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The Impacts of Dialogic Interaction on Students' Engagement in Peer Assessment

The beneficial impacts of peer assessment to improve students' writing have been frequently reported. While students' engagement in the peer assessment process has been highlighted as a critical factor to enhance learning, few studies reported how to engage students. Although students' interaction has been advocated to let students participate in learning, it was found that previous studies of peer assessment only provided very limited opportunities for students to directly interact with each other. In this case study, 153 pre-service teachers were engaged in a group-based online reciprocal peer assessment learning activity to improve their academic writing skills. A core component of dialogic interaction was purposively implemented to foster engagement in the peer assessment process. Results suggest that while the students considered the process quite complicated and they needed more peer assessment training, they were seriously engaged in the process. The quality of students' writing was also found to have improved. The students appreciated the dialogic interactive feature of peer assessment to enhance their learning and they were satisfied with the instructional methods. This study highlights the importance of using dialogic interaction to improve students' engagement.

Keywords: peer assessment, dialogic interaction, engagement, academic writing

Introduction

Academic writing skill has been recognized as one of the significant competencies that undergraduates should develop (Smith et al., 1999). To enhance students' academic writing skills, peer assessment has been commonly used by lecturers since it enables students to learn from others and thereby improve their own writing skills (Topping, 1998). However, the effectiveness of peer assessment depends very much on students' engagement in the process (Cheng & Warren, 1997; Li et al., 2010; Topping et al., 2000; Wever et al., 2011; Xiao & Lucking, 2008). Students are required to critically review peer works, seriously provide feedback and carefully review feedback for improving their own work (Carless, 2020). However, students may not always behave as expected. A number of studies have reported that students demonstrated a negative attitude toward peer assessment and were not engaged in the process (Cheng & Warren, 1997; Topping et al., 2000; Venables & Summit, 2003). It is therefore critical to integrate some strategies to promote student's engagement in the peer assessment process. In this connection, literature has highlighted the importance of interaction in the process of assessment for learning activities (Kollar & Fischer, 2010). However, the degree of interaction between students in the existing studies (e.g. Cheng & Warren, 1997; Davies, 2006; O'Shea, Baker & Allen, 2007; Wever et al., 2011) was found very limited.

In our research, as an attempt to enhance interaction between students, we included dialogic two-way direct interaction as a core component of peer assessment to engage students. In recent years, academics have recognized the value of interaction in the format of two-way direct dialogue (Hill & West, 2020; Simpson, 2016). This paper reports a study that integrated a specific component of dialogic interaction in students' peer assessment and presents its effects on students' engagement.

Literature Review

Peer Assessment in Academic Writing

Assessment for learning has been advocated to enhance students' learning. Particularly, peer assessment with constructive feedback is one of the commonly used strategies that can encourage students to learn from each other and promote the ownership of learning (Leahy et al., 2005). Peer assessment encourages students to put more emphasis on their learning goals and become more involved in the assessment process. The beneficial impacts of peer assessment in learning in higher education and school settings have been well supported in the literature (Sebba et al., 2008; Topping, 1998).

Academic writing skill is one of the significant competencies that undergraduates should develop (Smith et al., 1999). To improve students' performance in the area of academic writing, many studies (e.g. Baker, 2016; Hill & West, 2020; Law & Baer, 2020) have been conducted using the intervention of peer assessment in the learning and teaching process. The results from these studies suggested that peer assessment, in general, can enable students to enhance knowledge of the subject matter, improve performance in academic writing and obtain a better understanding of the importance of peer review (see a meta-analysis, Huisman et al., 2019).

Student Engagement in the Peer Assessment Process

Although peer assessment improves students' learning, the success of peer assessment is based on the underlying assumption that students are willing to seriously participate in the whole process (Carless, 2020). Research has suggested that students who engage in peer assessment make more meaning-level changes to their writing than surface-level changes (Baker, 2016). However, students may demonstrate unsatisfactory performance due to negative phenomena of social processes, such as social loafing, the free-rider effect, diffusion of responsibility, and interaction disabilities (Salomon & Globerson, 1989). The students in some studies had reservations about participating, considered the process time-consuming

and uncomfortable (Cheng & Warren, 1997; Topping et al., 2000; Venables & Summit, 2003). In addition, in the study by Goldberg, Roswell, and Michaels (1995), students' peer response was unengaged, minimal and formulaic. The revisions made on the final texts were sparse and superficial.

Active engagement in the peer assessment process has been recognized as very important to enhance learning effectiveness (Cheng & Warren, 1997; Li et al., 2010; Topping et al., 2000; Wever et al., 2011; Xiao & Lucking, 2008). It is appreciated that different academics have shed light on the importance of active engagement in the peer assessment process for better learning. However, the question is how to encourage students to be more active and serious in the peer assessment process. It seems that these studies did not offer any workable solution. It is, therefore, critical to integrate strategies in peer assessment to engage students in the process. In regard to this, research has demonstrated that interaction among course participants significantly influences their learning effectiveness and satisfaction (Kollar & Fischer, 2010; Rust, 2007; Swan, 2001). Therefore, it is reasonable to infer that structured interactive learning activities for learner-learner interaction could be an effective agent of change to engage students during the peer assessment process for eliciting constructive and participative behaviours that enhance learning.

Interactive Features in Peer Assessment Studies

Although the interaction between learners is advocated, many studies in the literature can be found that used only one round of peer assessment to rate peers' work either for summative purposes without subsequent improvement (Alt & Raichel, 2020; Cheng & Warren, 1997; Davies, 2006; Law & Baer (2020); O'Shea et al., 2007; Wever et al., 2011) or formative purposes with improvement based on received feedback (Baker, 2016; Cartney, 2010; Gielen et al., 2010; Li et al., 2010; Naghdipour & Koc, 2015). A few studies have attempted to apply more than one round of peer assessment in the teaching intervention. For example, in the studies by Chen (2010), Kim and Ryu (2013), Lin, Liu and Yuan, (2001), Xiao and Lucking (2008), students were instructed to assess both draft and final versions of peers' work. Tseng and Tsai (2007) applied a three-round peer assessment. Students were required to assess the first, second, and final versions of their peers' projects for improvements.

As reflected in these studies, one round of assessment of peers' work is the prevalent practice for carrying out peer assessment. In this arrangement, students only have one occasion to express their comments on peers' work. Students are then instructed to improve their work according to the received

feedback for formative learning purposes; no follow-up action is required in the practice of summative peer assessment. The interaction between students is therefore very limited. Some studies attempted to increase the number of assessment occasions. However, almost all of these studies interacted in the manner of learner-content interaction in which they only provided feedback on peers' works in one direction. No direct interaction in the form of two-way academic dialogue was initiated among the students. The degree of direct interaction between learners was minimal. Table 1 summarizes the interactive features of some relevant studies.

Table 1. Interactive Features in Peer Assessment Studies

Study	Nature of Assessment	Occasion of Interaction	Object of Discussion in Interaction	Type of Interaction
Donia et al. (2021)	Summative	One round	Student work	L-C interaction
Heerden & Bharuthram (2021)			Student work	L-C interaction
Yao et al. (2021)			Peer feedback	L-L interaction
Alt & Raichel (2020)			Student work	L-C interaction
Bong & Park (2020)			Student work	L-C interaction
Fernandez-Toro & Duensing (2020)			Student work	L-C interaction
Law & Baer (2020)			Student work	L-C interaction
Zhou et al. (2020)			Student work	L-C interaction
Wever et al. (2011)			Student work	L-C interaction
O'Shea et al. (2007)			Student work	L-C interaction
Davies (2006)			Student work	L-C interaction
Cheng & Warren (1997)			Student work	L-C interaction
Day et al. (2021)			Formative	One round
Biango-Daniels & Sarvary (2020)	Student work	L-C interaction		
Gaynor (2020)	Student work	L-C interaction		
Stancic (2020)	Student work	L-C interaction		
Zhang et al. (2020)	Student work	L-C interaction		
Zong et al. (2020)	Student work	L-C interaction		
	Peer feedback	L-L interaction		
Baker (2016)	Student work	L-C interaction		
Naghdi-pour & Koc (2015)	Student work	L-C interaction		
Gielen et al. (2010)	Student work	L-C interaction		
Li et al. (2010)	Student work	L-C interaction		
Cartney (2010)	Student work	L-C interaction		
Stenalt (2021)	Formative	Two rounds		
			Peer feedback	L-L interaction
Zhan (2021)			Student work	L-C interaction
			Peer feedback	L-L interaction
Chen (2010)			Student work	L-C interaction
Xiao & Lucking (2008)			Student work	L-C interaction
Kim & Ryu (2013)			Student work	L-C interaction
			Peer feedback	L-L interaction
Lin et al. (2001)			Student work	L-C interaction
Yu (2021)	Formative	Three rounds	Student work	L-C interaction
Han & Xu (2020)			Student work	L-C interaction
Mercader et al. (2020)			Student work	L-C interaction

Remarks: Student work refers to essays, project reports, summaries of reading, lesson plans or video presentations in respective studies.
L-C interaction stands for Learner-Content interaction.
L-L interaction stands for Learner-Learner interaction.

Dialogic Interaction

In order to enhance students' engagement in the peer assessment process, we applied an instructional strategy with a core component of dialogic interaction in this study. The dialogic interaction refers to the two-ways direct dialogue between the assessor and the assessee about the quality of the work being assessed. The purposes are to provide multiple opportunities for the assessor and the assessee to negotiate meanings, correct any misunderstanding, explore knowledge, reflect on their own learning and gain additional insights into perceptions of the quality or accuracy of their feedback (Simpson, 2016). Indeed, many academics have emphasized that the feedback process should be designed in a two-way dialogic process between students so as to promote their engagement (Hill & West, 2020; Nicol, 2010). The underpinning rationale rests on the social constructivist interpretations of learning (Vygotsky, 1978). It stresses that feedback received from external sources must trigger inner dialogue in students' minds to maximize the effectiveness of feedback. It involves students actively decode information, internalize it, compare it with their own work to make a judgment and make improvements in future work (Nicol, 2010). In recent years, the research trend involving dynamic, interactive opportunities for dialogue in online learning has begun to emerge (Espasa et al., 2020; Simpson, 2016).

In consideration of the rationale stated in the literature, this study explored the effectiveness of a dialogic interaction component in the peer assessment process. Details of the strategy are elaborated in the Methods section. It aimed to provide multiple occasions of direct interaction between students in the peer assessment process so as to promote active engagement among students. This study attempted to explore the impacts of dialogic interaction on (1) students' engagement in the peer assessment process and (2) their performance on academic writing.

Methods

In this study, the researchers intended to obtain a more complete understanding of the research problems. A mixed-methods research approach was therefore applied (Fraenkel et al., 2012). The quantitative and

qualitative data were collected using a questionnaire and the record function in a wiki platform. Since this study aimed to investigate the behaviours of a specific group of participants, this study applied a case study approach of qualitative research to understand the case in-depth and in its natural setting (Fraenkel et al., 2012).

Context of the Study

A total of 153 preservice kindergarten teachers (148 females and 5 males) in four classes, aged about 18, were invited to participate in this study. They were taking the Information Technology in Education course taught by the first author in an Early Childhood Education Programme offered by a higher education institute in Hong Kong. Apart from learning information technology, the course also aimed to enhance student's academic writing skills. The controversial issues listed below were given to the participants.

- (1) A child's development in terms of creative thinking capability is inhibited by using information and communication technology.
- (2) A child's development in terms of social communication ability is inhibited by using information and communication technology.
- (3) Children are not secure when using the Internet.

They were required to critically discuss the issues and to submit group reports in Chinese (their first language) for assessment. Fifty per cent of their coursemarks were allocated to this learning activity. In each class, the students were divided into 6 groups. Each topic was assigned to 2 groups in a class to discuss on an interactive wiki platform.

Research Procedure

The first half of the course helped the students acquire the knowledge conducive to the writing task. To provide training on peer assessment to the participants, the first author elaborated the assessment criteria and engaged the participants to assess a sample report from the previous year. The participants were then required to prepare a draft group report. The dialogic interactive peer assessment was implemented in the second half of the course within a wiki environment. The process was comprised of six stages. The peer assessment was conducted in an anonymous setting. The students, in a unit of a group, reciprocally

engaged in the dialogic interactive peer assessment as shown in Figure 1.

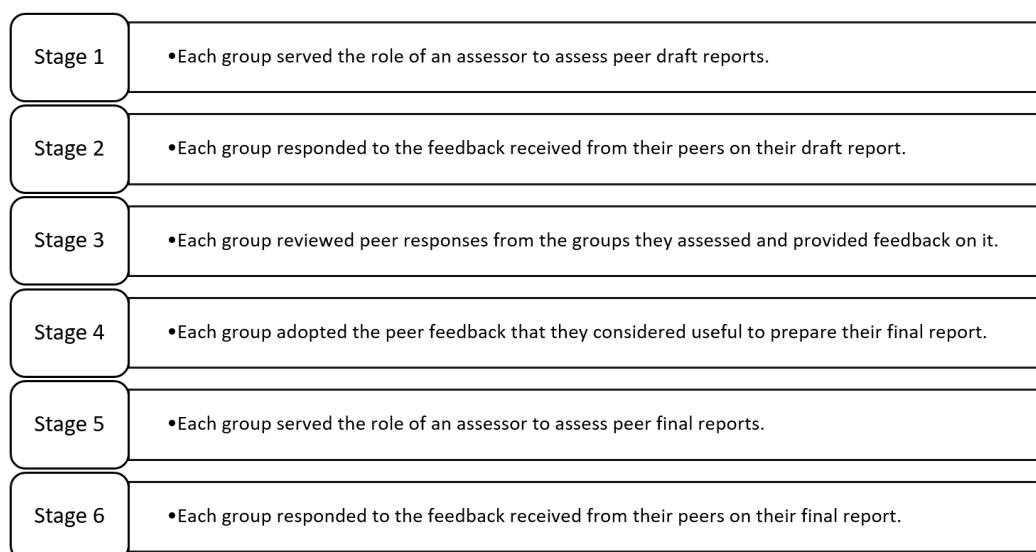


Figure 1. Six stages of dialogic interactive peer assessment

The dialogic interactive peer assessment was adapted from the interactive system suggested by Bretz and Schmidbauer (1983). Although the interactive system was published many years ago, this simple model of communication still holds great value and it was used in recent research (see, for example, Sharma et al., 2020). According to Bretz and Schmidbauer (1983), an interactive system must consist of three actions: (1) a statement, question, request, or other messages from communicant A to communicant B; (2) a response from B to A based on what A has just said; (3) a response or reaction from A to B based on B's response. Stage 1 to Stage 3 of the dialogic interactive peer assessment corresponds to the three actions of the interactive system. To enhance interactions, Stage 5 and Stage 6 that involved interactions to assess the final reports were included. In this design, students were engaged in multiple interactions. In addition to comment on peer reports, they were also required to engage in critical dialogues with peers. With this strategy, it was believed that students would be more engaged in the process and their writing skills could be improved.

In this study, the student's written reports were not marked by a teacher or a professional rater. The students were required to assess peer reports using the rubric for assessing students' academic papers adapted from Xiao and Lucking (2008) that includes criteria relating to the aspects of contents, organization and presentation, and use of references. The assessment marks given by the students on their peer group's draft and final reports were collected during the process using the wiki platform and subsequently analysed using paired sample t-tests to verify if there was any significant improvement in

students' writing. At the end of the project, a questionnaire adapted from Falchikov (1986) was used to investigate the students' engagement in the peer assessment process. Since our study intended to collect data similar to that in Falchikov's (1986) study, this questionnaire was therefore chosen. Indeed, recent studies (Bong & Park, 2020; Ng, 2016) also cited Falchikov (1986) to support their studies, in research design and interpretation of findings in relation to the peer assessment process. It reflects the value of the questionnaire (Falchikov, 1986) in the area of educational assessment.

According to the review conducted by Pedler et al. (2020), the concept of engagement includes behavioural, cognitive and emotional dimensions. Behavioural engagement involves "effort, persistence, attention, asking questions, participation, following rules, and the absence of disruptive behaviours" (p. 50). In the questionnaire (refers to the next section), items (i) and (j) were included to investigate the participants' behavioural engagement. Cognitive engagement refers to "investment in learning, self-regulation, preference for the challenge and hard work, going beyond requirements, effort in mastering new knowledge and skills and using learning strategies" (p. 50). Items (b), (c), (d), (f), (g) and (k) in the questionnaire aimed to explore the participants' cognitive engagement. Emotional engagement involves "affective reactions in the classroom, such as boredom, happiness, sadness and anxiety" (p. 50). The items (a), (e), (h) and (l) in the questionnaire examined the participants' emotional engagement. In addition, we included two open-ended questions to ask what they appreciated most and disliked most in this instructional design.

We looked at the descriptive statistics of the questionnaire data. To evaluate whether the means significantly deviated from the mid-point of the response scale, one-sample t-tests on mid-point value were conducted. For the comments received by the open questions in the questionnaire, thematic analysis was used to identify the themes emerging from these comments. Apart from the data from the questionnaire, the actual interactions among the students as recorded in the wiki platform were also reviewed for data triangulation.

Results

A total of 153 students participated in this study. One hundred and forty-five students completed the questionnaire. The response rate was about 95%.

Impacts on Students Engagement in Peer Assessment

In the questionnaire, the students were asked to rate the following impacts brought by the peer assessment learning method, using a 10-point scale (1 = *low level of impact*; 10 = *high level of impact*).

- (a) Willing to provide feedback
- (b) Critical in the peer assessment process
- (c) Aware of the quality of the report
- (d) Improvement in the understanding of the discussion issue
- (e) Confident in writing the report
- (f) Knowing how to write the report
- (g) Enhanced learning efficiency
- (h) Feel peer support in learning
- (i) Actively participating in learning activities
- (j) Seriously participating in learning activities
- (k) Considering the process challenging
- (l) Learning with enjoyment

The reliability check showed that the 12 items had a good internal consistency, with a Cronbach alpha coefficient of .958. The principal components analysis (PCA) using SPSS version 24 further confirmed this. Prior to performing the PCA, the suitability of the data for factor analysis was assessed. The Kaiser-Meyer-Olkin value was .94, exceeding the recommended value of .6 (Kaiser, 1974), and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the data. The PCA revealed the presence of one component with an eigenvalue exceeding 1 which can explain 68.6% of the variance. An inspection of the screen plot revealed a clear break after the first component. One component including all the 12 items was extracted.

The descriptive statistics of the responses are shown in Table 2, with the mean values ranging from 6.80 to 7.49. One-sample t-tests on the mid-value (5.5) revealed that all of the mean values were significantly higher than the mid-value 5.5 ($p < .001$). It indicates that the participants consistently expressed positive comments toward the dialogic interactive feature of the assessment strategy on all the 12 aspects listed in this questionnaire.

Table 2. Descriptive Statistics on the Dialogic Interactive Features of Peer Assessment

Impact	N	M	SD
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a	145	6.97	1.529
b	144	6.89	1.510
c	144	7.49	1.578
d	143	7.13	1.640
e	145	6.90	1.535
f	144	6.80	1.576
g	145	6.74	1.519
h	144	7.13	1.682
i	144	7.02	1.575
j	144	7.20	1.712
k	144	6.96	1.680
l	144	6.99	1.697
Valid N (listwise)	127		

(Remarks: $min = 1$; $max = 10$)

An open-ended question in the questionnaire asked the students what they appreciated most about the dialogic interactive peer assessment. The results obtained by thematic analysis of their responses are shown in Table 3. About 28% of the students appreciated the interactive peer assessment as it allowed them to learn from others. For example, they mentioned the following:

It enabled me to know the mistakes made by peers so that I could make improvements myself.

Moreover, about 25% of the students appreciated that the feature of dialogic interaction enhanced learning, as illustrated in the following example:

It enabled students to share their understanding so as to improve the quality of the reports and widen our thought.

Another 11% of the students stated that the dialogic interactive peer assessment enhanced learning effectiveness in general, as shown in the following example:

I developed a better understanding of the discussion issue.

In addition, about 10% of the students mentioned that the strategy promoted self-reflection. The following comment was mentioned:

It was highly appreciated that self-reflection on the possibility of making similar mistakes was initiated when assessing peers.

Furthermore, some of the students appreciated that their peers were very serious in the peer assessment

process (10%) and that the strategy allowed students to carry out progressive learning (5%). They also considered the anonymous assessment setting to be a good arrangement (5%).

Table 3. Most Appreciated Elements of the Dialogic Interactive Peer Assessment from Students’

Perspectives

Most Appreciated Element	Percentage of Student
Learned from others	28%
Enhanced learning by dialogic interaction	25%
Enhanced learning effectiveness in general	11%
Promoted self-reflection	10%
Participated seriously in peer assessment	10%
Assessed in an anonymous setting	5%
Learned progressively	5%
Unclassified	6%

On the other hand, we asked what they disliked most about the interactive peer assessment. About 33% of students mentioned that they disliked nothing. Another 32% of students highlighted that the instructional method was quite complicated. For example, they expressed that the method included many steps, took too much time and involved a lot of instructions. Besides, about 23% of students mentioned that they were not competent enough to assess peers. For example, they found it quite difficult to assess peer reports and provide constructive feedback, and the assessment might be too harsh or too lenient. Moreover, about 5% of students found peer assessment uncomfortable and 3% of students encountered a problem of collaboration within the group. The results are shown in Table 4.

Table 4. Most Disliked Elements of the Dialogic Interactive Peer Assessment from Students’ Perspectives

Most Disliked Element	Percentage of Student
Nothing disliked	33%
Complicated procedure	32%
Insufficient Peer Assessment Competence	23%
Uncomfortable feeling	5%
Problem of collaboration within group	3%
Unclassified	4%

We also asked the students’ opinions on their overall level of satisfaction with the dialogic interactive peer assessment, using a 10-point scale (1 = dissatisfied; 10 = satisfied). The results showed that the mean value was 6.94 (standard deviation = 1.42), higher than the midpoint of the scale (5.5). One-sample t-test, using the mid-value 5.5, showed that the mean value was significantly higher than the mid-value ($p < .001$).

Examples of Student Interactions

To explore in detail the students' engagement in the peer assessment process, we also reviewed students' actual interactions recorded in the wiki platform for the purpose of data triangulation. For example, the following comment was given by a group after assessing the draft report of their peer group.

The use of wording was not appropriate. The words "may" and "the majority" were frequently used. This made the arguments less affirmative. It is suggested that more affirmative wordings be used.

This comment was intended to enable the peer group to understand a problem in their writing, and a constructive suggestion was also provided. However, it was not accepted by the peer group. They responded very seriously to their peers' comments and provided reasons to support their rejection.

We accept that the words "may" and "the majority" were frequently used. We considered that the aim of the report is to discuss a controversial issue. No absolute view could be insisted on. Therefore, the word "may" reflects the nature of the discussion issue. Concerning the use of "the majority", since related references did not refer to the opinions of the whole population, we could not use absolute wordings.

Although the group who were being peer-assessed seriously defended their use of "may" and "the majority", the assessors seemed to be equally firm to maintain their views. The assessors replied:

We understand that the issue is controversial. However, we believe that our lecturer expects us to analyse this issue using our own views instead of using some public views or uncertain views in the analysis.

The actual final reports confirmed that these suggestions had not been taken into consideration. The students in this example seriously reviewed comments from peers and provided engaging responses.

In another example, students were assigned to discuss whether a child's development in terms of social communication ability is inhibited by using information and communication technology. In the peer assessment of the draft report, the assessing group provided the following comment.

A discussion on the general advantage of using information technology in early childhood education was included in the second last paragraph. It does not focus on the discussion issue. It is suggested to further elaborate on the advantage of using information technology to develop children's social communication ability.

The assessing group highlighted the problem of the relevance of contents in the draft report and suggested the direction of improvement. The group who were peer-assessed accepted this comment and responded as follows.

We accept this comment. We agree that we emphasized the general advantage of using information technology in early childhood education in the second last paragraph. We will improve the report to focus on the relationship between information technology and children's social communication ability.

As reflected by this response, the group who were peer-assessed not only positively accepted their peer's comment, they also explicitly stated that they would follow the suggestion to improve their report. With this positive response, the assessing group also provided the following feedback as a kind of positive reinforcement and appreciation.

Good! Please further discuss the relationship between information technology and children's social communication ability.

The group who were peer-assessed eventually adopted this comment to improve their final report. There were many examples of interactions between groups of either accepting or rejecting peer comments, which provides good evidence that the students were actively engaged in the peer assessment process under the dialogic interactive arrangement.

Improvement in Academic Writing

We also compared the marks given by the students to the draft report and the final report to investigate the effectiveness of the dialogic interactive peer assessment in enhancing students' academic writing performance. The students expressed their judgment on the quality of content, organization and presentation, and the use of references of peer reports using a scale of 1 (unsatisfactory) to 8 (very good). Statistically significant increases were found in the peer assessment marks given to all three aspects ($p < .05$). The mean marks increased from 3.76 to 5.67, from 4.16 to 5.81, and from 3.14 to 5.73 in content, organization and presentation, and use of references respectively. When we combined all three aspects for analysis of overall improvement, a large overall effect size ($\eta^2 = .81$) was observed.

Discussion and Conclusions

A critical issue of peer assessment is the degree of interactivity during the process to engage students for enhancing its effectiveness (Kollar & Fischer, 2010). This study explored the impacts of dialogic interaction on students' engagement in peer assessment. We found that the students appreciated the dialogic interactive feature of peer assessment to enhance their learning. They were more willing to provide feedback, more critical in the peer assessment process, more active and serious in the process. These results suggest that the dialogic interactive peer assessment had positively impacted the students' engagement in the peer assessment process. This finding echoes the observation by Swan (2001) and Rust (2007) that active interaction among course participants significantly influenced students' performance and satisfaction. Previous studies on peer assessment intervention (e.g., Chen, 2010; Venables & Summit, 2003; Xiao & Lucking, 2008) rarely reported strategies to make students more engaged in the assessment process. Our study, which incorporated specifically a dialogic interactive peer assessment strategy with a clear focus to enhance students' engagement during the peer assessment process, has demonstrated sufficient evidence of positive effects not only on learner's engagement in the assessment process but also the overall quality of their writings.

Although interactive features were incorporated in previous studies, many studies provided very limited opportunities to promote students' interaction and the interaction was in an indirect manner (see Table 1). Based on the dialogic interactive approach of peer assessment, the students in our study were provided with more opportunities for interaction: critical two-way dialogues to exchange feedback.

On the other hand, the dialogic interactive peer assessment improved students' academic writing skills which strengthens the findings in previous studies that used peer assessment to improve academic writing (e.g., Gielen, 2010; Hill & West, 2020; Xiao & Lucking, 2008). The findings also align with the finding of Gielen et al.'s (2010) study that performance improvement is related to the critical attitude of the assessee towards peer feedback. In addition, our findings further strengthen the argument that the effectiveness of students' learning is good if they are highly motivated in peer assessment activities (Lin et al., 2001).

Hong Kong is a city cultivated with Confucian heritage culture (Carless, 2011). One of the objectives of Confucian ethics is to encourage people to demonstrate proper conduct (Cua, 1998). Self-control, respect for others and yielding to others are considered the virtue of Confucian ethics (Li, 1997). It helps people avoid conflict and maintain a harmonious relationship with others. For example, Mayer et

al. (2016) found that Asians incline not to be over critical to express their views and they avoid giving responses at extreme ends of a scale. With this thinking in mind, Asian students may be more passive and obedient, and they are not expected to speak up in class (Carless, 2011). Since all the participants of this study were educated in Hong Kong, their behaviour might be influenced by their Confucian ways of thinking and not critical enough in peer assessment. However, critical dialogue among peers is important for learning in the peer assessment process. The researchers, therefore, arranged for the participants to exchange dialogue in written form, and in an anonymous setting. It aimed to reduce the negative feeling of directly exchanging oral feedback. As reflected by the results in Table 2 and the examples of interactions recorded in the wiki platform, the participants were seriously engaged in learning activities, willing to provide feedback and were critical in the peer assessment process. The positive effects of using an anonymous online peer assessment setting on students were also observed in Zhan (2021).

Another issue of peer assessment is the gender differences in the process of implementation. For example, in the study by Aryadoust (2016) with university students engaged in peer assessment of oral presentations, it was found that the scores given to the opposite sex were overestimated. Similar results were also obtained from the study by Falchikov and Magin (1997), female participants received higher marks in peer assessment of group work. Regarding the participation and emotional response in online assessment, the study by Cheng et al. (2014) suggested that both male and female participants demonstrated similar performance. Although gender differences is an issue that we should be aware of, it may not be a critical issue in our study since almost all the participants were females. Moreover, evidence has suggested that female students are inclined to provide higher quality argumentative feedback than male students (Noroozi et al., 2020). Therefore, it is unlikely that gender bias would negatively affect the results of this study.

Although the dialogic interactive peer assessment brought positive effects to the students, some students found this method of learning quite complicated. It implies that a well-planned procedure and clear instructions are important to secure the effectiveness of this method. On the other hand, a small number of students still encountered difficulties in assessing peers' reports even though the researcher enhanced their content knowledge and provided training on peer assessment. It reflects that more training in peer assessment is critical for the implementation of peer assessment since they were student assessors.

In our study, all the participants were students who took the same course taught by the first author. The duration of this study covered the whole period of the course. From the perspective of

research ethics, all students should undergo the same learning experience without any loss due to the implementation of research. Therefore, the design of this study could not have included any control group to ensure that no student was deprived of the learning opportunities. Therefore, we remain quite cautious when interpreting the findings of the positive impact on the improvement of the overall quality of writings as no comparison can be made. Besides, the improvement of academic writings identified in this study was based on the assessment marks given by the students. To improve the ability of students to conduct peer assessments, the students were trained to assess a sample report. The first author also provided further assistance to the students and closely monitored the peer assessment process. As Topping (2009) suggested, these kinds of arrangements are effective to improve the reliability of peer assessment. Moreover, although the students might be less competent in assessment, they worked as a group to assess peer reports of the same topic and they spent more time on it, which could improve the assessment reliability too (Topping, 2009).

Another commonly mentioned challenge of peer assessment is the issue of the social relationship between the assessor and the assessee. This factor may make students less objective and make it hard to avoid any personal prejudice. In our study, the students were requested to assess the reports from another class in an anonymous wiki environment. They did not know the assessors of their own reports and the authors of the reports they assessed. As suggested by Li (2017), the provision of an anonymous setting allows both parties to focus on the quality of the performance and it thereby improves the peer assessment processes. As reflected in the results of this study, the students expressed that they were more willing and more critical in providing feedback to peers. They appreciated the anonymous setting. The two-way dialogues recorded in the wiki environment also showed that the students were very critical in exchanging feedback. It suggests that the anonymous setting in this study improved the reliability of peer assessment. Notwithstanding these three potential limitations (i.e., without a control group, relying on marks from peer assessment, and social relationship), the results in this study evidence that the dialogic interactive peer assessment enhanced students' engagement in the peer assessment process and improved the overall quality of their academic writings.

On the basis of this study, it would be valuable to analyse the nature of feedback provided in the peer assessment process and how feedback is incorporated in the revised reports in the future. It would also be meaningful to investigate in detail the interaction between peer groups in the wiki platform. It should also be noted that this study investigated students' engagement in the peer assessment process

based on their interactions between groups. Future studies may further explore students' engagement within groups, for example, to understand how they reach their joint decision on what feedback should be presented to their peers. Moreover, researchers may design other approaches of peer assessment, with the inclusion of a comparison group, and compare them with dialogic interactive peer assessment. In addition, multiple surveys could be conducted to capture students' different aspects of engagement (behavioural, cognitive and emotional) during the whole process of peer assessment, to better reflect the multi-faceted nature of engagement. With continuous efforts from academics, the effectiveness of peer assessment could further be enhanced.

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