

# **Peer Teaching as an Effective Method: A Case Study at ST University in China**

**Camilla Wang**  
**Shantou University**

**Jian Gao**  
**(Corresponding Author)**  
**Shantou University**

*Many studies have proved peer-teaching as a practical or best learning method. However, only a few practical and replicable classroom practices for teaching non-native English university students in China can be found. This article is intended to identify factors affecting ESL peer-teaching process and improve students' performance in all aspects of English skills. The data collected from questionnaires proves that peer-teaching is an effective teaching method for students to achieve a higher learning level.*

## **INTRODUCTION**

Traditionally, teacher-centered instruction and direct supervision have been the primary method of imparting knowledge to students (Munro and Elliott, 1987). However, college students are gradually less and less engaged in class for the reason that most university students are measured by self-reported cramming for exams (Beattie et al., 2018) or slight delays in course enrollment (Banerjee and Duflo, 2014; De Paola and Scoppa, 2015; Novarese and Di Giovinazzo, 2013). Additionally, researchers found that exogenous increases in distractions led students to study less and earn lower grades (Stinebrickner and Stinebrickner, 2008; Lindo et al., 2012).

Hopefully, there exists a trend that the direction of language teaching is changed from teacher-centered to student-centered, especially in contemporary English language teaching pedagogy (Leung and Spratt, 2000). Brown (1994) claimed that the best way to learn to interact in language learning is the interaction itself. From the beginning of language learning, classroom teaching should be interactive because language is acquired, not taught (Harmer, 1997). In this case, the peer teaching offers one approach to change study habits and improve student outcomes in higher education. As a studying and teaching strategy, peer teaching reduces students' communication anxiety, enhances their upbeat attitude, and improves their academic performance.

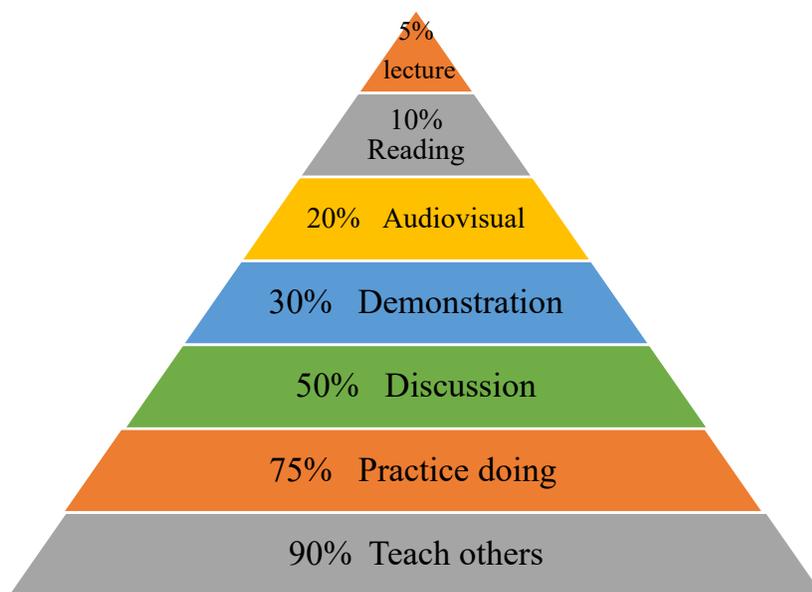
Most importantly, learning a second language is the best way to apply it as much as possible in class, while teaching provides a realistic opportunity. Even though a lot of studies have proved the effectiveness of peer teaching in a variety of settings ranging from clinical skills to preclinical medicine, basic resuscitation, and communication skills with encouraging results obtained (Nelson et al., 2013), there is still a long way to go to prove it in language learning. This research has conducted three questionnaire

surveys to test whether peer teaching is a practical English teaching method among more advanced college students.

## THEORETICAL BACKGROUND

The first published reports of students teaching students in situations planned and directed by their professors began to appear in the 1960s (Goldschmid and Goldschmid 1976). At that time, several peer teaching models, including discussion groups, student learning groups, the learning cell, and student counseling of students, have evolved. All these models have the exact nature to learn from someone at a similar level as yours. After all, the essence of language teaching is not to teach students the law of language itself but to create conditions and environments suitable for language learning to facilitate students' active use of language for communication (Benson, 1997). When some students wrestle with the process of organizing what they know and teach it to another, their depth and complexity of understanding are greatly expanded (Piaget, 1964). As the "cone of learning theory," the learning pyramid developed by the National Training Laboratory suggests that most students only remember 5% of what they learned from lectures but retain nearly 90% of what they learned through teaching others (see figure 1). The average retention rates (the key to gauging learning effectiveness) improve with more interactions and discussions.

**FIGURE 1  
THE LEARNING PYRAMID**



Source: National Training Laboratories, Bethel, Maine

Peer teaching, also known as peer tutoring, peer instruction, or peer-assisted learning (PAL), can be defined as the learning exchange. Students of similar backgrounds develop understanding by helping each other learn by actively sharing knowledge and experience and questioning different concepts and ideas. Its essence can be described as "learn by teaching," which was already popular in educational practices, such as group discussions (e.g., Webb, 1982), reciprocal teaching (e.g., Palincsar and Brown, 1984), and so on. "Learning by teaching" is derived from "to teach is to learn twice," which is allegedly from French philosopher Joseph Joubert (Whitman and Fife, 1988), regarding teaching as an effective method of learning.

Cate and Durning (2007) categorized forms of peer teaching into three dimensions: distance in the stage of education, the formality of the educational setting, and group size. Firstly, if teachers and students are in

an equal stage of training (or called same-age teaching, same-level teaching, or reciprocal teaching), this modality is called peer teaching, co-peer teaching, or same-year peer teaching (Cate and Durning, 2007). If a more advanced student teaches a lower-level fellow student, then he/she is a near-peer teacher. In this way, the modality is called near-peer teaching, cross-level teaching, or cross-age teaching (Topping, 1996). In either exchange, by placing learning in a collaborative and social context, students can share the experience of learning with their peers who will be, or have been, in similar positions and empathizing with the same challenges they encounter. Through cognitive congruence, they present concepts at a level of understanding geared towards student learners with a similar knowledge base (Lockspeiser et al., 2008). Secondly, the next dimension is the size of the group taught, including one-to-one peer teaching (or peer tutoring), peer teaching in small groups, and peer teaching applied in large groups (Cate and Durning, 2007). Thirdly, the formality of the teaching within the educational program has two extreme cases; in one severe case, the courtesy relates to peers informally preparing for tests together, rehearsing outside the school, or helping each other solve questions (Cate and Durning, 2007).

Peer teaching pedagogy started from Piaget's work, who advocated for socialization and collaboration as essential components of meaningful learning (Secomb, 2008). His cognitive development theory supports that the interaction between peers challenges the established norms and creates learner disequilibrium effectively (Piaget, 1965; Palincsar, 1998). In traditional classroom teaching, an activity in which students should engage would make learners feel a sense of obligation and constraint, thus reducing their motivation. In contrast, when learners interact with an equal peer, cooperation was founded (De Lisi, 2002).

Allen and Feldman (1976) linked role theory to peer teaching, which explains that students will learn from people of similar backgrounds (e.g., age) (Sarbin, 1976) since it suggests that little distance may be more effective than a considerable distance. Overall, a formal role as a teacher will boost the peer teacher's motivations and behaviors best (Cate and Durning, 2007). Related to role theory, self-determination theory (SDT) can also explain the importance of peer teachers' motivation. It suggests that intrinsic motivation is produced by three factors: competence, autonomy, and relatedness to significant others (Ryan and Deci 2000), which could stimulate the teacher to spend more energy in studying; it is also called "success breeds success" (Cate and Durning, 2007).

The effects of peer teaching have been widely adopted in anatomy teaching (Dunkin and Hook (1978), language teaching (Angelova et al., 2006), biology and chemistry courses (Chrispeels et al., 2019). For peer teachers, the role of the teacher may help develop confidence and motivation. Moreover, social psychology theory suggests that group expectations are effective in group members' roles (Cate and Durning, 2007). Benware and Deci (1984) found that the "learn to teach" group had better performance on higher-order conceptual understanding through experiments. Additionally, individuals gain cognitive benefits like a product of the preparation process before teaching. During the process, the mere expectation of being a teacher may change the way peers study the material (Bargh and Schul, 1980). Preparing to teach helps peers select and organize information from a lesson (Fiorella and Mayer, 2013). At that moment, peer teachers get involved in generative processing (Mayer, 2005, 2009; Wittrock, 1989), which is cognitive processing related to organizing the material into meaningful representation by integrating new and existing knowledge (Fiorella and Mayer, 2013).

Furthermore, teaching others to promote learning beyond only preparing to teach since the interactions with students would build a different learning stage (Bargh and Schul, 1980). The key to peer teaching is the element of cognitive and social congruence (Lockspeiser et al. 2008). Cognitive congruence represents the similarity in intellect and thought between teachers and students, which indicates that subjects would better understand what their peers have expressed (Rees et al., 2015). Peer teaching improves the learners' emotions, suggesting that the participants share a social congruence with the teacher.

For learners, peer teaching is effective in pedagogical, economic, and political outcomes. Firstly, pedagogical advantages include more active, interactive, and participative learning, immediate feedback, reducing anxiety with self-disclosure, and higher ownership of this process (Topping, 1996). Secondly, economic advantages would involve teaching more students more effectively with less staff time. Thirdly, political benefits include entrusting students with learning democratically, enhancing their self-regulation

ability (Topping, 1996). According to Vygotsky (1978), If a student already knows what is most effective, then we should fully understand and stimulate the distance learning between students; a distance represents the “zone of proximal development” since peers may sense this zone of proximal development much more quickly than content experts, who may not always understand the cognitive problems student experience when processing new information (Topping, 2005).

Generally speaking, peer teachers learn twice by teaching; for learners, they get individualized education, which can help overcome at-risk or disadvantaged learners’ anxiety when learning languages (Goodlad and Hirst, 1989).

## **METHOD AND RESEARCH PROCESS**

We conducted this research at ST University (STU), founded in 1981 as a comprehensive university jointly supported by the Ministry of Education, the Guangdong Provincial Government, and the Li Ka Shing Foundation. Over the past few years, ST University has distinguished itself from other universities in China under the English Enhancement Program’s auspices, which gave rise to the English Language Center (ELC), founded in August 2003. While inheriting the faculty from the former English Teaching Unit, the ELC has recruited half of its faculty from abroad and has taken on the responsibilities of English teaching for the entire campus community (about 7000 students), including English-major students and graduate students, within the newly designed curriculum of the university’s credit-bearing system. According to the English abilities and degrees, the students are divided into ELC foundation, ELC1, ELC2, ELC3, and ELC4. Each lecturer can teach three classes in the same semester.

We conducted our research in two separate periods within three ELC4 classes, respectively, during the spring semester in 2018 and 2020. In the founding year, the peer teaching program of the ST University comprised approximately 30 lessons. A lesson is herein defined as 45 minutes of a lecture or a seminar. The peer teaching program was gradually enlarged based on the Kern cycle because of students’ high participation rates and favorable evaluations. Needs analyses and assessments were performed using surveys, focus groups, or semi-structured interviews with students, subject coordinators, and lecturers. These ranged from courses highly focused on English education subjects, including listening, speaking, reading, and writing.

The working group of ST University coordinates all elements of the programs. It includes the organization of the tutorials and the content-based and didactical supervision, the peer teachers’ qualification, the evaluation of courses, and tutorials’ supervision. However, the peer teachers plan the contents finally discussed and specified in an individual meeting with the ST University’s scientific assistant at the tutorial’s forefront. Students who participated as peer teachers in the programs are voluntary. Interested students apply as peer teacher candidates. The student must fulfill the following requirements to become a peer teacher:

1. Successful completion of the curricular activity to which the tutorial is adjusted.
2. Shown interest in the subject of the tutorial.
3. Willingness to intensively prepare for the tutorial and a high motivation to teach and explain.
4. Proof of evidence for all required accomplishments up to the tutorial time within the scope of the own study.

Students can start as a peer teacher at any time of their study, yet earliest after completing the first preclinical semester, and continue until completion of the practical year. According to the research purpose and the progress, we designed three different questionnaires to collect the necessary data to conduct descriptive statistics analysis.

Questionnaire 1 was developed and distributed to the student who attended the spring semester class in 2018. Sixty-one students, 39 boys and 22 girls responded to the survey over the one-semester study. Questionnaire 2 was developed and distributed to the students who attended the spring semester class in 2020. Sixty-three subjects responded to the questionnaire version 2. Specifically, 44 students are boys, and 18 students are girls. Among the sixty-three subjects, 24 subjects are from class 1116285, 25 subjects are from class 116286, and the rest (13 subjects) are from class 116287.

The secondary data was collected from different documents by reviewing secondary sources. The unit of analysis in this study is the ELC4 students at ST University. It is worth mentioning that students took classes through the Internet. Explicitly speaking, peer teachers interacted with learners with PPT, videos or sound recordings, etc. After the first survey, more items were added to questionnaire 2 to measure students' feelings and opinions more all-around. After informing participants, 62 responses were approved to be used in this survey. This questionnaire was designed to measure their attitudes toward peer teaching, its strength in their opinions, the comparison between peer teaching and traditional teaching, their thought of being a peer teacher, their psychology, and their observation in the process. 90.3% of the participants are sophomores, 4.8% are freshmen, 3.2% are juniors, and 1.6% are seniors ( $M_{age}=20.29$ ).

We developed and distributed questionnaire 3, a supplementary to questionnaire 2, to the students who attended the spring semester class in 2020 at the end of the semester. This questionnaire is an open-ended survey to request the students answer three things they like most about peer teaching. We collected 61 valid questionnaires to make a content-based analysis. The design of the questionnaire version 2 uses a Likert 5-point scale to indicate the detail of the subjects' attitude strength. The content of the questionnaire version 2 adds. The design of the questionnaire version 2 uses a Likert 5-point scale to indicate the detail of the subjects' attitude strength. The content of the questionnaire version 2 adds a lot of items about subjects' thoughts and implementation situation of peer teaching progress.

## FINDINGS AND DISCUSSION

This research found that peer teaching is an effective method for ELC 4 students at ST University, getting the majority involved. Specifically, it is not only welcomed by peer teachers but also enjoyed by listeners. Peer teachers had a better understanding of the subject they taught, so they achieved the situation of "learning by teaching." For listeners prefer discussing or communicating with those at a similar level. In a word, all of the teachers and the students can get promoted in their English learning. It is worth mentioning that the premise is that the peer teacher is voluntary and capable of being the teacher.

Most importantly, peer teaching is different from self-study. It needs the control and negotiation of the class teacher. In the second and third study of this research (i.e., questionnaire 2), we conducted online courses, which proved that even if students are not in the face-to-face classroom and are more inclined to get disrupted, the peer is still effective and can even attenuate the shortcomings of online teaching.

**TABLE 1**  
**RESPONSES ON FEEDBACK IN QUESTIONNAIRE 1**

(Expressed as percentage of total population, unit: %)

	Yes	No
Do you think peer teaching is an effective method	93.33	6.67
Do you have an interest in peer teaching	88.89	11.11
Are you involved in peer teaching and the subsequent performance	97.78	2.22
Do you have a lesson plan for peer teaching	71.11	28.89
Whether materials including text, video, handouts, etc. beyond those provided in the course folders	82.22	17.78
Whether the presentation was balanced among group members & all seemed familiar with the content	82.22	17.78
Do you have an active participation	80	20
Does peer teaching have academic performance improvement	80	20
Do you enjoy the process while preparing the lesson with your group members	82.22	17.78
Do your group leader involve you in active participation	93.33	6.67

Table 1 reports students' responses to peer teaching, including their attitudes towards this method and the participation in the teaching procedure. These data indicate that most participants (93.33%) thought peer teaching is an effective method, and almost everyone (97.78%) got involved in it. As a near-peer teacher, 93.3% of the leader could involve students in active participation (80%), and 71.11% of them had a lesson plan for peer teaching. During the preparation, 82.22% of the peer teachers could gather materials including text, video, and handouts beyond those provided in the course folders and balanced presentation among group members. All seemed familiar with the content. Overall, 82.22% of subjects enjoyed the process while preparing the lesson with your group members.

According to table 1, most participants got involved in peer teaching and considered it an effective method. Simultaneously, fewer students were interested in it and got a lesson plan when preparing for teaching. The feedback above indicates that not every student has the motivation to be a teacher given to personal situations. Even though some peers had become teachers, they would not have full qualifications or thorough teaching preparation. So, peer teachers should be voluntary and selected before teaching, which means that the basic requirements of being a near-peer teacher are appropriate and compulsory for the teaching effects.

**TABLE 2  
RESPONSES ON FEEDBACK**

(Expressed as percentage of total population, unit: %)

	1	2	3	4	5
2. I prefer discussing/communicating with those at a similar level.	1.6	3.2	11.3	50.0	33.9
9. I enjoyed the process of peer teaching because I can learn better and make friends easier.		8.1	21.0	45.2	25.8

(1=strongly disagree; 2=disagree; 3=undecided; 4=agree; 5=strongly agree)

These items concern the attitudes of participants during the peer teaching process. The majority of the students (83.9%) prefer discussing or communicating with those at a similar level; in other words, most students like peer teaching. Most students (71%) enjoyed the process of peer teaching because it is a good way of making friends. In summary, Table 2 indicates that communicating with people at a similar level is more prevalent among students because they are more inclined to make friends during this process.

**TABLE 3  
RESPONSES TO OPINIONS**

(Expressed as percentage of total population, unit: %)

	2	3	4	5
5. Peer teaching has improved my motivation in English learning.	4.8	17.7	51.6	25.8
6. Peer teaching has improved my academic writing ability.	6.5	17.7	53.2	22.6
11. I have an overall improvement in the ability of critical thinking and independent learning, research skills, cooperation with team members, oral presentation and writing reading skills, etc.	3.2	12.9	59.7	24.2
15. The dual identity of a student and a teacher enabled me to study at a deeper level.	3.2	17.7	54.8	24.2
17. I think peer teaching triggered most students' interest.	3.2	16.1	50.0	30.6

(1=strongly disagree; 2=disagree; 3=undecided; 4=agree; 5=strongly agree)

Table 3 indicates that most students thought peer teaching improved their motivation (77.4%) and academic writing ability (75.8%), as well as the ability (83.9%) related to critical thinking, independent learning, research skills, cooperation, oral presentation, and writing reading skills and so on. Specifically, 79% of the students believed that both teachers and students could make them learn better. Peer teaching promoted not only their motivation but also most students' interest. In level 4, academic writing is an integral part of English learning; this improvement is not as good as those in other parts. Given that most undergraduates don't have educational writing experience, it is more suitable for advanced near-peer teachers to get in charge of this part.

**TABLE 4**  
**RESPONSES TO THE COMPARISON BETWEEN PEER TEACHING AND TRADITIONAL TEACHING**

(Expressed as percentage of total population, unit: %)

	2	3	4	5
13. Compare with the passive listen to the lecturer, I find myself more active in participating in the learning process and learn more.	1.6	19.4	51.6	27.4
14. I was more motivated to speak in peer teaching compared to traditional classroom teaching.	3.2	29.0	41.9	25.8
16. I have obtained more knowledge through peer teaching compared to traditional learning.	4.8	16.1	53.2	25.8

(1=Strongly disagree; 2=disagree; 3=undecided; 4=agree; 5=strongly agree)

Table 4 shows that 79% of the students were more willing to participate in peer teaching than passive listening to the lecturer. The same as students who argued that they had obtained more knowledge through peer teaching. Simultaneously, fewer of them (67.7%) were willing to speak in peer teaching (vs. traditional schooling). Students seemed more motivated in peer teaching and learning, while it is noticeable that supervisors should control the teaching effects both before and during this process.

**TABLE 5**  
**RESPONSES AS A PEER TEACHER**

(Expressed as percentage of total population, unit: %)

	1	2	3	4	5
7. I am interested in becoming a peer teacher.	1.6	14.5	32.3	35.5	16.1
8. As a peer teacher, I would make sure that I had enough knowledge to deal with other people's questions.		3.2	14.5	50.0	32.3
10. I have a better understanding of the subject I taught.		3.2	12.9	51.6	32.3
12. I was more motivated to learn and explore more on the subject I teach.		1.6	12.9	53.2	32.3

(1=strongly disagree; 2=disagree; 3=undecided; 4=agree; 5=strongly agree)

As table 5 shows, over half of the subjects (51.6%) were interested in becoming peer teachers. As peer teachers, 82.3% of the subjects believe that they would make sure that they had enough knowledge to solve students' questions. After preparing, 83.9% of the peer teachers understood the subject they taught, and 85.5% were more motivated. Like questionnaire 1, the figure of interest rate is not as significant as other items, so it is essential to put them in the right place; in other words, the essential requirement of becoming a peer teaching is necessary.

**TABLE 6**  
**RESPONSES TO THE PSYCHOLOGY**

(expressed as percentage of total population, unit: %)

	2	3	4	5
3. I gained more confidence to speak in English in the class and outside the classroom since I started to participate and talk in English with group members with ease.	1.6	14.5	54.8	29.0
4. During the teaching and presentation time, I found myself not so nervous and enjoyed it since I had been the peer teacher.	3.2	21.0	50.0	25.8

(1=strongly disagree; 2=disagree; 3=undecided; 4=agree; 5=strongly agree)

Table 6 shows that most subjects (83.8%) thought they gained more confidence to speak English with peer teaching; 75.8% of them became less nervous during this process. Confidence is fostered by peer teaching, which is beneficial to students' strengths.

In the observation of most participants (82.2%), peers performed well as a teacher; the learning atmosphere was stronger than before (item 19, 79%). Most students served well as peer teachers though the interaction atmosphere should be promoted in distance teaching (see Table 7). Most students (83.9%) regarded peer teaching as an effective learning method (see Table 8).

**TABLE 7**  
**RESPONSES TO PARTICIPANTS' OBSERVATION**

(Expressed as percentage of total population, unit: %)

	2	3	4	5
1. Peers performed well in the role of a teacher.	1.6	16.1	53.2	29.0
18. Under the peer learning method, the learning atmosphere in the classroom is stronger.	4.8	16.1	53.2	25.8

(1=strongly disagree; 2=disagree; 3=undecided; 4=agree; 5=strongly agree)

**TABLE 8**  
**RESPONSES TO THE OVERALL EVALUATION OF PEER TEACHING**

(expressed as percentage of total population, unit: %)

	2	3	4	5
21. I think peer teaching is an effective method of learning.	1.6	14.5	50.0	33.9

(1=strongly disagree; 2=disagree; 3=undecided; 4=agree; 5=strongly agree)

We made a content-based analysis according to the responses to questionnaire 3. Among all the answers, twenty-three students mentioned peer teaching as one of the three favorite things in the class. Most students thought peer teaching helps them acquire a lot of knowledge and understand it better (followed paragraphs are three samples):

*Peer teaching and group work. Because this can help us to learn the knowledge by ourselves and facilitates the development of the ability of teamwork.*

*First of all, it is our Peer Teaching Project. Work in small groups according to the content of the exam. Because we want to be a teacher, to teach the students, we must learn to understand the knowledge and consolidate the understanding of the exam.*

*Second is peer teaching; when conducted peer teaching, I acted as a teacher and share my knowledge with other students; it helps me learn and understand the ability and passes on knowledge to other people, which makes me feel delighted.*

It should not be ignored that some participants mentioned an advantage of peer education that was not mentioned in the literature. Some answers emphasized the reflection function of peer teaching:

*As for the peer teaching part, I learn how my classmates think about the essential points of what we learn. From this aspect, I can reflect on some of my shortcomings, and timely know what factors I am different from my classmates, and timely change them. Therefore, it plays a vital role for me to correct my shortcomings.*

The last strength of peer teaching that participants more frequently mentioned is the exchange function, including exchange roles, experience, and ideas or skills:

*Secondly, peer teaching is an opportunity for us to exchange roles that we students can be the teacher to teach other students. In this term, I have a joint in the vocabulary group. To teach the other students how to learn a new word quickly, I learned a lot about the root method. Meanwhile, the root method also benefits me when I learn vocabulary.*

*Peer teaching is a fun way to learn and share knowledge. The learning exchange in which students of similar backgrounds develop understanding by helping each other understand by actively sharing knowledge and experiences and questioning different concepts and ideas. Through my classmates' and classmates' courses, I learned and mastered this new way of learning.*

*The second thing is peer teaching. This part can help students exchange ideas or skills to answer the questions and the exam.*

Taken as a whole, the advantages of peer teaching are not only lie in promoting self-study compared with traditional education, which enables students to gain more knowledge at a deeper level and in a more relaxing way, but also in the reflection (or test) and exchange function which are unusual among other teaching methods.

## **CONCLUSION AND SUGGESTIONS**

This study reports two surveys that measured students' attitudes, psychology, and peer teaching evaluation during English learning at a university in China. More specifically, it finds out that the students got more motivation and involvement in the relaxed and pleasant atmosphere since they were more willing to ask peers and understand each other's thinking more efficiently, including empathy and problem identification (Morey et al., 1993). Besides, it approves that peer teaching has an advantage in improving students' encouragement (Pugatch and Wilson, 2018). Overall, most students had a good evaluation of peer teaching, and it seemed to be an effective teaching method for autonomy. Also, the effect of peer teaching largely depends on students' English levels. While it is worth mentioning that even though not everyone wants to be a peer teacher, most subjects would get more involved in learning the related material and thus obtained more confidence and enjoyment through it.

The outcomes of the three questionnaires suggest that not neglecting supervisors who should supervise the peer teachers' teaching effects and assure them understand the teaching objectives and process smoothly in their teaching practice. Whether in face-to-face teaching or distance teaching, interaction is still an essential part of learning; peer teachers should not ignore the audience's participation. Therefore, teachers

allocate more time to listen to feedback and fully prepare to answer learners' questions. Moreover, peer teaching can be an excellent tool to test advanced peers' levels and let them reflect on their shortcomings.

Future research needs to prove the effectiveness of peer teaching despite the self-report feedback compared with traditional classroom teaching. Using the experiment, speaking, listening, reading, and writing in the experiment group are predicted to be higher than the control group. Furthermore, the participants in prior surveys are all in level 4. Thus students in other English levels should be included in subsequent studies.

## ACKNOWLEDGMENTS

Dr. Jian Gao is the corresponding author (jgao@stu.edu.cn). Thanks to Miss Yuhan Ou, a graduate student at Central University of Finance and Economics, and Miss Chanyuan Gong, a graduate student at ST University, for their participation in the project and contribution to the paper.

## REFERENCES

- Angelova, M., & Gunawardena, D., & Volk, D. (2006). Peer teaching and learning: Co-constructing language in a dual language first grade. *Language & Education: An International Journal*, 20(3), 173–190.
- Banerjee, A.V., & Duflo, E. (2014). (Dis) organization and success in an economics MOOC. *The American Economic Review Papers and Proceedings*, 104(5), 514–518.
- Bargh, J.A., & Schul, Y. (1980). On the cognitive effects of teaching. *Journal of Educational Psychology*, 72, 593–604.
- Beattie, G., Lalibert, J.W.P., & Oreopoulos, P. (2018). Thrivers and divers: Using non-academic measures to predict college success and failure. *Economics of Education Review*, 62(1), 170–182.
- Benson, P. (1997). *Autonomy and Independence in Language Learning*. London, UK: Longman.
- Brown, H.D. (1994). *Teaching by principles*. New Jersey, USA: Prentice Hall Regents. Inc.
- Cate, T.O., & Durning, S. (2007). Dimensions and psychology of peer teaching in medical education. *Medical Teacher*, 29(6), 546–552.
- Chrispeels, H.E., Chapman, J.M., Gibson, C.L., & Muday, G.K. (2019). Peer teaching increases knowledge and changes perceptions about genetically modified crops in non-science major undergraduates. *CBE-Life Sciences Education*, 18(2), 1–14.
- De Lisi, R. (2002). From marbles to instant messenger: Implications of Piaget's ideas about peer learning. *Theory Into Practice*, 14(1), 5–12.
- De Paola, M., & Scoppa, V. (2015). Procrastination, academic success, and the effectiveness of a remedial program. *Journal of Economic Behavior & Organization*, 115, 217–236.
- Dunkin, E.N., & Hook, P. (1978). Peer teaching: An alternative to lectures. *British Journal of Occupational Therapy*, 41(8), 280–281.
- Fiorella, L., & Mayer, R.E. (2013). The relative benefits of learning by teaching and teaching expectancy. *Contemporary Educational Psychology*, 38(4), 281–288.
- Goldschmid, B., & Goldschmid, M. (1976). Peer teaching in higher education: A Review. *Higher Education*, 5(1), 9–33.
- Goodlad, S., & Hirst, B. (1989). *Peer Tutoring: A Guide to Learning by Teaching*. New York, NY: Nichols Publishing.
- Harmer, J. (1997). *The Practice of English Language Teaching*. London, UK: Longman Group.
- Leung, B., & Spratt, M. (2000). Peer teaching and peer learning revisited. *ELT Journal*, 54(3), 218–226.
- Lindo, J.M., Swensen, I.D., & Waddell, G.R. (2012). Are big-time sports a threat to student achievement? *American Economic Journal: Applied Economics*, 4(4), 254–274.
- Lockspeiser, T.M., O'Sullivan, P., Teherani, A., & Muller, J. (2008). Understanding the experience of being taught by peers: The value of social and cognitive congruence. *Advances in Health Sciences Education*, 13(3), 361–372.

- Mayer, R.E. (2005). *Cognitive theory of multimedia learning. The Cambridge handbook of multimedia learning* (pp. 31–48). New York, NY: Cambridge University Press.
- Mayer, R.E. (2009). *Multimedia learning* (2nd ed.). New York, NY: Cambridge University Press.
- Nelson A.J., Nelson S. V., & Linn, A.M., Raw, L.E., Kildea, H.B., & Tonkin, A.L. (2013). Tomorrow's educators... today? Implementing near-peer teaching for medical students. *Medical Teacher*, 35(2), 156–159.
- Morey, R.E., Miller, C.D., & Rosén, L.A., & Fulton, R. (1993). High school peer counseling: The relationship between student satisfaction and peer counselors' style of helping. *School Counselor*, 40(4), 293–300.
- Munro, P., & Elliott, J. (1987). Instructional Growth through Peer Coaching. *Journal of Staff Development*, 8(1), 25–28.
- Novarese, M., & Di Giovinazzo, V. (2013). Promptness and academic performance. *MPRA Paper* (45008).
- Palincsar, A.S. (1998). Social constructivist perspectives on teaching and learning. *Annual Review of Psychology*, 49(1), 345–375.
- Palincsar, A.S., & Brown, A.L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction*, 1(2), 117–175.
- Piaget, J. (1964). Part I: Cognitive development in children: Piaget development and learning. *Journal of Research in Science Teaching*, 2(3), 176–186.
- Piaget, J. (1965). *The moral judgment of the child*. New York, NY: Free Press.
- Rees, L., & Quinn, P., Davies, B., & Fotheringham, V. (2015). How does peer teaching compare to faculty teaching? A systematic review and meta-analysis. *Medical Teacher*, 38(8), 829–837.
- Ryan, R.M., & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78.
- Secomb, J. (2008). A systematic review of peer teaching and learning in clinical education. *Journal of Clinical Nursing*, 17(6), 703–716.
- Stinebrickner, R., & Stinebrickner, T.R. (2008). The causal effect of studying on academic performance. *The BE Journal of Economic Analysis & Policy*, 8(1), 1868–1868.
- Topping, K.J. (1996). The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. *Higher Education*, 32(3), 321–345.
- Topping, K.J. (2005). Trends in peer learning. *Educational Psychology*, 25(6), 631–645.
- Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: MIT Press.
- Webb, N.M. (1982). Peer interaction and learning in cooperative small groups. *Journal of Educational Psychology*, 74(5), 642–655.
- Wilson, N., & Pugatch, T. (2018). Nudging study habits: A field experiment on peer tutoring in higher education. *Todd Pugatch*, 62, 151–161.
- Whitman, N.A., & Fife, J.D. (1988). *Peer teaching: To teach is to learn twice*. Washington, DC: Association for the Study of Higher Education.