

Peer Participation in a Tailored-Crossword Puzzle Activity for English Majors in China

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Abstract. Vocabulary teaching in an English as a Foreign Language environment can be painful and tedious. This paper adopted Tailored-Crossword Puzzle Activity (Shortened as TCPA) generated by the software for an exploration of vocabulary teaching to English major freshmen. This paper examines five dimensions of students' TCPA group competition: group discussion participated; helped keep the group on task; contributed useful ideas; the amount work was done; and quality of completed work. The results show that, in general, one's own participation is closely correlated to other group members' participation efforts. Meanwhile, the difficulty of a TCPA has to be carefully controlled with the consideration of time and vocabulary amount.

Keywords: Crossword puzzle; vocabulary teaching. English as an Foreign Language.

1. Introduction

To actively engage students in the learning process is crucial [e.g., 1, 2, 3], game and puzzles are effective methods [4, 5]. It is also claimed that games and puzzles facilitate important critical-thinking skills while reinforcing concepts taught in classes [6, 7]. Unfortunately, however, this kind of teaching activities are most popularly adopted in English as a second language (Hereafter refers to ESL) environment, while it is not known by most of the English teachers in an English as a foreign language (Hereafter refers to EFL) environment.

Vocabulary learning in an EFL environment can be dreadful and hard for many students in most of the situations. Not only students feel hard to memorize words, but also they have difficulties to apply them. Reading course is designed with different themes for English majors in China higher education to expand their vocabulary bank as one main focus. Meanwhile, its reading materials are long passages with great amount of advanced vocabularies which mainly rely on students themselves to memorize painfully. In China, students are required to acquire 5,500 to 6,500 words and 3,000 to 4,000 phrases by the end of the second year according to National English Language Curriculum for English Major issued in 2000. Students are expected to acquire 10,000 to 12,000 words and 5,000 to 6,000 phrases when they graduate from college. To most of the students and in many cases, the load of word memorization can be unpleasant, awful and inefficient. This is perhaps one of the reason that students know great amount of vocabulary in an EFL environment but without being able to understand English authentic texts and apply words properly in different contexts. Vocabulary is passively obtained in a too short time.

To solve this predicament of vocabulary memorization, in this study, students were required (a) to complete a tailored-crossword puzzle activity (Shortened as TCPA) cooperatively (b) to evaluate one's own and other group members' participation anonymously. The puzzle was created by the teacher (the author) in accordance with the corresponding reading textbook material. Particularly, this study focuses on the correlations of five dimensions (group discussion participated; helped keep the group on task; contributed useful ideas; the amount work was done; and quality of completed work) between one's self and other group members' participation of the crossword puzzles.

To this extent, this study is expected the more participation, the less memorization, and the more engagement in higher level thinking, the less repetitive work in an EFL teaching setting. Meanwhile, it aims to create relaxed classroom atmosphere for their improvement in communication skills, group interactions, or even the functioning skills in a society.

2. Literature review

2.1 Crossword puzzle practices in ESL class

In an ESL classroom environment, crossword puzzle has been adopted in higher education [e.g., 8, 9, 10] for motivation, interaction, efficiency, and innovation. For motivation, the possible early adoption of crossword puzzles in class can be found in 1974 by Carter, suggesting that crossword puzzles can be copied for the students or projected to overhead on board for a whole classroom activity. He also pointed out that crossword puzzles are essentially as an individual work. From the perspective of active learning in higher education, Crossman and Crossman conducted crossword puzzle activities in the course of the History of Psychology with pre- and post-tests results and survey, finding that the results are positive to increase students' scores, more importantly, students showed positive participation. Meanwhile, they suggested that this can be used to other courses as well under careful design. However, their analysis was based on 14 participants, not applicable to larger classroom settings. For interaction, Nicol explores a highly interactive classroom with students generating their own crosswords for a review of the chapters, content knowledge in the textbook, arguing that this activity could have the students engaged in the process of learning the textbook materials[11]. Mshayisa claims that the Plickers (a real-time, formative assessment) and crossword puzzles can be adopted as effective tools for students' active learning, particularly in an interactive classroom setting[12]. For efficiency of vocabulary learning, Lin and Dunphy compared the class of students with and without crossword puzzle assignment and found that the class with crossword puzzle assignment surpassed the other group in the microeconomic vocabulary terms [13]. For innovation of teaching, Weisskirch examines the instructor-created crossword puzzles as a vocabulary assessment through collaborative work in classroom teaching, and proposes this can be a feasible technique for the teacher[11]. Coticone argues that students' self-made crossword puzzles can be integrated into different disciplines as a simple and creative way. Yuriev, Capuano, and Short evaluated the development of the crossword puzzles in a technical scientific class, which demonstrates an improvement in the ability of students' problem-solving[14]. In can be seen that crossword puzzles could be effective tools for students to learn cooperatively, interestingly, efficiently. However, still, its application has not been fully researched, even in an ESL environment.

Therefore, very few proper studies have explored the use of crossword puzzles in an EFL environment. In viewing such benefits by adopting crossword puzzles in an ESL classroom, this paper explores its group participation contributions through the challenging of the tailored-crossword puzzle competition, particularly in an EFL environment.

2.2 Research questions

In order to promote active learning and classroom participation in an EFL setting, TCPA was designed with the vocabulary from the unit of reading coursebook. This paper is designed to answer these two questions by participating in TCPA.

- (1) Will the peer participation of TCPA be a difference between two equally adopted classes?
- (2) Is there any correlations between one's achievement and other group members' participation in the practice of TCPA?

3. Methods

3.1 Participants

English Freshmen (n=35+35) were equally distributed into two classes enrolled in the fall of 2019 academic semester at one of China's application-oriented university. The division of the two classes was equally distributed according to the enrollment score at the university.

3.2 TCPA

In this study, the word *tailored* refers that the crossword puzzle sheets are personalized by the teacher (the author) to assess the key words of the unit in their reading coursebook. The researcher (as well as the author) selected key vocabularies from three units of the required reading teaching

material, entering them into software *Eclipse Crossword* (many of other online crossword puzzle resources can also be adopted depending on the features) to generate crossword puzzle sheets. The generator produces two sheets for each unit: one sheet is the empty Crossword Puzzle sheet for students to complete; one sheet for key (refer to Figure 1 to see the sheets of activity 1). The teacher distributed students the empty sheet for accessing students' familiarity to the vocabulary in the unit.

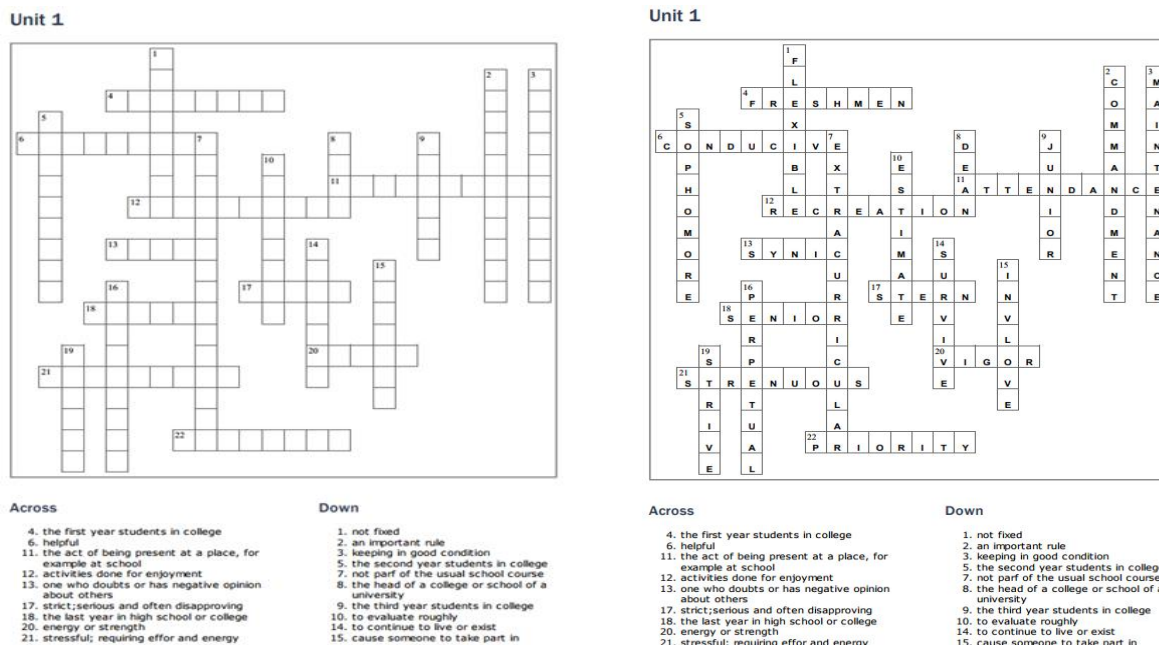


Fig. 1: Crossword Puzzle Empty and Answer Sheets for Activity 1

3.3 Research procedures

Step 1: At the beginning of the semester, the students were asked to form a permanent group of at least 4 students for the whole semester. Each of the group is made up with at least four to six members. In total, twelve groups were formed from two classes (each class formed six groups).

Step 2: During the semester, three tailored-crossword puzzle empty sheets were equally distributed in each class time for a cooperation work to accomplish competitively.

Step 3: By the end of the semester in the last class, questionnaire survey concerning peer participation and reflections were conducted in class time through the online questionnaire. In the evaluation, the teacher explained to the students the anonymous way of evaluation and students had to think of themselves and three of other members in mind (the three members were not explicitly identified for a fear of face-losing and fake-avoid evaluation) for an anonymous evaluation. In such a way, students was not afraid of criticizing by others or the teacher.

3.4 Survey design and collection

By the end of the semester, the teacher distributed the survey (See Appendix) concerning two parts: an anonymous evaluation of peer contribution and reflections to the participation of the activity. For the peer evaluation, there are five dimensions according to Chad Manis [15]: group discussion participated (hereafter as GD); helped keep the group on task (hereafter as HT); contributed useful ideas (hereafter as CI); the amount work was done (hereafter as WD); and quality of completed work (hereafter as QW). For each of the dimension, a 5-point Likert scale (1= weak, 5= strong) were asked to fill in.

At the same time, reflections to the activity participation includes 10 questions: 8 closed YES/NO questions and 2 open questions. The survey was distributed to each student through a website <https://www.wjx.cn/> and 64 copies were collected. Then, to answer the first research question, an Independent t-test between the two classes was conducted and the second research

question, a Spearman correlation of the four dimensions with one's own evaluation was conducted through SPSSAU.

4. Results

4.1 Group performance to the TCPA completion

Table 1 shows the results of the group performance in the participation of three TCPAs. The activities were completed in different time-limits for an adjustment of the difficulty level. Activity 1 was conducted without time limit, activity 2 within 15mins, and activity 3 within 10mins. It can be viewed that time influence the group performance greatly, which can be the factor in conducting the activity. Without time limit, the groups can complete the work correctly. In the observation for the activity 1, it took about 20mins for all groups finishing it. Viewing the time difference, the teacher set up 15mins for the conduction of activity 2. In the performance of activity 2, none of the groups completed the puzzle. Therefore, in activity 3, the teacher reduced the total number of vocabulary and shortened the time. However, the group performance did not improve, for some groups, even getting worse.

Table 1: Crosswords Puzzle Group Performance Result

Groups/ Activities	Class 1			Class 2		
	Activity 1 (without time limitation)	Activity 2 (within 15mins)	Activity 3 (within 10mins)	Activity 1 (without time limitation)	Activity 2 (within 15mins)	Activity 3 (within 10mins)
Group 1	22/22	18/24	13/19	22/22	17/24	15/19
Group 2	22/22	18/24	15/19	22/22	15/24	9/19
Group 3	22/22	15/24	15/19	22/22	15/24	10/19
Group 4	22/22	16/24	12/19	22/22	13/24	7/19
Group 5	22/22	19/24	14/19	22/22	20/24	8/19
Group 6	22/22	20/24	10/19	22/22	19/24	15/19

4.2 Survey results

4.2.1 Peer participation between the two classes

Peer participation survey results of the five dimensions between these two classes did not show great difference (See Table 2). In general, it can be assumed that the students' reaction to the participation of TCPA did not have significant difference. To this extent, the comparison of one's own and other group members' participation in the evaluation can be considered as valid.

Table 2: Independent t-test Analysis between the Two Classes

Independent t-test Analysis				
Class (Average±Standard Error)	Class 2(n=35)	Class 4(n=29)	F	p
GD(Self)	3.86±0.81	4.00±0.71	0.553	0.46
GD(M1)	3.83±0.86	4.10±0.77	1.783	0.187
GD(M2)	3.91±0.85	3.72±0.84	0.798	0.375
GDM3)	3.57±0.98	3.69±1.17	0.194	0.661
HT(Self)	3.89±0.76	3.79±0.62	0.278	0.6
HT(M1)	3.66±0.80	3.83±0.80	0.714	0.401
HT(M2)	3.57±1.09	3.83±0.97	0.967	0.329
HT(M3)	3.83±0.82	3.45±0.95	2.954	0.091
CI(Self)	3.91±0.78	3.69±0.85	1.212	0.275
CI(M1)	3.74±0.78	3.69±0.66	0.085	0.772
CI(M2)	3.63±0.88	3.72±1.03	0.16	0.69
CI(M3)	3.63±0.88	3.45±1.24	0.461	0.5
QW(Self)	3.71±0.83	3.79±0.90	0.133	0.717
QW(M1)	3.54±0.98	3.79±0.82	1.197	0.278
QW(M2)	3.60±0.81	3.90±0.94	1.836	0.18

QW(M3)	3.57±0.78	3.59±0.78	0.006	0.94
WD(Self)	3.74±0.89	3.76±0.69	0.006	0.938
WD(M1)	3.66±0.84	3.79±0.77	0.447	0.506
WD(M2)	3.60±0.98	3.72±0.88	0.28	0.599
WD(M3)	3.66±0.94	3.52±0.99	0.337	0.564

* p<0.05 ** <0.01

Note: according to SPSSAU, if the value marked with* and **, the relations are significant. If there is no such marks, it can be considered as no relation. The p value explained as under the mark of both * and **: 0.7 above: significant related; 0.4~0.7: closely related;0.2~0.4 weakly related. <https://spssau.com/helps/universalmethod/correlation.html>

4.2.2 Anonymous Evaluation of Peer participation

The Spearman Correlation of the five dimensions has been carried out to investigate the relations between one's own and the other group members' evaluation. In Table 3, the students' self-participation dimensions are significantly and positively related to the others' without exceptions. In the group activity competition, they have supported each other and formed positive relation. Also, it is notable that the results of two classes show a difference. For Class 1, one's own participation in each of the dimensions is significantly related to other group members'(all of the dimensions values has significantly related to others' discussion, work, contribution and quality of work). While in Class 2, a weak relation among them has been demonstrated. In Class 2, the results indicate self-amount of work completed did not show any relation with other dimensions (slightly related to other members' amount of work, p=0.40 and p=0.37), self-discussion is highly related to others' discussion (p=0.64, p=0.52, p=0.51) , contribution of ideas (p=0.48, p=0.44) and quality of work(p=0.48, p=0.48); self-contribution of the ideas is greatly related to group discussion (p=0.58, p=0.49), quality of work (p=0.56,p=0.47, p=0.53) and at least of one other member's (p=0.49); self-quality of work is heavily related to other group members' quality of work (P=0.52, p=0.70, p=0.51) and other one member's help (p=0.51) and idea contribution (p=0.48).

Table 3: Spearman Correlation between self and other group members

	Class 1					Class 2				
	GD (SELF)	HT (SELF)	CI (SELF)	WD (SELF)	QW (SELF)	GD (SELF)	HT (SELF)	CI (SELF)	WD (SELF)	QW (SELF)
GD(M1)	0.55**	0.62*	0.60**	0.37*	0.37*	0.64**	0.50**	0.11	0.31	0.34
GD(M2)	0.40*	0.58*	0.60**	0.38*	0.44**	0.52**	0.38*	0.58**	0.20	0.26
GD(M3)	0.65**	0.65*	0.60**	0.44**	0.44**	0.51**	0.28	0.49**	0.30	0.34
HT(M1)	0.55**	0.70*	0.70**	0.46**	0.36*	0.37*	0.57**	0.30	0.30	0.34
HT(M2)	0.49**	0.63*	0.59**	0.51**	0.40*	0.39*	0.62**	0.24	0.14	0.21
HT(M3)	0.59**	0.63*	0.60**	0.40*	0.51**	0.55**	0.47*	0.41*	0.35	0.51**
CI(M1)	0.61**	0.64*	0.58**	0.66**	0.78**	0.48**	0.60**	0.49**	0.33	0.48**
CI(M2)	0.57**	0.55*	0.65**	0.54**	0.58**	0.20	0.41*	0.41*	0.08	0.27
CI(M3)	0.47**	0.70*	0.62**	0.60**	0.64**	0.48**	0.44*	0.46*	0.30	0.28
WD(M1)	0.43*	0.67*	0.64**	0.62**	0.58**	0.31	0.63**	0.40*	0.40*	0.39*
WD(M2)	0.48**	0.59*	0.62**	0.65**	0.58**	0.23	0.51**	0.24	0.30	0.18

2)	*									
WD(M 3)	0.41*	0.53*	0.78**	0.47**	0.49**	0.47*	0.37*	0.30	0.37*	0.34
QW(M 1)	0.38*	0.48*	0.40*	0.59**	0.64**	0.43*	0.62**	0.56**	0.16	0.52**
QW(M 2)	0.41*	0.54*	0.77**	0.53**	0.49**	0.48**	0.44*	0.47**	0.28	0.70**
QW(M 3)	0.43**	0.59*	0.64**	0.56**	0.69**	0.48**	0.42*	0.53**	0.16	0.51**

* p<0.05 ** p<0.01

4.3 Students' responses

The closed YES/NO questions were in two perspectives (see Table 4): students' reflection to group contribution and students' reaction to puzzle activity. The students expressed that they all finished the activity on time and admitted that they did good job (98.9% of Q1). They supported each other during the activity (98.9% of Q2). They also shared and listened ideas together (100% of Q4). Sincerely, they have confessed that they did not use English entirely in the participation of the activity (67.1% of Q3.).

Table 4: Results for Closed questions

YES/NO Questions	Yes	No
Q1. We finished our task on time and we did a good job?	98.9%	1.1%
Q2. We encouraged each other and we cooperated with each other?	98.9%	1.1%
Q3. We used English in our communication?	67.1%	32.9%
Q4. We each shared our ideas, then listened and valued each other's ideas?	100%	0%
Q5. I like the group activity of word puzzle?	94.5%	5.5%
Q6. I did learn from the activity of word puzzle?	96.7%	3.3%
Q7. I still want to do word puzzle in class later?	94.5%	5.5%
Q8. I like group work?	96.7%	3.3%

Students' reaction to the participation of the puzzle activities was investigated from Q5 to Q8. Seen from the survey results, most of the students liked solving the puzzle through group efforts (94.5% of Q5) and they learned from it as well (96.7% of Q6). In general, the students expected to have such activity later (94.5% of Q7) and such group activities (96.7% of Q8). Even though the students showed their favorable response to such puzzle, it is noticeable that some of the students have expressed their anxiety in participation either due to the difficulty of the puzzle design or other reasons.

Table 5: Word frequency results for open questions

Q9: We did best at		Q10: we could improve at	
Key words	Frequency	Key words	Frequency
communication	15	oral English	12
cooperation	14	communication	14
finish the words puzzle	10	cooperation	8
discussion	6	finish puzzle	7

The two open questions are summarized mainly in Table 5 for Q9 and Q10. Even though students think they did best in communication, cooperation, finishing the word puzzle and discussion, they still think they could improve in these aspects, particularly they would like to improve their oral English, or speaking ability.

5. Discussion and Conclusion

In an EFL classroom setting, particularly in China, students are still reluctant to speak in class. Many language teaching methods have been introduced to China with little effect. In order to stimulate students to speak out, TCPA is aimed to encourage them to interact with each other. In the study, TCPA has demonstrated as an effective way for students to participate in classroom. However, Time and vocabulary can be one of the crucial factors to control the difficulty of the TCPA participation. Based on the performance results, as the time and vocabulary amount deducted, the students' accomplishments has been much influenced and their performance did not really get better. On the contrary, class time are always tight and precious. Therefore, the balance of time and vocabulary amount has to be carefully designed and balanced for better efficiency. For the future exploration, the adoption of difficulty can be adjusted through time-limit and the vocabulary amount.

To certain extent, based on the anonymous evaluation, it can be concluded that one's own performance overall is influenced by the other group members' discussion, work achievement, contribution, and quality of work. In other words, one's own participation is heavily rely on other's performance. In this participation of TCPA, most of the students worked cooperatively and closely. On the other hand, one's own participation can be vary in response to different class participation environment. In this study, the two classes of evaluation has a slightly different correlations in certain dimensions even there was no significance found in Independent t-test..

In conclusion, even though vocabulary can be memorized in other ways, classroom is still one important place for thoughts to spark and for students to be interactive. This paper explores a possible way of using TCPV in EFL classroom language teaching, which not only can be used as a practical and easy vocabulary practice, but also can be an assessment for teachers to get to know the students' efforts while reading. TCPV can be designed under the teacher's control for specific reading material. In this practice here, the students expressed that they have enjoyed the process solving the puzzle through group efforts. Personally, the author offers a feasible class activity for EFL teachers, not only for English majors, but also for different situation of English teaching depending on the teachers' teaching ability and skill.

This paper has limitations as well in two aspects: the anonymous evaluation was conducted just once and based on survey results mainly. For the former aspect, the data will be much more precise if the evaluation was conducted every time once after their completion of the TCPA. For the latter, with considering the face-losing problem, the students' evaluation could be not accurate. Meanwhile, the difficulty of the puzzle activity design was not really well-controlled. It is worth of more practitionary efforts for the future adoption of these activities.

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Appendix Quick Peer Evaluation Form

Name _____

Class _____

Group Members' names: _____

Assign yourself a value for each attribute. Afterward, do the same for each of your group members. Superior =5, above average=4, average=3, below average=2, weak=1.)

	Yourself	Member1	Member2	Member3
Participated in group discussions				
Helped keep the group on task.				
Contributed useful ideas.				
How much work was done?				
Quality of completed work.				

GROUP SELF EVALUATION CHECKLIST

- 1. We finished our task on time and we did a good job? A.YES B.NO
- 2. We encouraged each other and we cooperated with each other? A.YES B.NO
- 3. We used English in our communication? A.YES B.NO
- 4. We each shared our ideas, then listened and valued each other's ideas? A.YES B.NO
- 5. I like the group activity of word puzzle? A.YES B.NO
- 6. I did learn from the activity of word puzzle? A.YES B.NO

7. I still want to do word puzzle in class later? A.YES B.NO

8. I like group work? A.YES B.NO

9. We did best at _____

10. Next time we could improve at _____

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