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# Developing an effective three-stage teaching method for collaborative academic reading: Evidence from Chinese first-year college students

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ABSTRACT

Collaboration has been found to facilitate comprehension of challenging academic texts. Following the Collaborative Strategic Reading (CSR) model implemented in primary and secondary school classrooms, this researching EAP practice paper detailed the development of a three-stage teaching method to facilitate Chinese first-year college students' comprehension of research articles. The three-stage teaching method consisted of individual reading, group discussion, and collaborative reflection. Drawing on the discussion and interview data from one of the reading groups, this study revealed their comprehension processes and collaborative use of strategies activated by the three stages. Specifically, results showed that the students prepared themselves for collaboration at the first stage, successfully constructed meaning collaboratively at the second stage, and modified their comprehension at the final stage. Implications and limitations of the three-stage teaching method for collaborative academic reading are also discussed.



## 1. The context

Research has suggested that collaboration can facilitate comprehension of academic texts, because it can help students share their understanding and clarify their confusion (Hirano, 2015). Collaborative reading is especially beneficial for college freshmen, as progressing from high schools to EAP classrooms poses many challenges (Ohata & Fukao, 2014). For example, college freshmen tend to find the lack of content knowledge particularly challenging (Hirano, 2015), because they have to apply content knowledge to understand academic discourse, the "difficult content in English" (Ohata & Fukao, 2014, p. 88). In addition, "discursive conventions of academic writing" and "domain-specific vocabulary" (McGrath, Berggren, & Mežek, 2016, p. 153) may also create difficulties for college students to comprehend academic texts. Moreover, non-native English speakers may face additional language challenges as they tend to struggle with unknown vocabularies for text comprehension (Hirano, 2015).

Research has also shown that reading strategies can promote meaning construction and facilitate reading comprehension (Follmer & Sperling, 2018). However, most studies have centered on strategies used in individual reading, and few studies have focused specifically on collaborative use of reading strategies. The small number of studies on collaborative use of

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reading strategies (e.g. Boardman, Boelé, & Klingner, 2018; Vaughn et al., 2013) have focused on the efficacy of Collaborative Strategic Reading (CSR) in primary and secondary language or reading classrooms with little attention paid to the college EAP context. Boardman et al. (2018) found an increase of student talk in discussing the text in middle school English language arts lessons that implemented the CSR model compared with those without it. They concluded that student talk and strategy use promoted comprehension. In a synthesis of CSR research, Vaughn et al. (2013) found that comprehension improvement in lessons with CSR, as measured by students' achievement in reading tests, exceeded that of those without CSR. These studies manifest the benefits of group discussions in facilitating reading comprehension.

To help first-year EAP students improve their comprehension of academic texts through collaboration in small groups, this study develops a three-stage teaching method based on the CSR model, which "combines … reading comprehension strategy instruction and cooperative learning", and guides students to "appl[y] four reading strategies to facilitate their comprehension of content area text" (Klingner & Vaughn, 1999, p. 739). The stream of research following the CSR model explicitly teaches students to apply strategies before, during, and after reading in "small student-led heterogeneous groups" (Boardman et al., 2018, p. 176). However, as Brevik (2019) points out, despite the merits of explicit strategy instruction, daily practices of known strategies tend to be more beneficial to improving students' comprehension than explicit teaching of new ones. Given the lack of classroom observation studies on strategy instruction (Brevik, 2019), there is a need for research that explores students' natural and authentic strategy use in reading classrooms. This research is crucial to developing more effective strategy instruction to improve students' reading comprehension in EAP classrooms. Different from the structured discussion and explicit teaching of strategies in the CSR model, this study intends to develop a three-stage teaching method that elicits naturally occurring reading strategies in small group collaboration, and to examine the efficacy of this method through analyzing the effectiveness of the strategies it evoks.

## 2. The issue

The four strategies that the CSR model teaches students to apply are: (a) "preview" (before reading); (b) "click and clunk" (during reading, to identify and use fix-up strategies to resolve comprehension problems); (c) "get the gist" (during reading); and (d) "wrap-up" (after reading, to reflect on what was learned) (Klingner & Vaughn, 1999, p. 739). Following these strategies, we organized our teaching procedures into three stages to guide college freshmen through collaborative summarization of journal articles: (a) individual reading, in which students were asked to make predictions about the article and decide the division of labor for reading; (b) group discussion, which required students to work in groups to comprehend and summarize the article, and write an outline to prepare for a presentation; (c) collaborative reflection, which required students to give an outline-based presentation and encouraged them to collaboratively reflect on the presentation task through rating others' presentations and revising their own outlines (see Fig. 1). Details about the teaching method and related materials/support at each of the three stages are presented in Section 3.3.

To develop an applicable teaching method that cultivates students' ability to collaboratively employ effective strategies in academic reading, we examined the efficacy of the three-stage teaching method through analyzing the naturally occurring reading strategies it evoked and explored ways to improve the method through collecting students' feedback and suggestions. Following the literature (Oxford, 2017; Thomas, Rose, & Pojanapunya, 2019), we defined reading strategies as the actions students adopt in collaborative reading with "some degree of consciousness" for the purpose of summarizing the texts (Thomas et al., 2019, p. 10). Two research questions were put forward to guide the study:

(1) Did the three-stage teaching method effectively activate strategies that facilitate comprehension of the academic texts? If so, what were they and how were they utilized to promote comprehension?
(2) What were the limitations of this method perceived by students?

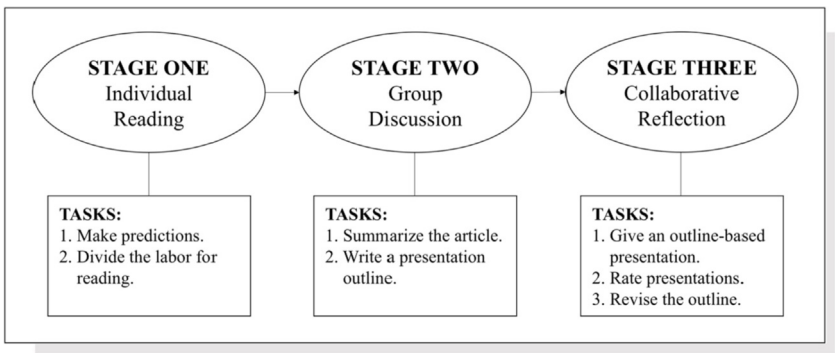


**Fig. 1.** The three-stage teaching method.

## 3. Implementing the innovative teaching method

### 3.1. Course overview

The three-stage teaching method was developed for the course *Academic English: Reading to Present*, which aimed to introduce first-year non-English majors to features and conventions of journal articles, cultivate their collaborative strategic reading capacity, and improve their ability to summarize academic articles in both oral (i.e. presentations) and written forms (i.e. outlines). All non-English majors participated in a placement test at the beginning of the first academic year and those who displayed outstanding performance were enrolled in this course. Thirty-six students majoring in mathematics took the course. They were divided into 6 groups to accomplish several summarization tasks collaboratively.

### 3.2. The collaborative reading group

A group of six students (S1−S6) participated in this study, with one male and five females. They were invited in this study because of their active participation in group collaboration observed in the first four weeks of the semester.

### 3.3. The three-stage teaching method

Participants were required to read four research articles collaboratively to produce summaries in both oral and written forms throughout the semester. These articles were research reports published in *Science* over the past five years. They were selected according to the rankings of the received altmetric attention scores in different subjects. The popular ones were selected and adapted by using the online text adaptation tool (Jin & Lu, 2018). The length of the texts was shortened with annotations of some difficult vocabularies added to assist students' reading. Each article was divided into three sections for students to read respectively (i.e. the "question" section, which introduces the research background, the "data" section, which illustrates the methodology, and the "answer" section, which presents the findings). The summarization task of each article was organized into three stages: individual reading, group discussion, and collaborative reflection.

#### 3.3.1. Individual reading

At the individual reading stage, two types of supporting materials were provided prior to reading: a cover letter and a notes template. We first guided the whole class to read the cover letter together, which included editorial notes and abstract of the research article, as an attempt to familiarize them with the main idea of the article and offer them clues for predicting the content to be read. The notes template provided a guide for the information that students needed to extract from the "question", "data", and "answer" section, respectively. To complete the template, students in each group divided among them the tasks of reading the article. Following the worked-out labor division, they started reading individually for 10 min, with possibly 1−2 students reading the question section, 2−3 reading the data section, and 2 reading the answer section.

#### 3.3.2. Group discussion

After individual reading, students started a group discussion for 10 to 15 min to collaboratively construct the meaning of the text through information sharing and elaboration. To better engage students in group discussion, we provided them with clear instructions: first, each group should formulate an outline of the article; second, after discussion, one student from each group will be randomly invited to give a 2-min presentation to summarize the content of the article based on the outline. In the process of discussion, students were expected to apply various strategies to fill in the information gaps to foster their collective comprehension of the article.

#### 3.3.3. Collaborative reflection

Subsequent to the group discussion, the invited representative from each group wrote their outlines on the blackboard and gave their presentations. Two kinds of supporting materials were provided at this stage: peer assessment forms for the summarization presentation, and a paper cut into three pieces for the outline revision. During the presentations, students rated speeches given by other groups using the assessment forms. They were expected to listen attentively because they would be randomly invited to interpret the speeches. After the presentations, each group had another discussion to revise their outline. Students were encouraged to compare their outline with those provided by other groups on the blackboard, and rewrite their outline on the three small pieces of paper for the convenience of collaboration (e.g. two people working on one third of the outline). The outlines would be pieced together by the teaching assistant, and at the beginning of the next class, students would receive a copy of three most outstanding outlines, with each drawn from one of three classes the first author taught. In this process, students were expected to learn from exemplar outlines and improve their own.

### 3.4. Data collection and analysis

To address research question one, we recorded the discussions by the six students to capture naturally occurring strategies employed in labor division and collaborative meaning construction of the articles at the first and second stage. The original outlines formulated at the second stage for presentation and the final revised outlines completed at the third stage after

presentation were also collected. We then interviewed the students to further understand their strategic behaviors manifested in the three stages. To address research question two, we conducted interviews with the students to investigate the limitations of the teaching method perceived by them and elicit their suggestions for improvement.

The discussion recordings, each lasting 10–15 min, were transcribed and coded using the coding scheme developed by two researchers through adapting the taxonomies of strategies found in the literature (e.g. McGrath et al., 2016; Oxford, 2017), and adding emergent categories found in the data. The coded transcripts were examined by a third researcher to ensure accuracy. The 12 interviews (two with each member of the group), ranging from 30 to 100 min, were transcribed and analyzed thematically to address the second research question and triangulate the discussion data.

## 4. Reporting on the practice

The study revealed that the three-stage teaching method elicited from students an array of cognitive and metacognitive strategies to make sense of the texts collaboratively (see Fig. 2). In the individual reading, the group strategically allocated each of the three sections of a text to a member, but some members took the initiative to read extra sections as the course progressed. In discussions, group members raised questions and answered them through elaboration and reasoning, which facilitated their understanding of the text. They also orchestrated their use of strategies to handle communication breakdowns and monitored their comprehension before presentation. At the reflection stage, they modified their comprehension of the text in view of other group's presentations and improved the formatting of their outline by recourse to outlines from other groups.

### *4.1. Collaborative preparation through individual reading*

At the individual reading stage, the focal group formed a fixed pattern of labor division for reading. They strictly followed it in the beginning, but over time some competent readers started to read extra sections.

#### *4.1.1. Fixed labor division for reading*

Overall, the group tended to adopt a fixed pattern of labor division for the individual reading task, with the same two students reading the question, data, and answer section, respectively. Students reported in interviews that the division of labor was decided based on their abilities. For example, the data section, considered the longest and most difficult, was always assigned to S3 and S5, because they were seen as proficient and fast readers. In particular, S3, the leader of the group, was often sought for help from other members in later discussions. Interestingly, each time before reading, they tended to predict who was most likely to be invited as the presenter. As S4 reported, that student would read the question section, because it contained important information about research purposes, from which one could better learn the basics of the research than from the data or the answer section. With supplementary information provided by others who read the data and the answer section, the student could effectively develop an overall understanding of the article. This arrangement indicated the use of metacognitive strategy—planning for the task—to prepare the presenter for oral demonstration.

#### *4.1.2. Reading extra sections*

Despite the established pattern of labor division, fast readers S2, S3, and S5 started to read other sections after finishing reading the one assigned to them as they became increasingly familiar with the reading tasks. Reading extra sections facilitated their comprehension of the text and fostered meaning construction in follow-up group discussions. For example, in

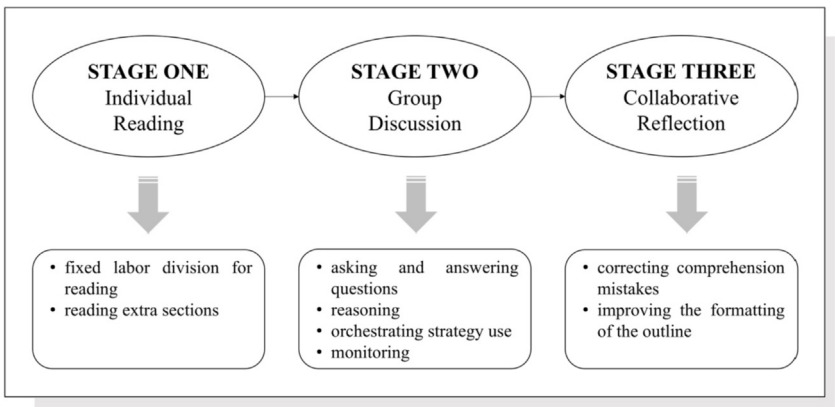


**Fig. 2.** Strategies activated by the three stages.

some cases, where both students failed to fully understand the section they were assigned to read, the whole group remained confused until someone who read two sections (one assigned, one extra) offered elaboration.

To sum up, following the fixed pattern of labor division did not seem to facilitate the group's comprehension of the text, while reading extra sections afforded competent readers opportunities to resolve puzzles and effectively promote collective comprehension in discussion.

### *4.2. Meaning construction through group discussion*

At the second stage, students made sense of the text through discussion. They often reported and explained the content of the text following the order of "question", "data", and "answer". Several cognitive and metacognitive strategies were found to be utilized in this process. To obtain information, students raised questions and learned from the explanation offered by the reporter. They orchestrated strategies to tackle comprehension breakdowns and reasoned to construct logical connections between information in different sections. At last, they monitored their understanding to ensure its general accuracy.

#### *4.2.1. Asking and answering questions*

To fill in the information gaps, students frequently asked each other questions and acquired information from the elaborated answers. However, their performance varied in the process. Notably, while S4, S5, and S6 stayed silent occasionally, S1 was always the most active question raiser. S5 reported in the interviews that some questions raised by S1 were exactly the ones she and probably the rest of the members in the group wanted to know. Therefore, whoever raised questions could help every other member obtain information necessary for constructing textual comprehension.

When giving answers, students repeated and explained textual information in Chinese or paraphrased the information in English to offer explanations. This finding is consistent with the findings of Davis, Huang, and Yi's (2017) study, in which students constructed propositional comprehension of science texts, i.e. "accurate literal understanding of the ideas explicitly stated in the text" (p. 243) through self-explanation supported with repeated and paraphrased textual information. However, the differences between this study and their study lie in that students in the present study read different sections and discussed to construct meaning, and therefore, the self-explanation process found in Davis et al.'s (2017) study evolved into other-explanation for shared comprehension in the collaborative context. In addition, instead of literally repeating the textual information, they often repeated it through translating English into Chinese for the convenience of communication. They also questioned by repeating or paraphrasing the information mentioned by others to further check for understanding.

#### *4.2.2. Reasoning*

In discussion, due to information gaps, students often needed to utilize their reasoning ability to construct logical connections between information in different sections. For example, in one discussion, the students concluded through reasoning that "there was a paragraph missing" in the data section. After S4 reported the content in the answer section, they worked out the connection between the data and the answer section. Similarly, Davis, Huang, and Yi (2017) found that the students in their study also employed "self-explanatory reasoning" to "connec[t] ideas across different parts of single texts" (p. 244).

Furthermore, Davis et al. (2017) also found that in addition to propositional understanding, students in their study constructed "situational understanding", "an understanding that integrates propositional representations with prior knowledge and information from other segments of the text" (p. 244). Similarly, one of the CSR studies revealed that students in small groups "helped one another to relate what they were learning to previous knowledge" in science reading (Vaughn et al., 2013, p. 140). In the present study, due to limited content knowledge, students also related the difficult content to their prior knowledge to promote their understanding, as prior knowledge can "supplement information provided by the text" (Davis et al., 2017, p. 229). In Extract 1, to help S1 understand the text, S3 exploited his prior knowledge and compared the mobile money accounts (the specific Kenyan online bank accounts mentioned in the article) to the Alipay accounts, the online accounts familiar to students in the Chinese context. To answer the question raised by S1, S2 further explained why the number of mobile money accounts exceeded bank accounts, which demonstrated the benefits of collaborative reading and discussion – questions from students in discussion could encourage "elaborated student talk" and facilitate "shared reasoning" (Boardman et al., 2018, p. 178).

***Extract 1***:

*S6: Through development, the number of mobile money accounts gradually exceeded that of bank accounts.*

S1: The number of mobile money accounts gradually exceeded that of bank accounts?

*S3: That is, the number of Alipay accounts exceeded bank accounts.*

S1: What does it mean?

*S2: It means that people might not have bank accounts. Maybe there were no banks, but they had phones.*

*S6: Yes.*

#### 4.2.3. Orchestrating strategy use

In the process of information exchange through asking and answering questions, communication breakdowns occurred occasionally when the students failed to understand the section they were assigned to read and were unable to repeat or paraphrase the information for other members to learn about the content in that section. The group leader S3, unanimously acknowledged to be responsible and competent enough to monitor the learning of the group, always orchestrated the use of strategies to tackle communication breakdowns and facilitate the progress of discussion. In such cases, he would invite another member to report the content or interpret for the current reporter who was making confusing remarks. In interviews, the other students appreciated the leader's work because he effectively controlled the pace of discussion. He himself also emphasized the need for someone to monitor the progress, saying that he would do it if no one else did. The group's adjustment of strategy use reflects the advantage of collaboration. Different from our findings, McGrath et al. (2016) found that inexperienced Swedish academic readers with high English proficiency seldom amended unsuccessful strategy use. One possible explanation for the difference might be that academic texts are too difficult to comprehend by novice readers individually, and group collaboration along with the orchestrating of strategy use could effectively facilitate reading comprehension.

#### 4.2.4. Monitoring

The CSR model advocates explicit teaching of the monitoring strategy, which encourages students to identify what they do not understand in reading, and solve the problem using fix-up strategies such as rereading a sentence and those before and after it (Klingner & Vaughn, 1999). In a study of explicit metacognitive strategy instruction for Grade 5 students, Teng (2020) found that the instruction greatly improved the students' awareness to monitor their reading comprehension, indicating the merit of explicit teaching to further enhance strategic awareness. In the present study, however, without explicit instruction, students also employed the monitoring strategy. In particular, the presenter tended to monitor his/her comprehension by seeking confirmation from other group members. For example, S1 was invited to give the presentation twice, on the third and fourth article. She was always concerned about the pronunciation of single words, and often asked for confirmation from other members, because she thought that wrong pronunciation can cause the audience's misunderstanding. She also demonstrated monitoring at the meaning-focused level in the group discussion about the third article (see Extract 2). At the end of the discussion, she repeated in a question the findings of the research article to confirm her understanding. Similarly, in their analysis of think-aloud protocols, Davis et al. (2017) found that students often monitored comprehension of science texts through questioning themselves.

***Extract 2***:

*S1: Does it mean that participants were not happy even if they were not involved in external activities?*

*S2: No external activities. Internal.*

### 4.3. Comprehension modification through collaborative reflection

At the third stage, students proactively learned from other groups' oral presentations to modify their comprehension of the text, and studied outstanding outlines from other groups to improve the formatting of their own outline.

#### 4.3.1. Correcting comprehension mistakes

After listening to other groups' presentations, students sometimes identified and corrected their comprehension mistakes. Although the group considered minor misunderstandings insignificant, they listened to others carefully to improve the accuracy of their comprehension (see Extract 3).

***Extract 3*:**

*S3: Oh, they did use the ship data. They did! It was something about the proportion.*

#### 4.3.2. Improving the formatting of the outline

After all the presentations, students had 5 min to revise their outline and were encouraged to learn from the outlines from other groups. However, students in the focal group reported that they seldom made any changes in the content of their outline, because they believed that it was comprehensive enough and similar to those of other groups, with barely anything to add. They tended not to read other groups' outlines on the blackboard, because they would not bother to make out the messy handwritings. Instead, they observed and learned from the printed-out excellent outlines, which were distributed to them to select the best one at the beginning of each lesson. They gradually learned to use headlines, drawings, and symbols to improve the formatting of their outline, because they helped visualize the information and beautify the outline. Although they were concerned mainly about the format, the organization of the content was significantly improved with the use of headlines. The headlines grouped the information into different logically connected units and thereby formed a coherent outline (see Fig. 3).

Therefore, the study demonstrated that the three-stage teaching method provided students with opportunities to learn from not only their own group but also other groups, which further enhanced the benefits of collaborative reading.

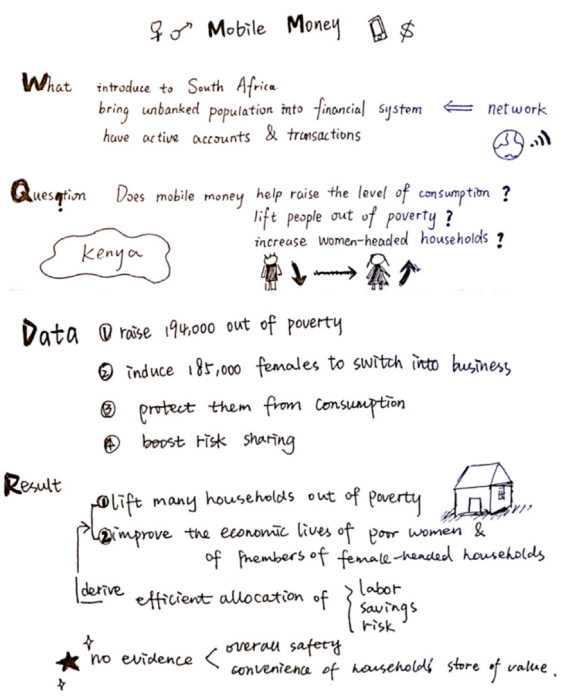


**Fig. 3.** Outline of the fourth research article.

### *4.4. Limitations perceived by students*

In interviews, students pointed out two limitations of this teaching method. First, as the length of the three sections of a text often varied, students assigned to read the longest section at the individual reading stage tended to face more difficulties. Second, although every two students read the same section, it was usually one of them that reported the content to other group members in group discussions. Those who had limited confidence in English or reading proficiency often kept silent. They reported in interviews that they had relied on their peers to share the content they were assigned to cover, which they perceived as a disadvantage of pairing.

## 5. Implications for teaching practice

Based on the CSR model (Boardman et al., 2018; Klingner & Vaughn, 1999), this study developed a three-stage teaching method to help first-year novice academic readers comprehend academic texts through collaboration. Both the CSR and the three-stage teaching method can effectively engage students in text-based discussion. As noted above in Section 4.2, the collaborative contexts provided opportunities for students to raise authentic questions derived from texts, to engage in "elaborated student talk" to explain, analyze, and further question, and to employ "shared reasoning" to make sense of texts (Boardman et al., 2018, p. 178). A significant difference between the two teaching methods is the roles of teachers. In CSR classes, teachers follow the strategy instruction routine and explicitly teach the four reading strategies mentioned above. Therefore, guidance from teachers play a key role in promoting reading comprehension. In the three-stage teaching method, however, the teacher only offers general guidelines to facilitate task progression without leading student discussion. We found that even without much help from the teacher, students adopted various strategies to make sense of the academic articles and worked out good summaries.

The finding that the three-stage teaching method activated the students' effective use of strategies suggests its potential to be applied in similar contexts and further developed in future research. However, several limitations need to be considered for classroom application and further development. First, since the teacher did not specify a repertoire of strategies for students to use, strategies elicited from students might not be effective. For example, adopting a fixed pattern of labor division at the individual reading stage proved to be an ineffective strategy, as shown in Section 4.1. Furthermore, the preparation of reading materials and pairing of reading peers tended to pose challenges. No matter how a text is divided, it is hardly possible to ensure equal degree of difficulty and length of different sections, as also noted by students in interviews. With regard to pairing students, the CSR modal holds that placing students with varied reading abilities in the same group is crucial for successful group collaboration, because it encourages proficient readers' "teacher" behaviors and promotes all members' comprehension (Vaughn et al., 2013, p. 159). However, the present study shows that pairing students in this way may hinder some students' development of reading and cooperation competence, for they may overly depend on peers. To deal with

these challenges, it is essential to appropriately assign the reading materials and divide the labor for reading. One possible solution is to assign the reading materials and pair students randomly. The random assigning of reading materials can help break the fixed pattern of labor division, compelling students to read different sections of the articles with various length throughout the semester. The random pairing of students can reduce their excessive reliance on peers. Future research may investigate how to pair reading peers to maximize the effectiveness of collaborative reading, and further enhance the efficacy of the three-stage teaching method in the EAP context and beyond.

## CRediT authorship contribution statement

**Tan Jin:** Conceptualization, Methodology, Investigation, Writing - review & editing. **Xiaoling Liu:** Methodology, Data curation, Writing - review & editing. **Jun Lei:** Methodology, Writing - review & editing.

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