-review comments, determined that the Independent Variable of One Way ANOVA was seven categories of comments from A1 to M2, and the Dependent Variable was the implementation rate of comments. Before the analysis of variance, we need to test the homogeneity of variance. The test result is uneven variance. Therefore, please refer to the results of Tamhane method (assuming uneven variance), as shown in Table 3.

As shown in Table 3, the F value of variance significance test is 21.285, and the result of significance test is $p < 0.001$. The results show that the corresponding F value reached a significant level. Therefore, we can hold the view that there is a certain correlation between comments' types and implementation rate, and the comments' types have a significant impact on the implementation rate. In addition, Table 3 shows the scores of each comments' category in the implementation rate. Overall, the implementation rate of cognitive comments is the highest (M = 1.21), and the implementation rate of affective comments is the lowest (M = 0.5). To be specific, in the affective dimension, A2 > A1. It means the implementation rate of A2 is significantly higher than A1, which indicates that students are more inclined to adopt comments with negative opinions. In the cognitive dimension, C3 > C2. It indicates that the comments with specific modification suggestions are adopted more than those with personal views but no clear direction. In the meta-cognitive dimension, M2 > M1. It means that students' implementation rate of reflective comments is higher than that of evaluation comments.

In general, among the seven categories, the comments with clear modification suggestions in the cognitive dimension have the highest implementation rate. The reason for this result may be that in the cognitive dimension, reviewers will

not only point out the errors in peer composition, but also give specific solutions. These methods are quite easy for peers to understand and put into practice. Therefore, peers can adopt the suggestions of these comments and modify the second draft according to the content of the peer-review comments.

Table 3. One way ANOVA between types of comments and implementation rate.

Variables	**Implementation rate (Mean, SD[a])**	***F* (ANOVA) Scheffe Test**	
A1	(0.00, 0.000)		
A2	(0.50, 0.577)		A2 > A1
C1	(1.06, 0.772)		
C2	(1.12, 0.816)	21.285***	
C3	(1.45, 0.752)		C3 > C2
M1	(0.14, 0.516)		
M2	(1.00, 1.155)		M2 > M1

[a] Standard deviation. ***$p < 0.001$, the same below.

4.3 The effect of the peer-review comments on improvement rate

In this study, the writing performance of students is taking the writing grades as the standard of measurement. The submission grade is obtained by converting the average score of multiple peers into a hundred-mark system. The accuracy of its score has been recognized by many experts and scholars[10, 11]. In this section, the students' first draft and second draft scores are compared by paired sample *t*-test to study the impact of peer-review comments on the improvement rate of second draft scores. The specific results are shown in Table 4.

Table 4. Comparisons of draft 1 and draft 2 scores.

	Draft 1			**Draft 2**			*t*	Sig.
Writing scores	**M[a]**	**SD**	**S.E[b]**	**M**	**SD**	**S.E.**		(2-tailed)
	76.78	6.486	1.529	81.61	7.022	1.655	-2.404	0.028

[a] Mean; [b] Standard error.

As shown in Table 4, there is a significant difference (t = -2.404, Sig. < 0.05) between the grades of students' two drafts. The average grade of students' composition increased from 76.78 to 81.61, with an improvement rate of 6.3%. And the biggest change in writing grades is as high as 20 points. As a result, it can be concluded that peer review can help students improve their writing grades and have a positive impact on students' writing performance. The reason for this result may be that the opinions put forward by many peers are generally more persuasive than those of one person. When the errors in the writer's article are pointed out by many people, such comments will have higher reliability and are more conducive to the author's implementation, so as to improve the quality of the composition.

5. CONCLUSION

This study mainly summed up three major findings by investigating the distribution of different types of peer-review comments, the correlation between the comments and implementation, as well as their effects on students' writing performance. It not only enriched the relevant contents in the research field of peer review, but also provided empirical data for improving the application and development of online peer-review teaching model in English writing.

After more than one month of peer-review experiment, this study mainly draws the following three findings. Firstly, the distribution of each comment type is different. From the three dimensions of affective, cognitive and meta-cognitive, students received the most cognitive comments and the least affective comments, which shows that students are more inclined to give specific and objective suggestions of modification to their peers than expressing personal emotions, so as to help their peers better modify their compositions. Secondly, the implementation rate of different types of comments is also different. For the comments that give clear suggestions for revision in the cognitive dimension, the writer's second draft has the highest implementation rate, while the comments that express supporting views in the affective dimension have the lowest implementation. The result shows that comments with obvious modification suggestions are more conducive to learners' improvement of their own works, and comments with negative emotions can arouse learners' reflection more than the comments expressing positive meanings. Thirdly, by investigating the improvement rate of students' second draft, it is found that peer-review comments have a positive impact on the improvement of students' writing performance. After a round of peer review, the average score of students increased by 6.3%. It shows the effectiveness of peer assessment, which can be widely used in the practice of English writing teaching in China in the future.

However, there are still some backwards and limitations in this study. For example, the coding of peer-review comments is somewhat subjective, the number of research subjects is relatively small, and the coding scheme of comments is not comprehensive enough, as well as the short time of training. Therefore, the types and effects of peer-review comments in English writing can be further studied and analyzed.

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REFERENCES

[1] Nelson, M. M. and Schunn, C. D., "The nature of feedback: How different types of peer feedback affect writing performance," Instructional Science, 37(4), 375-401(2009).
[2] Dochy, F., Segers, M. and Sluijsmans, D., "The use of self-, peer and co-assessment in higher education: A review," Studies in Higher Education, 24(3), 331-350(1999).
[3] Yu, S. and Lee, I., "Peer feedback in second language writing (2005-2014)," Language Teaching, 49(4), 461-493(2016).
[4] Tsui, A. and Ng, M., "Do second L2 writers benefit from peer comments?," Journal of Second Language Writing, 9(2), 147-168(2000).
[5] Guerrero, M. C. M. D. and Villamil, O. S., "Activating the ZPD: Mutual scaffolding in L2 peer revision," Modern Language Journal, 84(1), 51-68(2000).
[6] Cai, J. G., "A comparative study of online peer feedback and teacher feedback on English writing of Chinese college students," Foreign Language, (2), 65-72(2011).
[7] Cheng, K. H., Liang, J. C. and Tsai, C. C., "Examining the role of feedback messages in undergraduate students' writing performance during an online peer assessment activity," Internet & Higher Education, (25), 78-84(2015).
[8] Van Der Pol, J., Van Den Berg, B., Admiraal, W. and Simons, P. R. J., "The nature, reception, and use of online peer feedback in higher education," Computers & Educations, 51(4), 1804-1817(2008).
[9] Xu, J. F. and Zhu, X., "A review of the research on Peerceptiv: A computer-assisted peer review system," Technology Enhanced Foreign Language Education, (2), 10-16(2019).
[10] Gao, Y., Zhang, F. H., Zhang, S. J. and Schunn, C. D., "Effects of receiving peer feedback in English writing: A study based on Peerceptiv Technology," Enhanced Foreign Language Education, (2), 3-9(2018).
[11] Bender, C., "A study of teacher and peer comments in the revision process of college writer," Dissertation Abstracts International, (2), 437(1989).