

Exploring EFL teachers' work engagement and students' perceptive interaction behaviours in online collaborative teaching

He Xiao*, and Kasma Suwanarak

National Institute of Development Administration, Graduate School of Language and Communication,
10240 Bangkok, Thailand

Abstract. The overarching objective of this study was to explore online learning effect of English writing combining teachers' teaching engagement with perceptive interaction behaviour of students. The Utrecht Work Engagement Scale (UWES) of online teaching and the questionnaire of perceptive interaction behaviours from students were adopted to find the appropriate participants in this study, and finally four teachers with different levels of work engagement (high vs. low) were selected and 100 undergraduates in university with Perceptive Oral Interaction (POI) and Perceptive Written Interaction (PWI) were verified, One-way ANOVA were used to check the homogeneity of variances ($p < .05$). Through the writing test scores, the two-way ANOVA was conducted to find whether the teachers' engagement (high vs. low) affects students' English writing learning, whether the types of perceptive interaction behaviours (POI vs. PWI) affect their English writing learning gains, and whether there is an interaction between teachers' engagement and types of perceptive interaction behaviours on their English writing learning. The results shows that there is a significant interaction between teacher's online work engagement and students' online behavioural perceptive interaction, and students with POI behaviour under the guidance of high work engagement from teachers yield higher learning gains than the other groups. However, the results also shows that students with POI got lower effect than students with PWI when they all met the teachers with low online work engagement, which need to be further studied in the future.

1 Introduction

Online collaborative learning (OCL) has become one of the accepted teaching approaches [24,7,20,5] since the technological development commenced, which refers to the learners and teachers working together, exchanging ideas and opinions, then developing a shared understanding of specific issues, and finally conducting the collaborative products [15]. The online teaching and learning had reached a peak in the university education along with the outbreak of epidemic and the intermittent situation of controlling policy enacted in China [6, 23, 25]. The outbreak of the COVID-19 led to the rise of emergency remote

* Corresponding author: 350080562@qq.com

learning as a prudent attempt to the measurement of crisis in university education. During the past three years of pandemic period, the OCL is not only the teaching itself, the mutual influence between teachers' emotions and students' emotions seems to arouse more attention in creating the collaborative online teaching. The sense could counteract students' emotions of loneliness when a direct interpersonal touch is lack in distance learning that is the most important component to decrease the distress [16]. Some factors influencing students' willingness to continue online learning during the COVID-19 pandemic are students' e-learning readiness, performance and satisfaction [18]. After the pandemic crisis, the OCL is bound to become the normalcy assisting the traditional class [5]. Hence, the consequences of the positive and negative emotions may take time to become fully apparent, but will potentially have strong impacts [13], the mutual emotional influence between teachers and students in OCL is key issue to research.

2 Literature review

2.1 Work engagement of teachers

Work engagement of teachers signify teachers' voluntary allocation of physical, cognitive and emotional resources in the process of teaching [12], and the cognitive physical engagement is the extent to which teachers able to invest effort in the workplace, while the emotional engagement is a key component teacher respond to the work positively. Work engagement can be defined as a positive, fulfilling, work-related state of mind that is characterized by vigour, dedication, and absorption [2]. Work engagement of teachers is directly related to the emotions of students teaching [22], such as the positive components of teachers affect the learning conditions and learning effect. Teachers can be equipped with a lot of energy and invest them into their work if they have high level of vigour, Combined with the dedication, teacher will be proud of their profession, feel enthusiasm and inspiration in the process of teaching, because they think their work is meaningful to the human beings. Even though work engagement is a relatively stable variable, since it has the characteristics of specific job presence and organization [14], the teachers' burnout and exhaustion significantly predict teachers' work disengagement [8]. Therefore, teachers with high work engagement and low engagement are significantly different in the learning gains.

2.2 Perceptive interaction behaviour of students

Perceptive interaction between teachers and students may relate to learning motivation, students' engagement, and academic achievement [1]. The frequent interaction between teachers and students is the bridge connecting virtual and real world. Perceptive interaction behaviour is dynamic, active and multi-faceted [9], it is the proper way to prevent online students isolation and dropout from the online classroom, the interaction between teacher and students play an vital role in the retention of online students [4].Collectively, teacher–student interaction has a significant impact on students' satisfaction and achievement in online learning [10]. Up till now, the liberalization of epidemic policies in China has been lifted, and the treasures of online teaching practical experience has been accumulated by many teachers and researchers during the past three years anti-epidemic network teaching. Furthermore, it would continue to influence the trend of future teaching and learning. However, most researches emphasis on the cognitive emotions of students, like learning burnout, self-efficacy, learning motivation and engagement, as well as teachers emotional support in online teaching [26], while the correlation study between teachers' engagement and students' perceptive interaction has not been robust up till now, which is little known

for everyone. Especially students' perceptive interaction has never been studied in the process of online teaching and learning, when the author is in the process of online teaching, it was found that some students liked communicating with teacher through oral interaction, they would like to open the microphone, interacted with teacher to discuss the problems they may come across, this type of interaction here can be called Perceptive Oral Interaction (POI) while some students are opposite way all the round, they weren't willing to open their microphone, only followed other classmates to write the answers or something relevant to the questions on the screen when the teacher asked question, this type of interaction here is called Perceptive Written Interaction(PWI). Previous studies mainly focus on teachers' engagement and students' achievements, like self-efficacy, online satisfactions, etc. However, the learning gains yielded from teachers' online work engagement and students' perceptive interaction behaviour, the interaction between teacher's engagement and types of perceptive interaction behaviour are litter known under the given study. So those issues need to be solved in this study.

3 Research questions

1. Can the online work engagement of teachers (high vs. low) affect the EFL writing learning?
2. Can the different types of perceptive interaction behaviour (POI vs. PWI) from students yield different learning gains?
3. Is there any interaction between teachers' online work engagement (high vs. low) and various types of perceptive interaction behaviour (POI vs. PWI) from students in the collaborative online writing learning?

4 Methodology

4.1 Participants

Teachers online work engagement is estimated by the adapted questionnaire of Utrecht Work Engagement Scale (UWES) (Bakker, 2022), including three parts like vigor (N=6), dedication (N=5) and absorption (N=6). The Crobach's coefficient alpha values for the three parts are 0.79, 0.89 and 0.82 respectively. The questionnaires were distributed to teachers randomly, and finally four teachers were selected according to the questionnaire results, including two teachers with high engagement, and two teachers with low engagement.

The questionnaire of perceptive interaction behaviour in online learning including two parts: Perceptive Oral Interaction (POI) and Perceptive Written Interaction (PWI), but the questions were organized disorderly. The Crobach's coefficient alpha values for the two parts are 0.76 and 0.87. Then the questionnaires were distributed to students randomly, and 100 participants were selected to take part in the next experiment. It worth mentioning that those participants were all the students of four teachers respectively who entered in the university in the first year, and they are mixed in gender (male or female), but homogeneity in terms of age, grade level and education background and learning experience ($p < .05$).

4.2 Material and pilot study

The material related to writing topics and writing techniques selected were new for students, so they have never known the content of it. In order to make sure the extent the participants unfamiliar with, the group of 20 participants (10 students with POI, and 10 students with

PWI) took part in the pilot study, and the questionnaire, interview, and observation would be adopted, the topics and relevant techniques that unknown up to 80% of the students were included in the final material.

Then two experienced teachers simplified and modified the material in terms of topics and writing techniques to cater to students' current proficiency level. Since those two teachers have the rich experience in English writing, so the reliability of the material can be assured. And the final simplified writing material including 4 topics and various writing techniques were finalized and used in the next experiment.

4.3 Procedure

On the one hand, 80 participants were divided into four groups to attend the writing class. On the other hand, four teachers were assigned to the different four groups. That is, POI and PWI groups will be divided into two parts, thus forming four groups: POI with High engagement (POI-H) group, PWI with High engagement (PWI-H) group, POI with low engagement (POI-L) group, and PWI with Low engagement (PWI-L) group. And one-way ANOVA conducted to ensure the homogeneity of groups at the "high" engagement, and homogeneity of groups at the "low" engagement. From the table 1, the Levene statistic showed that the engagement of POI and PWI is significantly different ($p < .05$), so the homogeneity of four groups can be assured.

Table 1. One-way ANOVA and homogeneity of variances.

Teacher Engagement					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18.100	3	6.033	241.333	.000
Within Groups	1.900	76	.025		
Total	20.000	79			

Then the experiment lasted five weeks, teachers taught the English writing with different teaching engagement in online class, and students interacted with teachers using their perceptive interaction behaviour. At the last week, teachers offered students the holistic review about the learning content for students, and let them strength what they have learned.

4.4 Data collection

Upon the completion of the online English writing learning and review, an immediate writing test was held for the four groups, the writing test included the different topics, but it asked students to write an accordance essay using the writing techniques they have learned. After collecting the test papers, two teachers with rich English writing teaching experience will rate the test papers. One teacher rated all of the test papers, while 30% of the test papers were randomly selected for the second teacher to rate, so the inter-rater reliability is supposed to be achieved. Any inconsistency was consulted to reach agreement in the final. And finally the test papers have been gone through by the first teacher and the final scores were got.

5 Results

After conducting the two-way ANOVA through the collected data, the results of interactions and relevant descriptive statistics can be reached finally. So the answers related to the previous three questions can be found in the following tables and figure.

Table 2. Descriptive statistics between teacher engagement and behavioural interaction.

Dependent Variable: Test Scores				
Teacher Engagement	Behavioral Interaction	Mean	Std. Deviation	N
High	POI	87.3000	5.55451	20
	PWI	76.3500	4.33195	20
	Total	81.8250	7.41062	40
Low	POI	66.0000	6.89011	20
	PWI	67.0500	7.56359	20
	Total	66.5250	7.16110	40
Total	POI	76.6500	12.42939	40
	PWI	71.7000	7.69349	40
	Total	74.1750	10.56837	80

From the descriptive table (Table3) showed that high Teacher Engagement (TE) with POI generated the highest mean scores than the other three groups (M=87.3, SD=5.6), the behavioural interaction with POI (M=76.7, SD=12.4) can got higher mean scores than PWI (M= 71.1, SD=7.70), whether the teachers engage in the teaching or not. However, there is one thing we need to notice, that is, the low teacher engagement with POI (M= 66.0, SD=6.89) yield the slightly lower mean scores than the low teacher with PWI (M= 67.1, SD=7.56), which need to be discussed in the future.

Table 3. Interaction between teacher engagement and behavioural interaction.

Dependent Variable: Test Scores						
Source	Squares	df	Mean	F	Sig.	Partial Eta Squared
Corrected Model	5891.850 ^a	3	1963.950	50.913	.000	.668
Intercept	440154.450	1	440154.450	11410.355	.000	.993
TE	4681.800	1	4681.800	121.369	.000	.615
BI	490.050	1	490.050	12.704	.001	.143
TE * BI	720.000	1	720.000	18.665	.000	.197
Error	2931.700	76	38.575			
Total	448978.000	80				
Corrected Total	8823.550	79				

a. R Squared = .668 (Adjusted R Squared = .655)

Table 4. Mean scores of teacher engagement and behavioural interaction.

Dependent Variable: Test Scores					
Teacher Engagement	Behavioral Interaction	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
High	POI	87.300	1.389	84.534	90.066
	PWI	76.350	1.389	73.584	79.116
Low	POI	66.000	1.389	63.234	68.766
	PWI	67.050	1.389	64.284	69.816

The ANOVA table (Table 5) told us that there was an interaction between teacher engagement and students’ behavioural interaction, $F(1,76)=18.67$, $p<.001$. Specifically, from the table 3, it can be seen that the effect of writing learning with POI was significantly different in high teacher engagement(M=87.3, SD=1.39) and low teacher engagement (M= 66.0,SD=1.39),while the effect of writing learning with PWI was similar in high teacher

engagement ($M=66.0$, $SD=1.39$) and low teacher engagement ($M= 67.1,SD=1.39$), and when teacher are the high engagement, there exists significantly different between POI ($M=87.3$, $SD=1.39$) and PWI($M=76.3,SD=1.39$), however, when students with POI ($M=66.0$ $SD=1.39$) is slightly lower than students with PWI ($M=67.1$ $SD=1.39$)when teachers are in the status of low engagement.

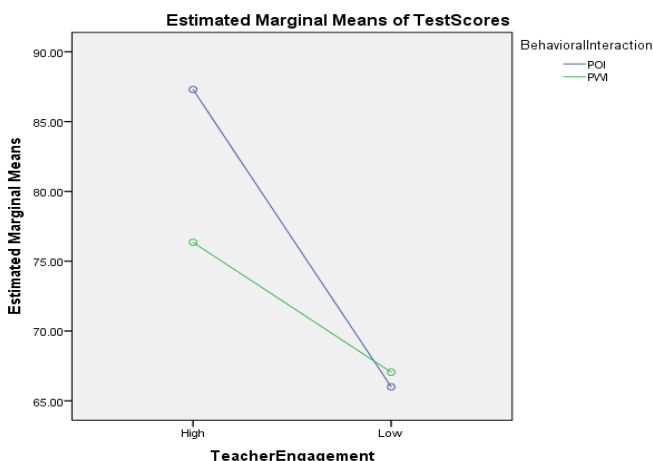


Fig. 1. Profile plot of teacher engagement *students’ behavioral interaction.

From the figure 1, we can see that Teachers with high engagement would generate higher learning effect than that of teachers with low engagement. And students with POI are all yield higher effect than students with PWI, whether teacher are in the high or low engagement. However, even though students with POI in the class, they got lower learning effect than students with PWI.

6 Discussion

The purpose of this study was to examine whether teachers’ online work engagement and students’ perceptive behaviour interaction yield different effect on ESL writing learning, and the interaction between them. The results verified that teachers with high online work engagement yield more effect on ESL writing learning whether students had different types of perceptive interaction or not. This finding is accordance with the previous studies, like teachers with high work engagement [11] who usually have more favourable characteristics, positive emotions, and higher job satisfaction, and lower job burnout, so they are willing to engage in the work of teaching that lead to the productive effect in the process of teaching.

At the same time, the result of students with high POI usually yielded much more learning gains in online collaborative learning, since students with perceptive oral interaction illustrates that they have the higher learning motivation and learning engagement which is another effective factor in the mutual relation between teacher and students [19]. If students learn with active learning practices, it will enhance their engagement and increase their critical thinking [3]. However, students with POI is only one necessary factor to achieve the learning effect, it usually needs the combination with teacher’s high online work engagement, the result showed that it may also lead to low learning effect if the teacher with low online work engagement. As for the students with POI got lower effect than students with PWI when they all met the students with low online work engagement, the author guess students have the practice of oral interaction with teachers, but teacher had low engagement for the one reason, and students may have the

low knowledge proficiency for another, so those two factors may lead to the phenomenon efficiency which need to be further studied in the future.

The final question related to the interaction between teacher's online work engagement and students' perceptive interaction behaviour is that students with POI under the guidance of teachers' high work engagement yielded the most learning gains in online ESL writing learning. So the combination between teachers work engagement and students perceptive oral interaction is a vital way to yield the best effect in the process learning, since learner's knowledge is no longer received passively by themselves. Instead, they are the active participants with high positive teachers to discuss in classroom through teachers' guidance. And these interactions help students become active and more engaged in their online courses [21], and finally Students' success in online learning is affected by their interactions with their teachers [17].

7 Conclusion and future research

The overarching objective of this study was to explore the the writing learning effect of teachers' online work engagement and students' perceptive interaction behaviour, and the interaction between them. The questionnaires about Utrecht Work Engagement Scale (UWES) of online teaching and students' perceptive interaction behaviour were adopted to estimate teachers' online work engagement and students' online interaction behaviour. Through the ESL writing test scores, the two-way ANOVA was used to check whether the teachers' engagement (high vs. low) affects students' English writing learning, whether the types of perceptive interaction behaviour affect their English writing learning gains, and whether there is an interaction between teachers' engagement and types of perceptive interaction behaviour on their writing learning. The results showed that there was a significant interaction between teacher's online work engagement and students' online behavioural perceptive interaction, and students with POI behaviour gained higher learning effect than that of students with PWI behaviour, and teachers with high engagement also yield more learning effect that that of teachers with low work engagement. And students with POI behaviour under the guidance of teacher's high work engagement were the best way to learn ESL writing. However, the results also showed that students with POI got lower effect than students with PWI when they all met the students with low online work engagement, which need to be further studied in the future.

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